

STRUCTURAL NOTES

(REFER TO PROJECT MANUAL FOR ADDITIONAL INFORMATION)

A1

1. FOOTINGS & FOUNDATION EXCAVATION

- A. A GEOTECHNICAL ANALYSIS HAS BEEN PERFORMED ON THIS SITE. SEE PROJECT MANUAL FOR GEOTECHNICAL INFORMATION. APPROPRIATE RECOMMENDATIONS STATED IN THE GEOTECHNICAL REPORT ISSUED BY ECS SOUTHEAST, LLP DATED JANUARY 25, 2019 SHALL BE FOLLOWED.
- B. THESE FOUNDATIONS HAVE BEEN DESIGNED FOR A SOIL BEARING OF 2000 PSF FOR CONTINUOUS AND ISOLATED FOOTINGS.
- C. FOUNDATIONS AND SLAB SHOULD BEAR ON APPROVED NATURAL SOILS OR ON PROPERLY PLACED AND COMPACTED ENGINEERED FILL. SEE GEOTECHNICAL REPORT FOR SPECIFIC REQUIREMENTS REGARDING EXCAVATION AND PREPARATION OF SUBGRADE. A GEOTECHNICAL ENGINEER SHOULD BE PRESENT TO DIRECT THE REMOVAL OF UNSUITABLE SOILS AND TO DETERMINE THE ADEQUACY OF THE BEARING SURFACE PRIOR TO PLACEMENT OF THE REINFORCEMENT AND CONCRETE.
- D. FOOTING WIDTHS TO BE AS SHOWN ON PLANS AND DETAILS. BOTTOM OF FOOTING IS TO BE EXCAVATED SQUARE AND TRUE.
- E. WHERE ANY OPEN TRENCH HAS BEEN EXPOSED TO RAIN, SNOW OR ICE PRIOR TO POURING CONCRETE, ALL REINFORCING IN THAT TRENCH SHALL BE REMOVED AND THE BOTTOM OF THE TRENCH SHALL BE DRAINED OF ALL WATER AND CLEANED OF MUD, SNOW OR ICE. A GEOTECHNICAL ENGINEER OR HIS TECHNICAL REPRESENTATIVE SHALL INSPECT THE BOTTOM OF THE TRENCH AND OBSERVE THE RE-COMPACTING OF SOILS PRIOR TO PLACING REINFORCEMENT AND POURING OF CONCRETE.
- F. ALL STRIP FOOTINGS SHALL BE CENTERED UNDER WALLS BEING SUPPORTED AND ALL ISOLATED FOOTINGS SHALL BE CENTERED UNDER COLUMNS, UNLESS NOTED OTHERWISE.
- G. MINIMUM EXTERIOR FOOTING DEPTH SHALL BE AS INDICATED ON THE FOUNDATION PLAN SHEET S2.
- H. IN THE EVENT THAT ORGANIC SOIL OR UNCOMPACTED FILL IS FOUND BELOW FOOTINGS OR FLOOR SLABS, IT SHALL BE REMOVED AND REPLACED WITH SELECT FILL, PLACED AND COMPACTED AS DESCRIBED IN THE GEOTECHNICAL REPORT.
- I. STRUCTURAL FILL SHOULD BE PLACED AND COMPACTED AS INDICATED IN THE GEOTECHNICAL REPORT. ADEQUATE DENSITY AND MOISTURE CONTENT TESTS SHOULD BE PERFORMED TO INSURE COMPLIANCE WITH PROJECT SPECIFICATIONS. SUBGRADE INSPECTION AND FILL TESTING UNDER CONTROLLED CONDITIONS IS CONSIDERED ESSENTIAL IF THE FOOTINGS ARE TO BE FOUND IN FILL. A TESTING FREQUENCY OF AT LEAST ONE FIELD DENSITY TEST FOR EACH 2500 SQUARE FEET OF LIFT, BUT NOT LESS THAN 3 TESTS PER LIFT IS RECOMMENDED WITHIN THE BUILDING AREAS.

2. CONCRETE

- A. ALL READY MIX CONCRETE SHALL BE 4000 PSI FOR ALL CONCRETE PLACEMENT. DO NOT ADD WATER TO THE MIX DESIGN AFTER DELIVERY TO THE PROJECT SITE.
- B. EXPOSED EXTERIOR CONCRETE SHALL BE AIR-ENTRAINED (TOTAL AIR CONTENT = 5%). INTERIOR CONCRETE SHALL NOT BE AIR-ENTRAINED.
- C. UNLESS NOTED OTHERWISE, CONCRETE COVER FOR STEEL REINFORCEMENT SHALL CONFORM TO ACI 308.
- D. REINFORCEMENT DETAILING AND PLACEMENT SHALL CONFORM TO ACI 308 AND ACI 315, EXCEPT WHERE OTHERWISE INDICATED.
- E. HOT OR COLD WEATHER CONCRETING SHALL BE IN ACCORDANCE WITH ACI 305-89 AND ACI 306-1-90, RESPECTIVELY.
- F. ANY CONCRETE PLACED BY MEANS OF PUMPING SHALL BE DONE IN ACCORDANCE WITH ACI 304.2R-82.
- G. CEMENT SHALL CONFORM TO ASTM C-150 TYPE I.
- H. AGGREGATES SHALL CONFORM TO ASTM C-33 FOR NORMAL WEIGHT CONCRETE & ASTM C-330 FOR LIGHTWEIGHT CONCRETE.
- I. ADMIXTURES SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH ASTM C-84.
- J. ADMIXTURES MAY BE USED WITH THE APPROVAL OF THE STRUCTURAL ENGINEER. ADMIXTURES USED TO INCREASE THE WORKABILITY OF THE CONCRETE SHALL NOT BE CONSIDERED TO REDUCE THE CEMENT CONTENT. NO CALCIUM CHLORIDE ADMIXTURES ALLOWED.

3. SLABS ON GRADE

- A. FLOOR SLABS ARE TO BE PLACED AND FINISHED IN ACCORDANCE WITH ACI 302 (SEE PROJECT MANUAL FOR ADDITIONAL INFORMATION).
- B. THICKNESS TOLERANCE FOR ALL SLABS IS TO BE PER ACI 117 AND IS TO BE NO MORE THAN $\pm 3/8$ " (THICKER) AND NO MORE THAN $-1/2$ " (THINNER) FROM THE DESIGN THICKNESS.
- C. CONCRETE USED FOR FLOOR SLABS SHALL INCLUDE SUPERPLASTICIZER. SEE PROJECT MANUAL FOR ADDITIONAL INFORMATION.

4. REINFORCEMENT

- A. REINFORCING BARS SHALL BE BILLET STEEL, ASTM A 615, GRADE 60. PROVIDE CONTINUOUS BENT BARS AT FOOTING STEPS AND 90 DEGREE BENDS AT CORNERS UNLESS OTHERWISE NOTED. LAP SPLICES OR EMBEDMENT LENGTHS SHALL CONFORM TO CLASS B SPLICE (SEE SPLICE TABLE). ADJACENT BAR SPLICES IN WALLS AND FOOTINGS TO BE ALTERNATED.

5. LUMBER

- A. TREATED LUMBER IN LOCATIONS WHERE TREATED LUMBER IS SHOWN ON DRAWINGS, THE APPROVED PRESSURE TREATED WOODS ARE ACQ-CARBONATE OR CA-B TREATED WOODS WITHOUT AMMONIA CARRIERS. THE CHEMICAL RETENTION LEVELS ARE TO BE NOT GREATER THAN 0.21 PCF FOR ACQ AND 0.21 PCF FOR CA-B. ALL METAL CONNECTORS ARE TO HAVE A GALVANIZED COATING OF NO LESS THAN 1.85 OUNCES OF ZINC PER SQUARE FOOT PER ASTM A563. NAILS, SCREWS, NAILS AND OTHER FASTENERS ARE TO BE GALVANIZED PER ASTM A153. WHERE TREATED LUMBER IS SHOWN IN EXTERIOR INSTALLATIONS WITH NO ROOF COVERING, PROVIDE DIRECT EXPOSURE TO RAIN, USE HOT DIP GALVANIZED CONNECTORS PER ASTM A123.

6. STRUCTURAL STEEL

- A. FABRICATOR QUALIFICATIONS: FABRICATOR MUST PARTICIPATE IN THE AISC QUALITY CONTROL PROGRAM AND BE DESIGNATED AN AISC-CERTIFIED PLANT.
- B. PRE-ENGINEERED METAL BUILDING SHOP DRAWINGS ARE TO BE SUBMITTED TO ENGINEER FOR REVIEW PRIOR TO FABRICATION.

C. MATERIALS

STRUCTURAL STEEL	A992, GRADE 50 UNLESS NOTED
PLATES, ANGLES, CHANNELS, AND MISCELLANEOUS STEEL	ASTM A36
ANCHOR RODS	ASTM F1554, GRADE 36
HIGH STRENGTH BOLTS	ASTM A325 (N ^A)
WELDING ELECTRODES	AWS A51 (E70XX)
PIPE	ASTM A53, GRADE B
SQUARE AND RECTANGULAR HOLLOW SECTION (HSS)	ASTM A500, GRADE B

7. LIGHT GAUGE STEEL

- A. ALL LIGHT GAUGE METAL STUDS, TRACKS, JOISTS, AND CEILINGERS ARE TO MEET OR EXCEED INDUSTRY STANDARDS AS SET FORTH BY THE STEEL STUDS MANUFACTURER'S ASSOCIATION (SSMA).
- B. LIGHT GAUGE STEEL MEMBER DESIGNATIONS SHOWN ON THE CONSTRUCTION DOCUMENTS ARE SSMA STANDARD DESIGNATIONS.
- C. EXTERIOR LIGHT GAUGE STEEL WALLS SHALL BE LATERALLY BRIDGED AT 48" O.C. (VERTICALLY) USING 2"x20g0 STRAP BRACING ATTACHED TO EACH STUD FLANGE. SOLID BRACING WITHIN THE PLANE OF THE STRAP BRACING MUST BE PROVIDED AT EACH END OF WALL, ADJACENT TO WALL OPENINGS, AND AT 8' O.C. MAXIMUM ALL BRIDGING AND BRACKETS TO BE POSITIVELY CONNECTED TO STUDS.
- D. TRACKS AND CEILINGERS NOT EXCEED GAUGE OF SUPPORTED STUDS.
- E. BOTTOM TRACK FASTENERS TO BE SPACED AT EACH END OF WALL, ADJACENT TO WALL OPENINGS, AND AT 48" O.C. MAXIMUM.
- F. PULVERULENT FASTENERS SHALL BE DS HEAVY DUTY 0.177x1x1/8" LONG MANUFACTURED FROM MODIFIED AISI 1061 STEEL ALUMINUM TEMPERED TO A HARDNESS OF 52-56 HRC AND PLATED IN ACCORDANCE WITH ASTM B633, TYPE II. FASTENERS SHALL BE INSTALLED BY A QUALIFIED OPERATOR IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. POWDER ACTUATED FASTENERS SHALL BE AS MANUFACTURED BY "MULTI FASTENING SYSTEMS" OR EQUIVALENT.
- G. ALL LOAD BEARING STUDS TO BE SEATED SQUARELY INTO TOP AND BOTTOM WALL TRACKS WITH NO MORE THAN A 1/8" GAP.
- H. THE DESIGN OF SLIP TRACKS SHALL CONFORM TO THE GUIDELINES ESTABLISHED IN SSMA TECHNICAL NOTE NO. 1 PUBLISHED JANUARY, 2001.

8. GENERAL

- A. CONTRACTOR HAS SOLE RESPONSIBILITY TO COMPLY WITH ALL OSHA REGULATIONS.
- B. THE STRUCTURAL DESIGN OF THE BUILDING IS BASED UPON THE FULL INTERACTION OF ALL ITS COMPONENT PARTS, WITH NO PROVISION MADE FOR CONDITIONS OCCURRING DURING CONSTRUCTION. THE STRUCTURE IS STABLE ONLY IN ITS COMPLETED FORM. THE CONTRACTOR SHALL PROVIDE ADEQUATE BRACING DURING CONSTRUCTION. TEMPORARY SUPPORTS REQUIRED FOR STABILITY DURING ALL INTERMEDIATE STAGES OF CONSTRUCTION SHALL BE DESIGNED, FURNISHED AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION ANALYSIS AND ERECTION PROCEDURES, INCLUDING DESIGN AND ERECTION OF FALSEWORK, TEMPORARY BRACING, ETC. THE STRUCTURAL ENGINEER ASSUMES NO LIABILITY FOR THE STRUCTURE DURING CONSTRUCTION.
- C. CORRECTIONS DUE TO UNFORESEEN FIELD CONDITIONS, MISLOCATION OF ANCHOR BOLTS, OR DIMENSIONAL DISCREPANCIES ON CONSTRUCTION DOCUMENTS MUST BE BROUGHT TO THE ATTENTION OF THE PROJECT ARCHITECT FOR REVIEW AND AUTHORIZATION PRIOR TO CORRECTIVE MEASURES BEING IMPLEMENTED.
- D. STRUCTURAL DRAWINGS ARE TO BE USED IN CONJUNCTION WITH ARCHITECTURAL, MEP, CIVIL, AND PRE-ENGINEERED METAL BUILDING DRAWINGS.
- E. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.
- F. ALL SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY THE PROJECT ARCHITECT/ENGINEER PRIOR TO SUBMITTING TO THE BUILDING DEPARTMENT FOR REVIEW AND APPROVAL.

9. SIMPSON AT-XP ADHESIVE SYSTEM (CONCRETE LAP JOINTS FR-283) (MASONRY MEMO ES-205)

- A. CONTRACTOR TO FOLLOW ALL REQUIREMENTS, INSTRUCTIONS, AND RECOMMENDATIONS FOR ADHESIVE APPLICATION.
- B. ADHESIVE CONNECTIONS ARE DESIGNED IN ACCORDANCE WITH CODIFIED PROCEDURES, USING CAPACITIES SPECIFIC TO SIMPSON AT-XP. SUBSTITUTION OF ANCHOR ADHESIVE AT STRUCTURAL CONNECTIONS IS NOT ALLOWED WITHOUT PRIOR APPROVAL BY THE PROJECT ENGINEER OF RECORD.

10. SPECIAL INSPECTIONS REQUIREMENTS

- A. OWNER SHALL ENGAGE ONE OR MORE QUALIFIED SPECIAL INSPECTORS AND/OR TESTING AGENCIES TO CONDUCT STRUCTURAL TESTS, CONSTRUCTION MATERIAL TESTING, AND SPECIAL INSPECTIONS SPECIFIED IN THE "STATEMENT OF SPECIAL INSPECTIONS".
- B. FOR SPECIFIC RESPONSIBILITIES OF THE OWNER, CONTRACTOR, AND INSPECTOR REFER TO SECTION 01-45-16 OF THE PROJECT MANUAL.

DESIGN CRITERIA

BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE

DESIGN LOADS:

ROOF DEAD LOAD	6.0 psf
ROOF COLLATERAL LOAD	2.5 psf
ROOF LIVE LOAD	20.0 psf
SPRINKLER BRANCH PIPE LOAD	0.0 psf
LINEAL LOOP/TEE MAIN PIPE LOAD	0.0 psf

SNOW LOAD:

$$P_s = 0 \text{ psf}$$

$$P_f = 0 \text{ psf}$$

$$C_e = 1.0$$

$$C_t = 1.0$$

IMPORTANCE FACTOR = 1.0

WIND CALCULATION METHOD: ENVELOPE

$$\text{WIND SPEED } V_{ult} = 157 \text{ mph} \quad \text{REF } = 121.6 \text{ mph}$$

$$\text{EXPOSURE} = "C"$$

$$\text{RISK CATEGORY} = "II"$$

$$\text{BUILDING ENCLOSED } C_{ep} = 0.18$$

MAIN FORCE RESISTING SYSTEM:

$$\text{WALL AREA ROOFS } q = 27 \text{ psf}$$

$$\text{PARAPETS } q_p = 25.2 \text{ psf}$$

WIND COMPONENTS & CLADDING: All Wind Pressures & Forces in "ASD"

(Wind pressures were used by JS Smith Consulting Engineers, P.C. for design of the exterior walls. Components designed by others for use in this project will require wind pressures derived by that supplier.)

WALL AREAS 10 SQUARE FEET OR LESS	= 39.3 psf
WALL INTERIOR ZONES	= 24.0 psf & -27.0 psf
WALL END ZONES	= 24.0 psf & -28.2 psf
PARAPETS AT INTERIOR ZONES	= 21.8 psf & -35.8 psf
PARAPETS AT END ZONES	= 21.8 psf & -43.0 psf
ROOF INTERIOR ZONES	= 10.4 psf & -29.5 psf
ROOF EDGE ZONES	= 10.4 psf & -35.0 psf
ROOF CORNER ZONES	= 10.4 psf & -35.0 psf

BASE SHEAR:

$$V_w \text{ WIND} = 32.8 \text{ k}$$

$$\text{SEISMIC} = 3.1 \text{ k}$$

$$V_w \text{ WIND} = 22.4 \text{ k}$$

$$\text{SEISMIC} = 3.1 \text{ k}$$

SEISMIC DESIGN: EQUIVALENT FORCE PROCEDURE

$$S_s = 0.091$$

$$S_1 = 0.054$$

$$S_{ps} = 0.097$$

$$S_{ps} = 0.086$$

$$\text{SITE CLASS} = "D"$$

$$\text{SEISMIC DESIGN CATEGORY} = "B"$$

$$I_e = 1.0$$

SEISMIC FORCE RESISTING SYSTEM:

$$\text{STEEL NOT DETAILED FOR SEISMIC}$$

$$R = 3.00$$

$$C_d = 0.032$$

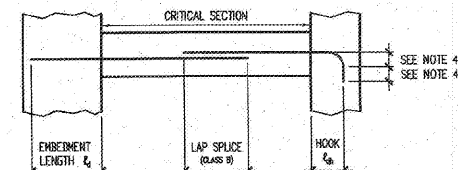
$$p = 1.00$$

SPLICE TABLE¹

(UNLESS NOTED OTHERWISE)

BAR SIZE	LAP SPLICES (in.) ²		EMBED LENGTH (in.)		
	TOP BARS ³ Class B	OTHERS Class B	TOP BARS ⁴ l _d	OTHERS l _d	HOOKS ⁵ l _{ch}
#3	25	19	19	15	8
#4	33	25	25	19	10
#5	41	31	31	24	12
#6	49	37	37	29	15
#7	71	54	54	42	17

1. SPLICE TABLE IS BASED ON THE FOLLOWING:
 - A. CONCRETE $f_c = 4000$ psi
 - B. GRADE 60 REBAR
 - C. BAR SPACING NOT LESS THAN 2 BAR DIAMETERS OR 1"
 - D. CONCRETE COVER NOT LESS THAN ONE BAR DIAMETER
2. LAP LENGTHS SHOWN ARE FOR CLASS "B" TENSION SPLICES PER ACI 318-11 CHAPTER 12.
3. TOP BARS ARE DEFINED AS HORIZONTAL REINFORCEMENT PLACED SO THAT MORE THAN 12" OF CONCRETE IS CAST BELOW THE REINFORCEMENT IN THAT MEMBER.
4. STANDARD 90° HOOKS:
 - A. RADIUS = 4 BAR DIAMETERS FOR #3 THRU #8
 - B. LENGTH = 12 BAR DIAMETERS
 - C. HOOK LENGTH MAY BE REDUCED IN ACCORDANCE WITH ACI 318-11 CHAPTER 12.5



Order Plans @



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DRAWN BY: BTJ
 CHECKED BY: AS
 DATE: 9/28/18
 REVISION: A1
 ADDENDUM #1
 02/08/2019
 PROJECT NUMBER:
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 SHEET NUMBER:

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