

GENERAL NOTES

- THE CONTRACTOR AND HIS SUBCONTRACTORS AGREE THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR AND HIS SUBCONTRACTORS SHALL BE RESPONSIBLE FOR ASSUMING SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
- SITE REVIEW OF THE CONSTRUCTION BY THE ENGINEER IS TO DETERMINE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. IT DOES NOT ENCOMPASS SAFETY PROCEDURES OR OPERATIONS.
- THE CONTRACTOR AND HIS SUBCONTRACTORS FURTHER AGREE TO DEFEND, INDEMNIFY, AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
- THE CONTRACTOR SHALL VERIFY ALL LAYOUTS, DIMENSIONS, ELEVATIONS AND CONDITIONS DEPICTED ON THE STRUCTURAL DRAWINGS PRIOR TO ORDERING ANY MATERIALS AND PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES, PRIOR TO PROCEEDING WITH WORK.
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE STRUCTURAL DRAWINGS AND SPECIFICATIONS, THE CURRENT BUILDING CODE, AND ACCEPTED STANDARDS OF PRACTICE.
- THESE GENERAL NOTES, SPECIFICATIONS, AND TYPICAL DETAILS SHALL APPLY TO ALL STRUCTURAL DRAWINGS UNLESS OTHERWISE NOTED OR SHOWN. SPECIFIC NOTES SHOWN ON THE STRUCTURAL DRAWINGS TAKE PRECEDENCE OVER THESE GENERAL NOTES, SPECIFICATIONS AND TYPICAL DETAILS.
- FEATURES OF CONSTRUCTION SHOWN ARE TYPICAL AND SHALL APPLY GENERALLY THROUGHOUT SIMILAR CONDITIONS.
- BEAMS, JOISTS AND OTHER STRUCTURAL ELEMENTS SHALL NOT BE CUT OR PENETRATED, EXCEPT AS SHOWN ON STRUCTURAL DETAILS OR SPECIFICALLY APPROVED BY THE ENGINEER. NO OVER CUTTING IS ALLOWED FOR CUTS OR PENETRATIONS OF STRUCTURAL ELEMENTS.
- STRUCTURES DESIGNED FOR OPERATIONAL LOADS ON THE COMPLETED STRUCTURES. DURING CONSTRUCTION, BRACING OR SHORING SHALL SUPPORT STRUCTURES WHEREVER EXCESSIVE CONSTRUCTION LOADS MAY OCCUR. BRACING AND SHORING REQUIREMENTS SHALL BE ACCEPTABLE TO THE ENGINEER OF RECORD.

CODE AND LOADS

2013 CALIFORNIA BUILDING CODE (CBC)
ASCE 7-10

SEISMIC: RISK CATEGORY III, *I_s* = 1.25
SITE CLASS D, SEISMIC DESIGN CATEGORY D
S_s = 1.448 *S₁* = 0.703
S_{DS} = 0.965 *S_{1S}* = 0.703

EQUIVALENT LATERAL FORCE PROCEDURE

R = 6 (SPECIAL CONCENTRIC BRACED FRAMES)
D_s = 2
C_e = 5
V = *C_a**W* = 0.161*W*

WIND: RISK CATEGORY III, *I_s* = 1.0
BASIC SPEED: *V_{bst}* = 85 mph
V_{st} = 110 mph

EXPOSURE: D

STRUCTURE DESIGN VERTICAL LOADS:
ROOF: 25 PSF (D)¹
20 PSF (RL)

FLOOR: 61 PSF (D)²
20 PSF (PARTITION)
100 PSF (L) (PUBLIC)

* THESE LOADS ARE BASIC AND DO NOT INCLUDE BEAM SELF WEIGHTS, AND OTHER LOADS SUCH AS CONCENTRATED MECHANICAL EQUIPMENT, ETC.

NOTE: THIS DESIGN IS FOR A STRUCTURAL REINFORCED CONCRETE MAT SLAB FOUNDATION ONLY.
SEE URS DRAWINGS FOR THE DESIGN OF THE STRUCTURE ABOVE THE FOUNDATION.

SUBMITTALS

CONTRACTOR SHALL SUBMIT FOR REVIEW BY THE STRUCTURAL ENGINEER, THE FOLLOWING:

- MIX DESIGNS FOR ALL CONCRETE WORK
- REINFORCING STEEL SHOP DRAWINGS
- REINFORCING STEEL TAGS STATING MATERIAL SPECIFICATION
- STRUCTURAL STEEL SHOP DRAWINGS
- WELDING PROCEDURE SPECIFICATIONS

SUBMIT TWO COPIES FOR REVIEW. ORDERING OF MATERIALS, FABRICATION, OR ANY RELATED WORK SHALL NOT PROCEED UNTIL SUBMITTALS HAVE BEEN STAMPED APPROVED BY THE ENGINEER AND BUILDING DEPARTMENT APPROVAL HAS BEEN OBTAINED.

BRACING & SHORING

- THE STABILITY AND INTEGRITY OF THE STRUCTURE, DURING CONSTRUCTION, SHALL BE MAINTAINED AT LEVELS GENERALLY ACCEPTABLE WITHIN THE CONSTRUCTION INDUSTRY BY THE USE OF BRACING, SHORING AND UNDERPINNING UNTIL THE PROPOSED STRUCTURE IS COMPLETED. IN NO CASE SHALL THE STRUCTURE, OR ANY PORTION OF IT, BE ALLOWED TO BECOME UNSAFE DURING CONSTRUCTION.
- THE BRACING AND SHORING SYSTEMS REQUIRED TO PROVIDE TEMPORARY SUPPORT OF THE STRUCTURE DURING CONSTRUCTION SHALL BE DESIGNED TO SUPPORT THE DEAD, LIVE, SOIL, EARTHQUAKE AND WIND LOADS THAT MAY BE IMPOSED ON THE STRUCTURE DURING CONSTRUCTION. THE DESIGN SHALL BE IN ACCORDANCE WITH INDUSTRY STANDARDS AND GENERALLY ACCEPTED ENGINEERING PRINCIPLES.
- THE CONTRACTOR SHALL SUBMIT PROPOSED SHORING, BRACING AND UNDERPINNING SYSTEMS TO THE ENGINEER FOR REVIEW. THE SUBMITTAL WILL BE REVIEWED ONLY IN SO FAR AS THE DETAILS AFFECT THE CHARACTER OF THE FINISHED WORK. BUT THE DETAILS OF DESIGN WILL BE LEFT TO THE CONTRACTOR WHO SHALL BE RESPONSIBLE FOR THE SUCCESSFUL COMPLETION OF THE WORK.
- NO CONSTRUCTION OF THE BRACING, SHORING OR THE UNDERPINNING SYSTEMS, OR ORDERING MATERIALS SHALL TAKE PLACE UNTIL THE CONTRACTOR HAS RECEIVED REVIEWED SUBMITTALS BY THE ENGINEER.
- THE SUBMITTALS SHALL SHOW LAYOUT, SIZE OF MEMBERS, CONNECTION DETAILS AND CONSTRUCTION SEQUENCE FOR ALL BRACING AND SHORING SYSTEMS. THE SUBMITTALS SHALL BE ACCOMPANIED BY STRUCTURAL CALCULATIONS SIGNED BY A REGISTERED CIVIL ENGINEER OF THE STATE OF CALIFORNIA.
- FOLLOWING COMPLETION OF REVIEW BY THE ENGINEER OF RECORD AND INCORPORATION OF REVIEW COMMENTS INTO THE SUBMITTALS, THE PLANS AND CALCULATIONS SHALL BE SUBMITTED TO THE BUILDING DEPARTMENT FOR REVIEW AND APPROVAL. INCLUDED IN THIS SUBMITTAL SHALL BE A LETTER FROM THE ENGINEER OF RECORD INDICATING THAT THE SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN GENERAL CONFORMANCE WITH THE DESIGN PLANS AND SPECIFICATIONS.

SPECIAL INSPECTIONS

ALL STRUCTURAL AND EARTHWORK INSPECTIONS SHALL MEET THE REQUIREMENTS OF THE CURRENT BUILDING CODES AND LOCAL ORDINANCES. THE OWNER OR THE ENGINEER OF RECORD ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS WHO SHALL PROVIDE INSPECTIONS DURING CONSTRUCTION ON THE FOLLOWING TYPES OF WORK:

SPECIAL GRADING, EXCAVATIONS AND FILLING
DURING EARTHWORK EXCAVATIONS, GRADING AND FILLING OPERATIONS PER CBC TBL 1705.6.
OBSERVATION IS REQUIRED BY THE GEOTECHNICAL ENGINEER AS DETAILED IN "FOUNDATIONS & BUILDING PADS" NOTE, THIS SHEET, AND PER CITY RESOLUTION # 09-2004.

REINFORCING STEEL
PERIODICALLY INSPECT REINFORCING STEEL AND PLACEMENT IN ACCORDANCE WITH CBC TBL 1705.3.

- VERIFY THAT MILL CERTIFICATES MATCH PROJECT SPECIFICATIONS.
- PERIODICALLY INSPECT REINFORCING STEEL PLACEMENT FOR CONCRETE WHICH IS REQUIRED TO HAVE CONTINUOUS INSPECTION.
- CONTINUOUSLY INSPECT THE INSTALLATION OF ALL MECHANICAL COUPLING DEVICES.

BOLTS CAST IN CONCRETE
PERIODICALLY INSPECT INSTALLATION OF BOLTS AND PLACEMENT OF CONCRETE AROUND BOLTS IN ACCORDANCE WITH CBC TBL 1705.3.

CONCRETE
CONTINUOUSLY INSPECT THE PLACEMENT OF ALL CONCRETE IN ACCORDANCE WITH CBC TBL 1705.3, EXCEPT PERIODIC INSPECTION MAY BE PROVIDED FOR THE PLACEMENT OF CONCRETE FOR:

- FOUNDATIONS WITH *f'_c* LESS THAN OR EQUAL TO 2500 PSI
 - NON-STRUCTURAL SLAB-ON-GRADE
- SAMPLE CONCRETE: ASTM C172 - EXCEPT SLUMP SHALL COMPLY WITH ASTM C94.
 - SLUMP: ASTM C143 - ONE TEST AT POINT OF TRUCK DISCHARGE FOR 50 CY OR FRACTION THEREOF FOR EACH TYPE OF CONCRETE; ADDITIONAL TESTS REQUIRED WHEN CONCRETE CONSISTENCY APPEARS TO HAVE CHANGED.
 - AIR CONTENT: ASTM C173 - VOLUMETRIC METHOD FOR NORMAL WEIGHT CONCRETE, ONE FOR EACH 50 CY PLACED OR FRACTION THEREOF FOR EACH TYPE OF AIR-ENTRAINED CONCRETE.
 - CONCRETE TEMPERATURE: TEST HOURLY WHEN AIR TEMPERATURE IS 50 DEGREES F, (10 DEGREES C), AND BELOW, AND WHEN 85 DEGREES F, (29 DEGREES C) AND ABOVE, AND EACH TIME A SET OF COMPRESSION TEST SPECIMENS ARE MADE.
 - COMPRESSION TEST SPECIMENS: ASTM C31 - TAKE (1) SET OF (3) STANDARD CYLINDERS FOR EACH 150 CY OF CONCRETE OR 5000 SF OF SLABS AND WALLS OR FRACTION THEREOF FOR EACH TYPE OF CONCRETE TAKEN EACH DAY, AND ONE (1) STORE CYLINDERS FOR LABORATORY CURED TEST SPECIMENS EXCEPT WHEN FIELD-CURE TEST SPECIMENS ARE REQUIRED.
 - COMPRESSIVE STRENGTH: ASTM C39 - ONE SPECIMEN TESTED AT 7 DAYS. TWO SPECIMENS TESTED AT 28 DAYS.

POST INSTALLED ANCHORS IN CONCRETE

- ADHESIVE ANCHORS SYSTEMS**
CONTINUOUSLY INSPECT DURING SETUP AND INSTALLATION OF ADHESIVE ANCHORS SYSTEMS IN ACCORDANCE WITH CBC TBL 1705.3 AND ICC ESR-2508.
- CONCRETE SCREW ANCHOR**
PERIODICALLY INPECT DURING SETUP AND INSTALLATION OF CONCRETE SCREW TYPE ANCHORS IN ACCORDANCE WITH CBC TBL 1705.3 AND ICC-ES ESR-2713

NON-SHRINK GROUT

CONTINUOUSLY INSPECT THE PLACEMENT OF NON-SHRINK GROUT.

STRUCTURAL STEEL AND MISCELLANEOUS IRON

SPECIAL INSPECTION FOR STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF AISC 360.
SPECIAL INSPECTION FOR STRUCTURAL STEEL MEMBERS AND CONNECTIONS THAT ARE PART OF THE LATERAL FORCE RESISTING SYSTEM SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE REQUIREMENTS OF AISC 341
VERIFY THAT MILL CERTIFICATES SHOW STRUCTURAL STEEL AND MISCELLANEOUS IRON IS IN COMPLIANCE WITH PROJECT SPECIFICATIONS.

HIGH STRENGTH BOLTING

- PRIOR TO BOLTING OPERATIONS:
- VERIFY THAT MANUFACTURER'S CERTIFICATE OF COMPLIANCE FOR BOLTS, NUTS AND WASHERS MEETS THE PROJECT SPECIFICATIONS.
 - VERIFY THAT THE METHODS OF TIGHTENING TO BE USED BY THE CONTRACTOR COMPLY WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" - CURRENT EDITION.
 - PERFORM TENSION CALIBRATION TESTS WITH THE CONTRACTOR'S TOOLS ON 3 BOLT ASSEMBLIES FOR EACH DIAMETER, LENGTH, GRADE, PRODUCTION LOT, AND TIGHTENING METHOD TO BE USED ON THE PROJECT INCLUDING PRETENSIONED ANCHOR RODS. TESTS SHALL BE PER AISC SPECIFICATIONS.
 - DURING BOLTING OPERATIONS:

- VERIFY THAT ALL PLIES OF CONNECTED MATERIAL HAVE BEEN DRAWN TOGETHER TO A SNUG CONDITION AS DEFINED PER AISC SPECIFICATIONS BEFORE FINAL TIGHTENING.
- VERIFY PLACEMENT OF MATCH-MARKS OR WRENCH CALIBRATION AS REQUIRED. CONTINUOUSLY INSPECT FINAL TIGHTENING OPERATIONS PER AISC SPECIFICATIONS.
- EXCEPTION: THE SPECIAL INSPECTOR NEED NOT BE PRESENT DURING ALL FINAL TIGHTENING OPERATIONS PROVIDED IT CAN BE VERIFIED THAT PROPER PROCEDURES WERE FOLLOWED, (I.E. THE USE OF DTIs, "TWIST-OFF" TYPE BOLTS OR MATCH MARKING).

WELDING

- WELDING INSPECTION SHALL BE IN COMPLIANCE WITH AWS D1.1. THE BASIS FOR WELDING INSPECTION QUALIFICATIONS SHALL BE AWS D1.1. VERIFY MATERIALS, WELDING PROCEDURES AND QUALIFICATIONS OF WELDERS PRIOR TO THE START OF THE WORK.
- CONTINUOUSLY INSPECT ALL STRUCTURAL WELDING, INCLUDING WELDING OF REINFORCING STEEL. EXCEPTIONS:

 - SINGLE PASS FILLET WELDS NOT EXCEEDING 5/16" MAY HAVE PERIODIC INSPECTION.
 - FLOOR AND ROOF DECK WELDING MAY HAVE PERIODIC INSPECTION.
 - WELDED STUDS USED FOR DIAPHRAGM OR COMPOSITE CONSTRUCTION MAY HAVE PERIODIC INSPECTION.
 - WELDED SHEET STEEL FOR COLD FORMED STEEL FRAMING MAY HAVE PERIODIC INSPECTION.
 - WELDED STAIRS AND RAILING SYSTEMS MAY HAVE PERIODIC INSPECTION.

- NONDESTRUCTIVE TESTING: ALL COMPLETE JOINT PENETRATION WELDS REQUIRE ULTRASONIC TESTING. THE RATE OF TESTING MAY BE REDUCED TO 25% IF THE FAILURE RATE MEETS THE REQUIREMENTS OF CBC.

STRUCTURAL OBSERVATION

PROJECT CONSTRUCTION OBSERVATION IS REQUIRED BY THE PROJECT STRUCTURAL ENGINEER IN ACCORDANCE WITH THE 2016 CBC SECTION 1704.5. THE PROJECT STRUCTURAL ENGINEER OF RECORD SHALL BE RETAINED BY THE OWNER TO PERFORM THESE STRUCTURAL OBSERVATIONS AS DEFINED IN THE 2016 CBC SECTION 1702. REPORTING ANY OBSERVED DEFICIENCIES TO THE OWNER, CONTRACTOR AND BUILDING OFFICIAL, AND SUBMITTING A FINAL SUMMARY REPORT STATING SITE VISITS HAVE BEEN MADE, NOTING ANY DEFICIENCIES, WHAT CORRECTIVE WORK HAS BEEN COMPLETED, AND THAT CONSTRUCTION PROCEEDED IN ACCORDANCE WITH APPROVED PLANS AND APPLICABLE CODES PER 2016 CBC SECTION 1704.5.

- LATERAL SYSTEM ELEMENTS

FOUNDATIONS & BUILDING PADS

- SITE PREPARATION SHALL BE AS SHOWN IN THE UPDATED GEOTECHNICAL RECOMMENDATIONS BY SHW CONSULTING ENGINEERS & GEOLOGISTS, INC. REFERENCE 071100, DATED MAY 19, 2017, AND AS DESCRIBED BELOW FOR MAT SLAB CONSTRUCTION. SPECIAL INSPECTION IS REQUIRED FOR SITE PREPARATION, GRADING, FILLING, COMPACTING AND FOOTING EXCAVATIONS.
- ALLOWABLE SOIL PRESSURE: **1500 PSF (D+L)**
2000 PSF (D+L + W OR E)
- MAT SLAB / FOUNDATION DEPTHS SHOWN ON STRUCTURAL DRAWINGS ARE THE MINIMUM REQUIRED. MAT SLAB / FOUNDATION DEPTHS SHALL BE SUBJECT TO APPROVAL BY THE SOIL ENGINEER DURING FOUNDATION EXCAVATION AND CONSTRUCTION.
- MAT SLAB / FOUNDATION DEPTHS MAY BE CONTROLLED BY MINIMUM EMBEDMENT REQUIREMENTS PER TRENCH LOCATIONS, A PIPE SLEEVE THROUGH THE FOOTING OR MINIMUM CONCRETE COVER OVER HOLLOW ANCHOR BOLTS. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE ALL ITEMS THAT AFFECT FOOTING DEPTHS.
- BUILDING PAD:** EACH BUILDING PAD CONSISTS OF A PREPARED AREA, THE PERIMETER OF WHICH IS A MINIMUM OF 5 FEET OUTSIDE OF THE BUILDING PERIMETER AND A MINIMUM DEPTH OF CONC SLAB TH + 12 INCHES MEASURED FROM THE FINISH SURFACE OF THE CONCRETE MAT SLAB.
- BUILDING PAD PREPARATION:**
- CUT AND/OR FILL EXISTING SITE GRADE TO AT LEAST CONC SLAB TH + 12 INCHES BELOW THE FINISH SURFACE ELEVATION OF THE CONCRETE MAT SLAB. STRIP AND REMOVE ANY ORGANIC SOILS, CONCRETE DEBRIS, OR WOOD DEBRIS. COMPACT SUBGRADE SOILS BEFORE PLACING ANY FILL. COMPACT FILL TO 90% MINIMUM PER ASTM D.
- SCARIFY AND COMPACT, (90% MINIMUM ASTM 1557), THE UPPER 6 INCHES OF EXPOSED SUBGRADE SOILS. IN ADDITION, THE SUBGRADE SURFACE SHOULD BE PROOF-ROLLED USING A LOADED 10 WHEEL, 10 YARD DUMP TRUCK, OR EQUIVALENT, UNDER THE OBSERVATION OF THE GEOTECHNICAL ENGINEER. THE SOIL SHOULD BE DAMP OR MOIST, NOT WET OR DRY, AND A FIRM, NON-YIELDING SURFACE SHOULD BE EVIDENT DURING THE PROOF-ROLLING OPERATION. IF A YIELDING OR RAVELING SURFACE IS OBSERVED, (PUMPING, WEAVING UNDER WHEEL LOADS), ADDITIONALLY EXCAVATE THE YIELDING OR RAVELING AREA AND REPLACE THE OVER EXCAVATED MATERIAL WITH CALTRANS SPECIFICATION CLASS 2 ROCK, IN A MANNER THAT WILL RESULT IN A STABLE SUBGRADE SURFACE UNDER THE PROOF-ROLLING OPERATION.
- PLACE A LAYER OF GEOGRID (TENCATE MIRAFI BXG12 OR EQUAL), ON THE SUBGRADE SURFACE.
- PLACE AND COMPACT STRUCTURAL FILL SECTION ABOVE THE FABRIC.

STRUCTURAL FILL

- STRUCTURAL FILL MATERIAL SHALL CONSIST OF RELATIVELY NON-PLASTIC MATERIAL CONTAINING NO ORGANIC MATERIAL OR DEBRIS, AND NO INDIVIDUAL PARTICLES OVER 6 INCHES ACROSS.
- LIQUID LIMIT *LL* < 40
- PLASTICITY INDEX *x* < 15
- STRUCTURAL FILL CONSISTING OF GRAVEL SHOULD BE WELL GRADED TO INCLUDE A VARIETY OF PARTICLE SIZES.
- STRUCTURAL FILL SHALL BE COMPACTED IN 6 INCH LIFTS TO A MINIMUM OF 90% OF THE MAXIMUM RELATIVE DRY DENSITY AS DETERMINED BY THE CURRENT ASTM D1557 TEST METHOD.

CAPILLARY BREAK ROCK

- A MINIMUM 4 INCH LAYER OF CAPILLARY BREAK ROCK SHALL BE PROVIDED UNDER THE CONCRETE SLABS AT ALL BUILDINGS.
- CAPILLARY BREAK ROCK SPECIFICATION: NO. 4 U.S. SIEVE MINIMUM, UP TO 1 INCH MAXIMUM GRAVEL.

CONC SLAB MOISTURE / VAPOR BARRIER

- BUILDING FOUNDATION CONCRETE MAT SLABS SHALL BE UNDERLAIN BY A MOISTURE BARRIER MANUFACTURED FOR THE PURPOSE OF MINIMIZING THE TRANSMISSION OF SOIL MOISTURE UP THROUGH THE SLAB.
- EXAMPLE PRODUCTS INCLUDE MOSTISTOP 737, TU-TUFF 4 BY STO-COTE PRODUCTS, GRIFFOLYN T-65 BY GRIFFOLYN COMPANY, OR A POLYETHYLENE VAPOR REDUCTION MEMBRANE AT LEAST 10 MILS IN THICKNESS.
- MEMBRANE JOINTS SHALL BE OVERLAPPED 2 FEET MINIMUM, AND TAPED.

CONCRETE

CONCRETE SHALL BE READY-MIXED IN ACCORDANCE WITH ASTM C94. CONCRETE CONSTRUCTION SHALL CONFORM TO THE CURRENT EDITION OF ACI 301 & 318 AND HAVE PROPERTIES AS LISTED BELOW:

CONCRETE ELEMENT	MAX WATER / CEMENT RATIO	MIN 28 DAY COMPRESSIVE STRENGTH (psi)	MAX SIZE AGGREGATE (INCHES)	MAX SLUMP (INCHES)	TOTAL AIR CONTENT (%)
MAT SLAB	0.45	3000	3/4	4	-
FLAT WORK	0.45	3000	3/4	4	5% ± 1%

- CONCRETE MATERIAL PROPORTIONS - THE CONCRETE PRODUCTION FACILITY SHALL HAVE ESTABLISHED CONCRETE MATERIALS PROPORTIONS INCLUDING WATER-CEMENT RATIO FOR EACH CLASS OF CONCRETE SPECIFIED. THE ESTABLISHED PROPORTIONS SHALL BE BASED ON TEST RECORDS AS SPECIFIED IN ACI 318, CURRENT EDITION.
- CEMENT SHALL MEET THE REQUIREMENTS OF ASTM C150, TYPE II.
- AIR ENTRAINING AGENT SHALL CONFORM TO ASTM C260.
- SLUMP SHALL BE MEASURED AT THE TRUCK DISCHARGE. PUMPING OF CONCRETE MAY REQUIRE ADMIXTURES TO INCREASE SLUMP BEYOND THE MAXIMUM SLUMP LISTED ABOVE. ADMIXTURES ARE SUBJECT TO THE ENGINEER'S REVIEW. THE SPECIAL INSPECTOR SHALL BE PROVIDED WITH A BATCH TICKET AND WEIGHT TAG UPON DELIVERY OF EACH LOAD OF CONCRETE.
- ALL CONCRETE SHALL BE PLACED WITH MECHANICAL VIBRATION UNLESS NOTED OTHERWISE.
- ALL EXPOSED CORNERS OF CONCRETE SHALL HAVE 3/4" MIN CHAMFER UNLESS NOTED OTHERWISE.
- CONCRETE COVERAGE TO FACE OF REINFORCING BARS, UNLESS OTHERWISE NOTED, SHALL BE:

- | | |
|------|--|
| 3" | WHERE CONCRETE IS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH |
| 2" | FOR #5 OR SMALLER BARS WHERE CONCRETE IS EXPOSED TO EARTH OR WEATHER AFTER REMOVAL OF FORMS |
| 3/4" | FOR #11 BARS AND SMALLER IN SLABS AND WALLS WHERE CONCRETE IS NOT EXPOSED TO WEATHER OR NOT IN CONTACT WITH GROUND |

REINFORCING STEEL

- REINFORCING STEEL SHALL BE A615 GRD 60 DEFORMED BARS WITH MARKS LEGIBLY ROLLED INTO THE BAR. THE SIZE, TYPE OF END ANGLE AND FIELD STRENGTH, ALL WELDED REINFORCING STEEL BARS SHALL MEET THE REQUIREMENTS OF ASTM A706.
- REINFORCING STEEL LAP SPLICES SHALL BE IN ACCORDANCE WITH ACI 318, CURRENT EDITION, UNLESS NOTED OTHERWISE. SEE TYPICAL REBAR SPLICE SCHEDULE FOR REQUIRED BAR LAP LENGTHS AT SPLICES. STAGGER SPLICES WHEN POSSIBLE.

NON-SHRINK GROUT

NON-SHRINK GROUT SHALL BE FLOWABLE, WITH A MINIMUM 7 DAY COMPRESSIVE STRENGTH OF 5000 PSI. NON-SHRINK GROUT SHALL BE MASTERFLOW 928 OR APPROVED EQUAL

STRUCTURAL STEEL

ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS, LATEST ADDITION. STRUCTURAL STEEL SHALL HAVE THE FOLLOWING ASTM DESIGNATION:

ASTM DESIG	STEEL SHAPE
A36	PLATE, ANGLES, CHANNEL AND MISCELLANEOUS SHAPES
A992	W SECTIONS AND STRUCTURAL TEES
A500 GRD B	SQUARE AND RECTANGULAR HSS SHAPES
A53 GRD B	ROUND HSS SHAPES

- ALL STRUCTURAL STEEL SHALL RECEIVE SHOP PRIME COAT EXCEPT ON SURFACES RECEIVING WELDS, EMBEDDED IN CONCRETE, OR AT HIGH STRENGTH BOLTED CONNECTIONS. STRUCTURAL STEEL SHALL NOT BE PAINTED WITHIN 3" OF THE CENTERLINE OF THE BOLT HOLES. TOUCH UP PRIMER AFTER CONNECTION IS COMPLETE.
- STRUCTURAL STEEL PERMANENTLY EXPOSED TO WEATHER SHALL RECEIVE TWO COATS OF SEMI-GLOSS ALKYD ENAMEL COMPATIBLE WITH PRIMER.

HIGH STRENGTH BOLTS, NUTS AND WASHERS

- ALL HIGH STRENGTH BOLTS, (HSB), SHALL BE HEAVY-HEX STRUCTURAL BOLTS CONFORMING TO THE REQUIREMENTS OF ASTM A325. BOLT DIMENSIONS SHALL MEET THE REQUIREMENTS OF ANSIA/MSE B18.2.6. THE BOLT LENGTH USED SHALL BE SUCH THAT THE END OF THE BOLT EXTENDS BEYOND OR IS AT LEAST FLUSH WITH THE OUTER FACE OF THE NUT WHEN PROPERLY INSTALLED.
- ALL BOLTED STEEL TO STEEL CONNECTIONS SHALL BE MADE WITH 3/4" Ø A325 HIGH STRENGTH BOLTS, UNLESS OTHERWISE NOTED. BOLT HOLES IN STEEL SHALL BE 1/16" OVERSIZE, UNLESS OTHERWISE NOTED.
- TENSION CONTROL BOLT ASSEMBLIES SHALL CONFORM TO ASTM F1852.
- COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATORS SHALL CONFORM TO ASTM F959.
- TWIST-OFF-TYPE TENSION-CONTROL BOLT ASSEMBLIES SHALL MEET THE REQUIREMENTS OF ASTM F1852.
- BOLTS, NUTS, AND WASHERS PERMANENTLY EXPOSED TO WEATHER SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 OR MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695.
- FLAT CIRCULAR WASHERS AND SQUARE OR RECTANGULAR BEVELED WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F436. A WASHER SHALL BE INSTALLED UNDER THE ELEMENT BEING TURNED. WASHERS FOR OVERSIZED OR SLOTTED HOLES SHALL ALSO COMPLY WITH RCSC SPECIFICATIONS.
- NUT AND WASHER FINISH SHALL MATCH FASTENER AND SHALL BE AS SHOWN BELOW:

ASTM DESIG	BOLT TYPE	BOLT FINISH	ASTM A563 NUT GRADE & FINISH	ASTM F436 WASHER TYPE & FINISH
A325	1	PLAIN (UNCOATED)	C, C3, D, DH, & DH3; PLAIN	1; PLAIN
		GALVANIZED	DH; GALVANIZED & LUBRICATED	1; GALVANIZED
F1852	1	PLAIN (UNCOATED)	C, C3, DH & DH3; PLAIN	1; PLAIN
		MECHANICALLY GALVANIZED	DH; MECHANICALLY GALVANIZED & LUBRICATED	1; MECHANICALLY GALVANIZED
A325	3	PLAIN (UNCOATED)	C, C3, DH & DH3; PLAIN	3; PLAIN
		GALVANIZED	DH; GALVANIZED & LUBRICATED	3; PLAIN

WELDING

- ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS PER AWS "STANDARD QUALIFICATION PROCEDURE" TO PERFORM THE TYPE OF WORK REQUIRED. ALL WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS WELDING CODE.
- ARC WELDING ELECTRODES SHALL BE E70 SERIES FOR A36, A53, A500, A572 AND A592 MATERIAL AND E80 SERIES FOR A706 REINFORCING STEEL. ALL ELECTRODES SHALL BE LOW HYDROGEN WITH A MINIMUM CVN VALUE OF 20 FT-LBS AT 0 DEGREES F. EXCEPTIONS:
 - METAL DECK WELDING
 - STAIR AND HANDRAIL WELDING
 - LIGHT GAGE STEEL WELDING
- WELD METAL TOUGHNESS SHALL BE REPORTED ON THE ELECTRODE MANUFACTURER'S CERTIFICATE OF COMPLIANCE.
- TACK WELDS, AIR-ARC GOUGING AND FLAME CUTTING SHALL NOT BE PERFORMED WITHOUT ADEQUATE PREHEAT OR INCORPORATION INTO THE FINAL WELD.
- THE FILLER METAL MANUFACTURER'S PUBLISHED RECOMMENDATIONS SHALL BE THE BASIS FOR DETERMINING THE ALLOWABLE RANGE OF ESSENTIAL VARIABLES FOR THE PRE-QUALIFIED WPS.
- UNLESS NOTED OTHERWISE ON THE PLANS, BACK-UP BARS FOR CJP WELDS SHALL BE REMOVED FOLLOWED BY BACK-GOUGING AND BACK-WELDING.
- THE WELDING INSPECTOR SHALL FURNISH THE ENGINEER WITH A REPORT VERIFYING THAT ALL WELDS HAVE BEEN DONE IN CONFORMITY WITH THE PLANS, SPECIFICATIONS, CURRENT AWS D1.1 AND ANY OTHER APPLICABLE CODES.

SEISMIC FORCE RESISTING SYSTEM WELDS

WELDS DESIGNATED AS DEMAND CRITICAL SHALL BE MADE WITH FILLER METALS MEETING THE REQUIREMENTS SPECIFIED IN AWS D1.8/D1.8M CLAUSE 6.3.

AWS D1.8/D1.8M REQUIRES THAT ALL SEISMIC FORCE RESISTING SYSTEM WELDS ARE TO BE MADE WITH FILLER METALS CLASSIFIED USING AWS A5 STANDARDS THAT ACHIEVE THE FOLLOWING MECHANICAL PROPERTIES:

Filler Metal Classification Properties for Seismic Force Resisting System Welds		
Property	Classification	
	70 ksi (480 MPa)	80 ksi (550 MPa)
Yield Strength, ksi (MPa)	58 (400) min.	68 (470) min.
Tensile Strength, ksi (MPa)	70 (480) min.	80 (550) min.
Elongation, %	22 min.	19 min.
CVN Toughness, ft-lb (J)	20 (27) min. @ 0 °F (-18 °C) ^a	
	^a Filler metals classified as meeting 20 ft-lb (27 J) min. at a temperature lower than 0 °F (-18 °C) also meet this requirement.	

IN ADDITION TO THE ABOVE REQUIREMENTS, AWS D1.8/D1.8M REQUIRES THAT ALL DEMAND CRITICAL WELDS ARE TO BE MADE WITH FILLER METALS RECEIVING HEAT INPUT ENVELOPE TESTING THAT ACHIEVE THE FOLLOWING MECHANICAL PROPERTIES IN THE WELD METAL:

Mechanical Properties for Demand Critical Welds		
Property	Classification	
	70 ksi (480 MPa)	80 ksi (550 MPa)
Yield Strength, ksi (MPa)	58 (400) min.	68 (470) min.
Tensile Strength, ksi (MPa)	70 (480) min.	80 (550) min.
Elongation, %	22 min.	19 min.
CVN Toughness, ft-lb (J)	40 (54) min. @ 70 °F (20 °C) ^{b, c}	
	^b For LAST of +50 °F (+10 °C). For LAST less than +50 °F (+10 °C), see AWS D1.8/D1.8M sub-clause 6.3.6.	
	^c Tests conducted in accordance with AWS D1.8/D1.8M Annex A meeting 40 ft-lb (54 J) min. at a temperature lower than +70 °F (+20 °C) also meet this requirement.	

ABBREVIATION LIST

#	NUMBER	HSS	HOLLOW STRUCTURAL SECTION
@	AT	HT	HEAVY TIMBER
AB	ANCHOR BOLT	INT	INTERIOR
ACI	AMERICAN CONCRETE INSTITUTE	JST	JOIST
ADDL	ADDITIONAL	JT	JOINT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	K	KIPS
		KSI	KIPS PER SQUARE INCH
ALT	ALTERNATE	L	LIVE LOAD
ARCH	ARCHITECT	L L	LAMINATED STRAND LUMBER
ASCE	AMERICAN INSTITUTE OF CIVIL ENGINEERS	LVL	LAMINATED VENEER LUMBER
ASD	ALLOWABLE STRESS DESIGN	LVL	LEVEL
		MAX	MAXIMUM
ASTM	AMERICAN SOCIETY FOR TESTING OF MATERIALS	MB	MACHINE BOLT
		MECH	MECHANICAL
		MF	MOMENT FRAME
BARS	REINFORCING BARS (REBAR)	MFR	MANUFACTURER
BOARD	BOARD	MIN	MINIMUM
BLDG	BUILDING	No.	NUMBER
BLKG	BLOCKING	NS	NEAR SIDE
BM	BEAM	oc	ON CENTER
BN	BOUNDARY NAILING	OMF	ORDINARY MOMENT FRAME
BRG	BEARING	OPENG	OPENING
BTM	BOTTOM	PC	PORTE COCHERE
CJP	COMPLETE JOINT PENETRATION WELD	PJP	P