

# STRUCTURAL DESIGN VALUES

All values reported are unfactored and strength level, unless noted otherwise

Gravity Design Data		Value
Dead Loads:		
Electronic Sign		1,400 lbs.
Pole Weight		500 lbs.
Wind Design Data		Value
Design Wind Speed (3-sec gust), $V_{ULT}$		115 mph
Design Wind Speed (3-sec gust), $V_{ASD}$		85 mph
Risk Category		III
Exposure Category		C
Applicable Internal Pressure Coefficient		$\pm 0.18$
Design Wind Pressure(s)		$q_s = 24.3$ psf
Design Wind Force		$F = 1,700$ lbs.
Earthquake Design Data		Value
Risk Category		III
Importance Factor, $I_e$		1.25
Mapped Spectral Response Accelerations		$S_{MS} = 1.105$ g $S_{M1} = 0.405$ g
Site Class		D
Spectral Response Coefficients		$S_{DS} = 0.779$ g $S_{M1} = 0.431$ g
Seismic Design Category		D
Analysis Procedure Used	Equivalent Lateral Force Procedure (ASCE 7, 12.8)	
Nonbuilding Structure, not Similar to Building System	Signs and Billboards, Chapter 15 ASCE 7-10	
Response Modification Factor		$R = 3$
Seismic Response Coefficient		$C_s = 0.325$
Design Base Shear		$V = 683$ lbs.
Geotechnical Design Data		Value
Geotechnical Report prepared by: 2016 California Building Code, Chapter 18A		
Allowable Soil Bearing Pressure (DL + LL)		1500 psf
Design Passive Pressure, Unconstrained, $P_p$		100 pcf
Design Skin Friction, $f_s$		100 psf

# STRUCTURAL OBSERVATION

- Structural Observation is the visual observation of the structural system by a Registered Design Professional for general conformance to the approved construction documents at significant construction stages and at completion of the structural system. Structural Observation does not include or waive the responsibility for the inspection required by Section 110, 1704A or other Sections of the California Building Code.
- All Structural Observation shall be provided in accordance with CBC Sections 1702A and 1704A.6.
- The owner shall employ the Structural Engineer of Record to perform Structural Observation in accordance with CBC Section 1704A.6. The Structural Engineer of Record may designate another Engineer or Architect to perform Structural Observation.
- The contractor shall notify this office 48-72 hours in advance of requesting a Structural Observation.
- Structural Observation is required at significant construction stages and at completion of the structural system, as follows:
  - Footing excavations completed, footing reinforcing bars in-place, embedded items in place, mechanical, plumbing and electrical items in place and prior to concrete placement.
  - Structural steel erected and lateral systems installed, prior to closing in wall framing.
- The Structural Observer shall submit to the Authority Having Jurisdiction a written statement that the site visits have been made and identifying any structural deficiencies that, to the best of their knowledge, have not been resolved.

# SPECIAL INSPECTION

- ### GENERAL NOTES
- All Special Inspection shall be provided in accordance with CBC Section 1704A and 1705A.
  - Where Special Inspection is required, all inspection or testing shall be provided by an "approved agency" in accordance with CBC Section 1702A.1, 1703A.1 and 1704A.1.
  - Special Inspectors shall keep records of inspections. The Special Inspector shall furnish inspection reports to the Authority Having Jurisdiction, and to the Architect or Engineer of Record. Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the Authority Having Jurisdiction and to the Architect or Engineer of Record prior to the completion of that phase of work. A final report documenting required Special Inspections and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon by the permit applicant and the Authority Having Jurisdiction prior to the start of work.
  - Special Inspectors shall be approved by local Authority Having Jurisdiction in accordance with CBC Section 1704A.2.1.
  - Local Authority Having Jurisdictions may require Special Inspection for "Special Cases" in accordance with CBC Section 1705A.1.1
  - Contractor's responsibility: Each contractor responsible for the construction of a Main Lateral-Force-Resisting System, listed in the Statement of Special Inspection shall submit a written statement of responsibility to the Authority Having Jurisdiction and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:
    - Acknowledgement of awareness of the special requirements contained in the statement of special inspections;
    - Acknowledgement that control will be exercised to obtain conformance with the construction documents approved by the Authority Having Jurisdiction;
    - Procedures for exercised control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and
    - Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.
  - Refer to Special Inspection requirements by other disciplines not included herein.

### CONCRETE CONSTRUCTION<sup>8D</sup>

Verification and Inspection	Continuous	Periodic
1. Inspection of reinforcing steel including prestressing tendons, and placement. <sup>a</sup>		✓
2. Inspection of reinforcing steel welding in accordance with Table 1705A.2.2. Item 5b. <sup>d</sup>		✓
3. Inspection of anchors cast in concrete. <sup>e</sup>		✓
4. Inspection of anchors post installed in hardened concrete members. <sup>b,d</sup>		✓
5. Verifying use of required design mix. <sup>f</sup>	✓	
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete. <sup>h</sup>	✓	
7. Inspection of concrete and shotcrete placement for proper application techniques. <sup>1</sup>	✓	
8. Inspection for maintenance of specified curing temperature and techniques. <sup>1</sup>	✓	
9. Inspection of prestressed concrete: <sup>a</sup> a. Application of prestressing forces b. Grouting of bonded prestressing tendons in the Seismic Force-Resisting System		✓
10. Erection of precast concrete members. <sup>1</sup>		✓
11. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs. <sup>10</sup>		✓
12. Inspect formwork for shape, location and dimensions of the concrete member being formed. <sup>9</sup>		✓

- Notes: Concrete Construction**
- Where applicable, see also CBC Section 1705A.12, Special Inspections for seismic resistance
  - Specific requirements for Special Inspection shall be included in the research report for the anchor issued by an approved source in accordance with ACI 318-14 Section 17.8.2 or other requirements. Where specific requirements are not provided, Special Inspection requirements shall be specified by the Registered Design Professional and shall be approved by the Building Official prior to the commencement of the work.
  - ACI 318: Ch. 20, 25.2, 25.3, 26.5-1-26.5.3, CBC: 1908.4
  - AWS D1.4, ACI 318: 26.5.4
  - ACI 318: 17.8.2
  - ACI 318: 17.8.2.4, 17.8.2
  - ACI 318: Ch. 19, 26.4.3, 26.4.4, CBC: 1904.1, 1904.2
  - ASTM C172, ASTM C31, ACI 318: 26.4.5, 26.12, CBC: 1908.10, 1908.2, 1908.3
  - ACI 318: 26.4.5, CBC: 1908.6, 1908.7, 1908.8
  - ACI 318: 26.4.7-26.4.9, CBC: 1908.9
  - ACI 318: 26.9.2.1, 26.9.2.3
  - ACI 318: Ch. 26.8
  - ACI 318: 26.10.2
  - ACI 318: 26.10.1 (b)
  - CBC Section 1705A.3 and Table 1705A.3
  - See Special Cases Special Inspection for more requirements

### STEEL CONSTRUCTION<sup>8D</sup>

Verification and Inspection	Continuous	Periodic
Required verification and inspection of steel construction		
1. Material verification of structural steel, high-strength bolts, nuts and washers:		
a. For structural steel, identification markings to conform to AISC 360, or ASTM Standards Specified in approved Construction Documents. Manufacturer's certificate of compliance required.		✓
2. Material verification of structural steel:		
a. Identification markings to conform to ASTM standards specified in the approved construction documents.		✓
b. Manufacturer's certified test reports.		✓
3. Inspection of high-strength bolting:		
a. Snug-tight joints		✓
b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist off bolt or direct tension indicator methods of installation		✓
c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation	✓	
4. Material verification of weld filler materials:		
a. Identification markings to conform to AWS specification in the approved Construction Documents		✓
b. Manufacturer's certificate of compliance required		✓
5. Inspection of welding:		
a. Structural steel:		
1) Complete and partial joint penetration groove welds	✓	
2) Multi-pass fillet welds	✓	
3) Single-pass fillet welds $> \frac{3}{16}$ "	✓	
4) Plug and slot welds	✓	
5) Single-pass fillet welds $< \frac{3}{16}$ "		✓
Inspection tasks prior to welding		
1. Welding procedure specifications (WSPs) available	✓	
2. Manufacturer certifications for welding consumables available	✓	
3. Material identification (type/grade)		✓
4. Welder identification system <sup>8</sup>		✓
5. Fit-up of groove welds (including joint geometry) Joint preparation, dimensions, cleanliness, tacking, backing type and fit		✓
6. Configuration and finish of access holes		✓
7. Fit-up of fillet welds Dimensions, cleanliness, tacking		✓
8. Check welding equipment		✓
Inspection tasks during welding		
1. Use of qualified welders		✓
2. Control and handling of welding consumables Packaging, exposure control		✓
3. No welding over cracked tack welds		✓
4. Environmental conditions Wind speed within limits, precipitation and temperature		✓
5. WPS followed Settings on welding equipment, travel speed, selected welding materials, shielding gas type/flow rate, preheat applied, interpass temperature maintained min./max., proper position (F, V, H, OH)		✓
6. Welding techniques Interpass and final cleaning, each pass within profile limitations		✓
Inspection tasks after welding		
1. Welds cleaned		✓
2. Size, length and location of welds	✓	
3. Welds meet visual acceptance criteria Crack prohibition, weld/base-metal fusion, crater cross section, weld profiles, weld size, undercut, porosity	✓	
4. Arc strikes	✓	
5. k-Area <sup>7</sup>	✓	
6. Backing removed and weld tabs removed (if required)	✓	
7. Repair activities	✓	
8. Document acceptance or rejection of welded joint or member		✓

### STEEL CONSTRUCTION, CONTINUED

Verification and Inspection	Continuous	Periodic
Inspection tasks prior to bolting <sup>8</sup>		
1. Manufacturer's certifications available for fastener materials	✓	
2. Fasteners marked in accordance with ASTM requirements		✓
3. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)		✓
4. Proper bolting procedure selected for joint detail		✓
5. Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements		✓
6. Pre-installation certification testing by installation personnel observed and documented for fastener assemblies and methods used		✓
7. Proper storage provided for bolts, nuts, washer and other fastener components		✓
Inspection tasks during bolting		
1. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required		✓
2. Joint brought to the snug-tight condition prior to the pretensioning operation		✓
3. Fastener component not turned by the wrench prevented from rotating		✓
4. Fasteners are pretensioned in accordance with the RSC specification, progressing systematically from the most rigid point toward the free edges, see Minimum Bolt Pretension table below		✓
Inspection tasks after bolting		
1. Document acceptance or rejection of bolted connections	✓	
Notes: Steel Construction		
a. CBC Section 1705A.2 and Table 1705A.2.2		
b. CBC Section 1707A.11.1		
c. AWS D1.3		
d. AWS D1.4, ACI 318: Section 3.5.2		
e. The fabricator or erector, as applicable, shall maintain a system by which a welder who has welded a joint or member can be identified. Stamps, if used, shall be the low-stress type.		
f. When welding of doubler plates, continuity plates or stiffeners has been performed in the k-area, visually inspect the web k-area for cracks within 3 inches of the weld		
g. All methods of installation for high strength bolts shall require verification of pre-tension by a Skidmore-Welhelm calibrator for each batch or source of bolts used (see minimum pre-tension chart below).		
Minimum Bolt Pretension (kips)		
Bolt size, inches	Group A (A325, etc.)	Group B (A490, etc.)
$\frac{1}{2}$ " Diameter	12	15
$\frac{3}{8}$ " Diameter	19	24
$\frac{1}{2}$ " Diameter	28	35
$\frac{3}{4}$ " Diameter	39	49
1" Diameter	51	64
$1\frac{1}{8}$ " Diameter	56	80
$1\frac{1}{4}$ " Diameter	71	102
$1\frac{3}{8}$ " Diameter	85	121
$1\frac{1}{2}$ " Diameter	103	148

### CAST-IN-PLACE DEEP FOUNDATIONS<sup>8</sup>

Verification and Inspection	Continuous	Periodic
1. Inspect drilling operations and maintain complete and accurate records for each element.	✓	
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end bearing strata capacity. Record concrete or grout volumes.	✓	
3. For concrete elements, perform additional inspections and see Concrete Construction chart, this sheet, in accordance with CBC Section 1705A.3.		


Notes: Cast-in-place Deep Foundations  
a. CBC Section 1705A.8 and Table 1705A.8

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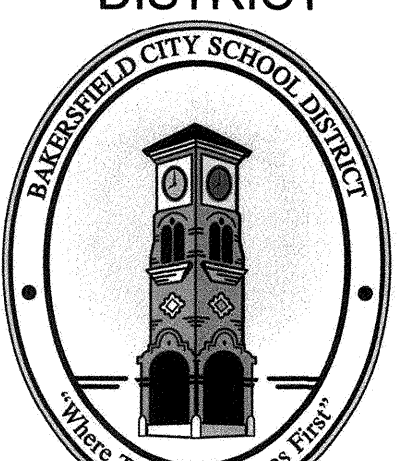
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