

STRUCTURAL NOTES

GENERAL NOTES

- The following notes, typical details and schedules shall apply to all phases of this project unless otherwise shown or noted.
- Specific notes and details shall take precedence over general notes and typical details.
- All materials and workmanship shall conform to the minimum standards of the 2016 edition of the California Building Code (CBC) and such other regulating agencies exercising authority over any portion of the work. The contractor shall have a current copy of the CBC on the job site.
- The "Contract or Construction Documents" shall consist of these notes, details, schedules, plans, and drawings, as well as attached specifications.
- All specifications, including but not limited to materials and products, shall be those put forth in the "Contract or Construction Documents". No substitutions shall be permitted to be used or assumed to be used in the bidding or construction process without written approval by the Engineer of Record.
- The contractor shall examine the "Contract or Construction Documents" and shall notify the Architect or Engineer of Record of any discrepancies he may find before proceeding with the work.
- All information on existing conditions shown on drawings are based on best present knowledge available, but without guarantee of accuracy. The Contractor shall verify and be responsible for all dimensions and conditions at the site and shall notify the Architect or Engineer of Record of any discrepancies between actual site conditions and information shown on or in the "Contract or Construction Documents" before proceeding with work.
- The Contractor shall immediately notify the Architect or Engineer of Record of any condition which in his opinion might endanger the stability of the structure or cause distress of the structure.
- All work shall conform to the best practice prevailing in the various trades comprising work. The Contractor shall be responsible for coordinating the work of all trades.
- These "Contract or Construction Documents" represent the finished structure, and do not indicate the method of construction. The Contractor shall supervise and direct the work and shall be solely responsible for construction means, methods, techniques, sequences and procedures.
- Inspection and approval for fabricator's shops used for fabrication of structural load bearing members, components, materials or assemblies shall conform to CBC Section 1704A.2.5.
 - Labeling (as required or specified) shall be provided in accordance with CBC Section 1703A.5.
 - Evaluation and follow-up inspection services (as required or specified), shall conform to CBC Section 1703A.6.
- The Contractor shall refer to the specifications for information not covered by these drawings and General Notes.
- The Contractor shall provide temporary bracing and shoring for all structural members as required for structural stability of the structure during all phases of construction.
- The Contractor shall take all steps necessary to ensure proper alignment of the structure after the installation of all structural and finish materials. This shall include any necessary preloading of the structure to determine final position of the completed work.
- Observation visits to the project site by field representatives of Architect and/or Engineer of Record (support services) shall not include inspections of safety or protective measures, nor construction procedures, techniques or methods. Any support services performed by Architect or Engineer of Record during any phase of construction, shall be distinguished from continuous and detailed inspection services (as required by any regulating governmental agency, e.g. the Authority Having Jurisdiction) provided by others. These support services, whether of material or work, are performed solely for the purpose of assisting in quality control and in achieving conformance with contract documents, but do not guarantee Contractor's performance and shall not be construed as supervision or construction.
- Provide openings and supports as required per typical details and notes for mechanical, plumbing, and electrical equipment, vents, ducts, piping, etc. All mechanical, plumbing and electrical equipment shall be properly "sway braced" against lateral forces.
- These notes, details, drawings and specifications (Contract or Construction Documents) do not carry necessary provisions for construction safety. These documents and all phases of construction hereby contemplated are to be governed, at all times, by applicable provisions of the current California Occupational Safety and Health Act.
- Where any conflict occurs between the requirements of federal, state and local laws, codes, ordinances, rules and regulations, the most stringent shall govern.
- Refer to the Architectural Drawings to coordinate with Structural Drawings. Any discrepancy between these drawings shall be referred to the Architect or Engineer of Record for clarification before start of construction.
- Written dimensions shall have precedence over scaled dimensions.
- Drawings (notes, schedules, details and plans) shall have precedence over Structural Calculations.
- In the event that certain features of the construction are not fully shown on the drawings or called for in the General Notes or Specifications, then their construction shall be of the same character as for similar conditions that are shown or called for.
- The Contractor shall have a copy of the Project Soils Investigation on the job site.
- ASTM designation and all standards refer to the latest amendments.
- These structural "Contract or Construction Documents" shall not be modified without prior written approval of the Engineer of Record.
- Only structural working drawings approved by the Authority Having Jurisdiction are permitted to be used for construction on this project. All other drawings or documents are obsolete and are not permitted on the job site, nor shall they be used for any construction purposes. Contractors using unapproved drawings or documents are solely responsible for all work not performed in accordance with the "approved" drawings.
- Refer to Architectural Drawings for all fire protection requirements.

FOUNDATION NOTES

- Basic: See Structural Design Values Chart
- Unexpected soil conditions: Allowable values and foundation design are based upon soil conditions shown by test borings. Actual soil conditions which deviate appreciably from that shown in the test borings shall be reported to the Project Soils Engineer immediately.
- See Project Soils Investigation for compaction, fill, backfilling, and site preparation requirements and procedures.
- Excavate to required depths and dimensions (as indicated in drawings and Project Soils Investigation), cut square and smooth with firm level bottoms. Care shall be taken not to over-excavate foundation at lower elevation and prevent disturbing of soils around higher elevation.
- Footings shall be poured in neat excavations, without side forms whenever possible.
- Carry all foundations to required depths into compacted fill or natural soil (as per Structural Plans and Details, and Project Soils Investigation).
- Foundations shall not be poured until all required reinforcing steel, sleeves, inserts, conduits, pipes, etc. and formwork is properly placed and inspected by the Authority having Jurisdiction.
- All foundation excavations shall be inspected and approved by Project Soils Engineer, prior to forming and placement of reinforcing or concrete.
- The sides and bottoms of excavations which are to have concrete contact must be moistened several times just prior to pouring upon them.
- De-water footings, as required, to maintain dry working conditions.

CONCRETE

- All concrete shall have a minimum ultimate compressive strength (F_c) as outlined below at 28 days. All concrete shall be regular weight (unless specifically noted otherwise).
 - Concrete for footings and slab on grade: 3,000 psi w/c = 0.50 max.
 - Concrete for site retaining walls: 3,000 psi w/c = 0.50 max.
 - Concrete for building walls and columns: 3,000 psi w/c = 0.45 max.
 - Concrete for elevated slabs and beams: 3,000 psi w/c = 0.45 max.
- Maximum Fly Ash content shall be 15%, by weight, of total cementitious materials and shall conform to ASTM C618.
- All concrete work shall comply with CBC Chapter 19A and ACI 318-14 and latest edition of ACI Manual of Concrete Practice.
- Special inspection (as required or specified) shall conform to CBC Chapter 17A.
- Cement shall be portland cement Type II/V and shall conform to ASTM C150.
- Aggregates shall conform to ASTM C33, provide aggregates from a single source.
- Water shall conform to ASTM C94 and be potable.
- All splices are to be Class B unless specifically noted otherwise.
- Where not specifically detailed, the minimum concrete cover on reinforcing steel shall be:
 - Concrete cast against and permanently exposed to earth or weather: 3"
 - Concrete placed against forms, but exposed to earth or weather: 2"
 - Slabs, wall & pilots, not exposed to earth or weather: 3/4"
 - Beams, girders & columns, not exposed to earth or weather: 1 1/2"
- Reinforcing bars larger than #8 are not permitted unless specifically detailed or noted otherwise.
- Location of all construction joints, other than specified, shall be approved by Architect/Engineer of Record prior to pouring. Construction joints shall be thoroughly air and water cleaned and heavily roughened so as to expose coarse aggregates. All surfaces to receive concrete shall be maintained continuously wet at least three hours in advance of pouring.
- All reinforcing steel, anchor bolts, dowels, inserts and any other hardware to be set in concrete shall be well secured in position prior to pouring of concrete.
- The Contractor shall obtain approval from Architect/Engineer of Record prior to placing sleeves, pipes, ducts, chases, coning and openings on or through structural concrete beams, walls, floors and roof slabs, unless specifically detailed or noted. All pipes or conduits passing through concrete members shall be sleeved with standard steel pipes. See typical detail for pipe through footing.
- Vibrate all concrete (including slabs on grade) as it is placed, with a mechanical vibrator operated by experienced persons. The vibrator shall be used to consolidate the concrete, not transport it. Reinforcing and forms shall not be vibrated.
- Formwork design and removal shall conform to ACI 318-14 Section 26.11. Remove forms in accordance with the following minimum schedule:
 - Side forms of footings: Minimum 48 hours
 - Edge forms of slab on grade: Minimum 24 hours
 - Wall/retaining wall forms: 72 hours & 70% of design strength
 - Column forms: 72 hours & 70% of design strength
 - Elevated beams and slabs: 14 days & 80% of design strength
- Concrete shall not free fall more than six feet. Use tremie, pump or other approved methods.
- Concrete shall be maintained in a moist condition for a minimum of 5 days after placement.
- The Contractor may use concrete admixtures as a construction means and methods to execute "Contract or Construction Documents". Use of admixture is solely the responsibility of the Contractor.
- Mix designs shall be prepared by an approved testing laboratory, signed by a licensed engineer and shall be submitted to the Engineer of Record for approval.
- Only one grade of concrete shall be allowed on project site at any one time
- Unless specifically detailed or noted otherwise, construction and control joints shall be provided in all concrete slabs, and shall be located such that the area within joints does not exceed 375 sq. ft., and is roughly square.
 - For all structural slabs (suspended or on grade) where Architectural "exposed" conditions are desired, the Contractor shall provide control joint layout for review by Architect or Engineer of Record.
- Every opening (exceeding 24" in either direction) shall have a minimum of 2-#5 (U.N.O.) directly adjacent to all sides as well as top and bottom (unless at foundation). Reinforcing bars shall extend a minimum of 24" past edge of opening.
- Dowel all concrete walls and columns to supporting concrete with bars of the same size and spacing as vertical bars in wall and columns. Do not "hickey" bars. All dowels shall be vertical.
- At the end, as well as top, of walls shall be a minimum of 2-#5 continuous (U.N.O.).
- Concrete strength shall be verified by standard cylinder tests (in accordance with CBC Section 1705A.3) made by an approved testing laboratory.
- Concrete placed when the air temperature has fallen to, or is expected to fall below 40° shall conform to ACI 318-14 Section 26.54, and ACI 306R-16.
- Concrete placed during hot weather shall conform to ACI 318-14 Section 26.5.5, and ACI 305R-14.
- Conduits and sleeves placed within structural concrete shall not be tied directly to structural reinforcement.
 - 1" concrete cover shall be maintained around all reinforcement.

REINFORCING STEEL

- All reinforcing steel shall be deformed intermediate grade bars conforming to ASTM A615, Grade 60 (F_y = 60 ksi) unless noted otherwise.
 - Grade 40 (F_y = 40 ksi) may be used for #3 bars and smaller.
- Reinforcing steel shall not be welded, unless specifically noted otherwise.
- Welding of reinforcing steel (where specifically noted or detailed) shall conform to ACI 318-14, Section 26.6.4 and AWS D1.4. Welded rebar shall be low-alloy steel conforming to ASTM A705.
- To hold reinforcing bars in their true position and prevent displacement, standard tie and anchorage devices must be provided. Placing of reinforcement shall conform to ACI 318-14 Section 26.6.2.
- Shop drawings for fabrication of any reinforcing steel shall be approved by Contractor and submitted to Architect or Engineer of Record, for their review, prior to fabrication.
- Refer to typical details for minimum splice length and minimum radius of bend of reinforcing steel.
- All reinforcing steel splices shall be staggered 24", unless specifically noted or detailed otherwise.
- All reinforcing bar bends shall be made cold.
- Fabrication, erection and placement of reinforcing steel shall conform to Concrete Reinforcing Steel Institute of Standard Practice.
- The sides and bottoms of excavations which are to have concrete contact must be moistened several times just prior to pouring upon them.
- De-water footings, as required, to maintain dry working conditions.
- Epoxy-coated reinforcement (where specifically noted or detailed) shall conform to ASTM A775.

STRUCTURAL STEEL AND WELDING

- All structural steel construction shall conform to AISC 360-10 and AISC 341-10.
 - Fabrication of all structural steel shall be done in the shop of an approved fabricator. Inspection and approval for fabricator's shops used for fabrication of structural load bearing members, components, materials or assemblies shall conform to CBC Section 1704A.2.5.
- All structural steel shall conform to the following specifications:
 - Angles, channels, plates, bars, rounds, and other miscellaneous shapes: Shall conform to ASTM A36 and shall have a minimum yield stress (F_y) of 36 ksi.
 - Wide-flange shapes: Shall conform to ASTM A992 and shall have a minimum yield stress (F_y) of 50 ksi.
 - Steel pipe columns: Shall be welded seamless pipe conforming to ASTM A53, Grade B, and shall have a minimum yield stress (F_y) of 35 ksi.
 - Structural tubes: Shall be ASTM A500, Grade B, and shall have a min. yield stress (F_y) of 46 ksi.
 - Round structural tubes: Shall be ASTM A500, Grade B, and shall have a min. yield stress (F_y) of 42 ksi.
- Special inspection shall be provided for all structural steel and welding, in accordance with CBC Chapter 17A.
- All structural steel shall be fabricated, erected and welded in accordance with AISC Specifications for Structural Steel Buildings (AISC 360-10) and Code of Standard Practice for Steel Buildings and Bridges (AISC 303-10).
- All welding shall be done by qualified and certified welders.
- No field welding permitted, unless specifically noted otherwise.
- Shop drawings for the fabrication of any structural steel shall be approved by the Contractor and submitted to Architect or Engineer of Record for their review, prior to fabrication.
- No holes other than those specifically detailed shall be allowed through structural steel members. Burning of holes is not permitted.
- All structural steel shall be painted one shop coat and field touched-up, as necessary, with approved "Zinc Rich" or other high quality exterior primer.
- All bolts shall conform to ASTM, A307 (U.N.O.)
- All welding shall conform to 'AWS D1.1 and D1.8' specifications for welding. (E-70XX Electrodes).
- All headed studs (for concrete anchorage) shall be manufactured by 'Nelson' or approved equal.
- Where fillet weld size is not indicated, use 'AWS' minimum size based on the thickness of the thinner part being welded, as specified in AISC Specifications for Structural Steel Buildings (AISC 360-10), Section J2.2.
- All butt welds to be complete joint penetration, unless specifically noted otherwise.
- Welder qualification requirements, welding procedure and welding electrodes for all structural steel (except structural sheet steel, see steel decking) shall conform to CBC Sections 1705A.2.1 and 2204A.1.
- Provide hot dip galvanizing or 3" minimum concrete cover around all structural steel below grade.
- Structural steel embedded into concrete or masonry shall be unpainted.
- ASTM A1852 bolts are an acceptable substitution for A325 bolts.

DRILLED CAISSON/PIER AND GRADE BEAM NOTES

- Excavations for drilled caissons/pier shall be performed in compliance with local grading codes and ordinances as well as CBC Chapters 18A and 33A, and as recommended by Project Soils Investigation.
- Provide Special Inspection in accordance with CBC Section 1705A.8 and Table 1705A.8.
- Excavations for all drilled caissons/piers shall be approved by the Project Soils Engineer prior to placing of concrete.
- Reinforcement for drilled caissons/pier shall be approved by the Engineer of Record prior to placing in caisson/pier excavation.
- De-water caisson/pier footings and building excavation as required to maintain dry working conditions.
- Caisson/piers are to be poured by end of day after completion of drilling operation. all concrete for a particular caisson/pier shall be on the job site prior to drilling the pile hole.
- The Contractor shall be responsible for all shoring, bracing, etc. necessary to support cut and/or fill banks, and existing structures during excavation, and the forming and placement of concrete.
- Bottom of caissons/piers shall be thoroughly cleaned prior to placement of concrete.
- Grade beam reinforcement:
 - Stagger splices in horizontal reinforcement.
 - Locate splices between the 1/4 and 3/4 spans (between caisson/piers) of grade beams, unless noted otherwise.

ABBREVIATIONS

A.B.	Anchor Bolt	I D	I nside Diameter
ABV.	Above	I N.	I nches
ACI	American Concrete Institute	I NT.	I nterior
ADD'L	Additional		
ADJ.	Adjacent	JST.	J oist
AHJ	Authority Having Jurisdiction		
AISC	American Institute of Steel Construction	ksi	K ips per Square Inch
AITC	American Institute of Timber Construction	LL	L ive Load
AOR	Architect of Record	LW	L ightweight
APA	American Plywood Association	LSL	L aminated Strand Lumber
APPROX.	Approximate(y)	LVL	L aminated Veneer Lumber
ASCE	American Society of Civil Engineers	MAX.	M aximum
ARCH.	Architect, Architecture	MB	M achine Bolt
ASTM	American Society of Testing and Materials	MBM	M etal Building Manufacturer
ATR	All Thread Rod	MECH.	M echanical
AWS	American Welding Society	MSE	M echanically Stabilized Earth
		MFR.	M anufactured, Manufacturer
		MIN.	M inimum
		MPH	M iles per Hour
		MTL	M etal
BLDG.	Building	(N)	N ew
BLK.	Block	NDS	N ational Design Specification
BLKD.	Blocked	N.T.S.	N ot to Scale
BLK'G	Blocking		
BM.	Beam		
B.O.	Bottom of _____		
BOT.	Bottom		
BRG.	Bearing		
b/y	Between		
CAC	California Administrative Code	OSHPD	Office of State Health Planning and Development
CANT.	Cantilever	OSWJ	Open Web Steel Joist
CBC	California Building Code		
CIP	Cast-in-place	PEN.	P enetration
CJ	Control Joint	PL	P late
CJP	Complete Joint Penetration	PLYWD.	P lywood
C	Centerline	PJP	P artial Joint Penetration
CLG.	Ceiling	psi	P ounds per Square Inch
CLR.	Clear	PSF	P ounds per Square Foot
CMU	Concrete Masonry Unit	PSL	P arallel Strand Lumber
COL.	Column		
CONC.	Concrete		
CONN.	Connection	PEMB	P re-Engineered Metal Building
CONST.	Construction	PERF.	P erforated
CONT.	Continue, Continuous	PTDF	P ressure Treated Douglas Fir
CSK.	Countersink	PW	P uddle Weld
∅	Diameter	Q.A.	Quality Assurance
d	Penny	Q.C.	Quality Control
DBL.	Double		
DCW	Demand Critical Weld	RBS	R educed Beam Section
DET.	Detail	RDDW	R edwood
DEMO	Demolition	REBAR	R einforcing Bar
DF	Douglas Fir	REINF.	R einforcement
DIAG.	Diagonal	RET.	R etaining
DL	Dead Load	REQ'D	R equired
DSA	Division of State Architect		
DWGS.	Drawings	S.F.	S quare Feet
		SHT.	S heet
EA.	Each	SHT'G	S heathing
E.A.	Each Face	SIM.	S imilar
ELEC.	Electric, Electrical	SIP	S tructural Insulated Panel
ELEV.	Elevation	SJI	S teel Joist Institute
EMBED.	Embedded, Embedment	SLS	S eismic Load Resisting System
E.N.	Edge Nailing	SMS	S heet Metal Screw
EOR	Engineer of Record	SQ.	S quare
EQ.	Equal	SS	S elect Structural
EQUIP.	Equipment	STAGG'D	S taggered
E.S.	Each Side	STD.	S tandard
E.W.	Each Way	STL.	S teel
(E)	Existing	SW	S hearwall
EXP.	Expansion	SEOR	S tructural Engineer of Record
EXT.	Exterior	T&B	T op and bottom
		T&G	T ongue and Groove
FAB.	Fabricated	THR'D	T hreaded
FDN.	Foundation	T.O.	T op of _____
F.F.	Finish floor	TRL.	T riple
FLR.	Floor	TYP.	T ypical
F.O.	Face of _____		
FRMG.	Framing	UNBLKD.	U nblocked
FT.	Foot, Feet	U.N.O.	U nless Noted Otherwise
FTG.	Footing	URM	U nreinforced Masonry
		VERT.	V ertical
GA.	Gauge	VIF	V erify in Field
GALV.	Galvanized		
GEOR.	Geotechnical Engineer of Record		
GLB	Glued-Laminated Beam	w/	W ith
GYP. BD.	Gypsum Board	w/c	W ater/Cement Ratio
		WD.	W ood
HDR.	Header	W.D.	W orking Point
HD.	Holddown	W.S.M.F.	W elded Steel Moment Frame
HORIZ.	Horizontal	WSS	W elded Steel Stud
HSS	Hollow Steel Section	WT.	W eight
HT.	Height	WWM	W elded Wire Mesh
I BC	I nternational Building Code		
I CC	I nternational Code Council		
I CF	I nsulated Concrete Form		

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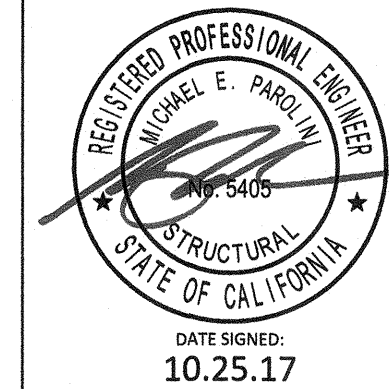
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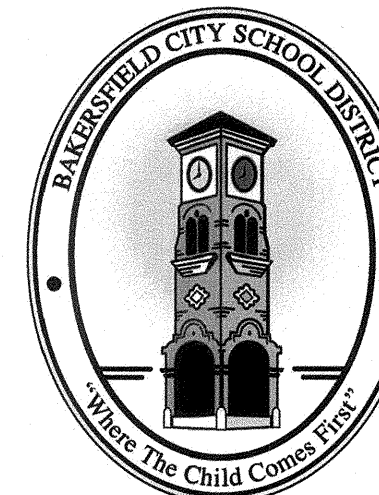
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SHEET TITLE

STRUCTURAL NOTES

SHEET NUMBER

S1100

CONSTRUCTION DOCUMENTS