

GENERAL NOTES

GENERAL

1. All work shall comply with 2013 California Building Code, California Code of Regulations, Title 24, Part 2, Volume 2 of 2 (including all supplements) and all other local or state agencies having jurisdiction over this project.
2. All drawings and specifications are considered to be a part of the Contract Documents. The Contractor shall be responsible for the review and coordination of all drawings and specifications prior to the start of construction. Any discrepancies that occur shall be brought to the attention of the Architect prior to the start of construction so that a clarification can be issued. Any work performed in conflict with the Contract Documents or any code requirements shall be corrected by the Contractor at his own expense and at no expense to the Owner or Architect.
3. All symbols and abbreviations used on the drawings are considered to be construction standards. If clarification is required, the Contractor shall notify the Architect prior to proceeding with the work.
4. All dimensions and the site conditions shall be verified by the Contractor at the job site prior to bid submittal, start of shop drawings, start of construction, and/or fabrication of materials. If discrepancies are encountered, or conditions develop not covered by the Contract Documents, the Architect shall be notified for clarification. Contractor shall provide and be responsible for the protection and repair of adjacent existing surfaces and areas which may be damaged as a result of new work.
6. Do not scale drawings. Printed dimensions have precedence over scaled drawings and large scale over small.
7. Typical details shall apply in general construction unless specifically detailed. Where no details are given, construction shall be as shown for similar work.
8. The Contract Documents and Specifications represent the finished structure. They do not indicate the method of construction. The Contractor shall provide all measures necessary to protect the structure and safety of workmen during construction. Such measures shall include but not be limited to, bracing, shoring for loads due to construction equipment, etc. Observation visits to the site by the Architect or Structural Engineer shall not include inspection of the above items and does not in any way relieve the Contractor of his responsibilities for the above.
9. For trenches or excavations (5) five feet or more in depth into which a person is required to descend, the Contractor is to obtain the necessary permit from the State of California, Division of Industrial Safety, prior to the issuance of a building permit. Refer to the architectural, electrical and mechanical drawings for details, conditions, pits, trenches, depressions, roof openings, sleeves, items to be embedded or attached to structural elements, etc., not shown on the structural drawings.
11. No holes, notches, blockouts, etc. are allowed in structural elements unless detailed on the structural drawings or approved by the Structural Engineer.
12. All information shown on the drawings relative to existing conditions is given as the best present knowledge from plans supplied by the Owner, but without guarantee of accuracy. Where actual conditions conflict with the drawings, they shall be reported to the Architect or Engineer so that proper clarification may be made. Modification of details of construction shall not be made without written approval of the Architect or Structural Engineer.

DEMOLITION

1. All demolition shall be carried on in such a way as not to damage existing elements which are to remain.
2. All elements which are to remain and which are damaged during demolition work shall be replaced at no added cost. Existing elements to be protected to the fullest extent possible to reduce such damage to a minimum.

EARTHWORK

1. Minimum allowable soil bearing pressure is considered 1500 psf with an allowable passive pressure of 100 pcf.
2. Site preparation shall be done as follows:
The exposed native soils shall be scarified, brought to a moisture content of not less than optimum but not greater than 3 percent above optimum and be compacted to a minimum 93 percent of maximum dry density as determined by ASTM Test Method D1557. Moisture conditions similar to the moisture-conditioning of the native scarified soils must be maintained during compaction.
3. Any imported fill soil that may be required shall be silty sand with an expansion index of 15 or less.
4. All required backfill shall be mechanically compacted in 8" maximum thick layers. Flooding is not permitted. Backfill shall be compacted to 95% of the maximum dry density obtainable by the ASTM D1557 method of compaction.
5. Extreme care shall be exercised when excavating or grading adjacent to existing structures or improvements so as not to damage or undermine foundations, walls, slabs, utilities, etc.

CONCRETE

1. All cement shall conform to ASTM C-150, Type I or II.
2. Fine and coarse aggregate shall conform to ASTM C-33.
3. Concrete shall have the following minimum 28 day strength:
All concrete U.N.O. = 3000 psi Stone.
4. Concrete design mixes shall be prepared by the approved testing lab, using CBC 1905A.3 and approved by the Structural Engineer.
5. Placing of all concrete shall be inspected by the job inspector. Inspector to verify that reinforcing steel is securely supported in place during the pour.
6. Location of construction joints or pour joints shall be as shown on plans or as approved by the Engineer or Architect prior to pouring concrete and conform to Title 24 1906A.4.
7. Anchor bolts, dowels, reinforcing steel, inserts, etc., shall be securely tied in place prior to pouring concrete. Concrete blocks only shall be used to support reinforcing off grade.
8. Concrete slabs shall be cured by keeping continuously wet for 7 days. No curing compounds shall be used unless approved by the Structural Engineer.
9. Notify the Structural Engineer 48 hours minimum prior to all pours.
10. Provide 3/4" chamfer on all exposed concrete corners.
11. All concrete shall be vibrated in place during placing of concrete.
12. No stakes, steel or wood, shall be permitted in any concrete pour. Suspend forms from above grade.
13. Drypack shall have a minimum 28 day strength of 4000 psi.
14. Grout shall have a minimum 28 day strength of 4000 psi.

REINFORCING

1. All reinforcing steel shall conform to ASTM A-706 specifications, Grade 60 (except #3 bars may be grade 40).
2. Reinforcing bars shall be spliced and bent in strict accordance with the drawings and details and C.R.S.I. publications. No kinks allowed. All bars shall be clean prior to concrete placement.
3. Provide dowels of same size and number from adjacent pour, both vertically and horizontally to match typical reinforcing shown (Unless Noted Otherwise). Laps to be in accordance with the drawings and details. Dowels shall be cleaned after pour.
4. Field welding or bending of reinforcing is not permitted except as indicated on the drawings or as approved by the Structural Engineer and VA.

STRUCTURAL STEEL

1. Structural steel shall conform to ASTM Specifications as noted below and to the AISC Specifications for fabrication and erection:
- All structural steel U.N.O.: A-572, Grade 50 or A-992, Grade 50.
- Angles, channels, tees and their connection plates and miscellaneous (not listed in other notes) may be A-36.
- Pipe Sections: A-53, Grade B.
- Tube Sections: A-500, Grade B.
2. All welding shall conform to the specifications of the American Welding Society and shall be performed by certified welders using E70XX electrodes (U.N.O.) and the electric arc process. Submit written Welding Procedure Specifications for review prior to fabrication.
3. Weld lengths called for on the plans are the net effective length required. Where fillet weld symbol is given without indication of size, use minimum size welds as specified in AISC Manual of Steel Construction, latest Edition, Table J.2.4.
4. All steel exposed to weather shall be hot-dipped galvanized after fabrication. Abraded areas to be touched up with galvaloy. All tubes and/or pipes shall have welded cap plates to seal exposed ends.
5. Bolts shall conform to ASTM A-307 specifications typically unless noted otherwise as H.S.B. High strength bolts to conform to ASTM A-325SC (std.). Anchor bolt rod material shall conform to A193 GR.97 U.N.O.
6. All structural steel shall be fabricated in the shop of a fabricator licensed by the local building department and shop drawings shall be submitted to the Architect for approval prior to fabrication.
7. All field welding, including minor or tack welding, shall be continuously inspected by an approved welding inspector, and conform to all welding requirements as per AWS D1.1.
8. Provide one shop coat of paint on all structural steel not covered with concrete, fireproofing, masonry or at contact surfaces at high strength bolts. Not required where note 4 is applied.

DESIGN CRITERIA

1. Seismic Parameters
 $I_s = 1.5$
 $S_{WS} = 1.00g$
 σ_x & R_x per tables 13.5-1 & 13.6-1 of ASCE 7-10
2. Wind Parameters
Basic Wind Speed = 85 mph
Exposure = C
 $I = 1.15$ $K_{zt} = 1.0$

CONTINUOUS SLOT METAL FRAMING SYSTEM

1. Metal framing system shall be Unistrut as specified on plans and details. The metal framing system shall consist of channels, fittings and hardware as defined in the Metal Framing Manufacturers Association Standard Publication MFMA-1. All fittings and accessories shall be from the same manufacturer, with no exceptions.
2. All channels shall be cold formed from 12 ga. steel conforming to ASTM A570, Grade 33, have a nominal overall width of 1 5/8" and have a 7/8" slot face opening.
3. All fittings shall be made from hot rolled, pickled and oiled plate or strip steel conforming to ASTM A635.
4. All bolts shall be A307 with channel nuts conforming to ASTM A675 or ASTM A36. Torque all bolts per table below:
Bolt Torque Table:
Bolt Size (Dia.) 1/4" 5/16" 3/8" 1/2" 5/8" 3/4"
Torque (Ft. Lbs.) 6 11 19 50 100 125
5. Channel material and fittings shall have standard finish of Perma Green or Dura Green epoxy paint. Fasteners shall have standard electro-plated zinc finish. Framing, fittings and fasteners exposed to weather shall be hot-dipped galvanized after fabrication.
6. Channels shall have the following minimum section properties:
UNISTRUT SYSTEM:

Area (sq.in.)	Axis 1-1			Axis 2-2		
	I(in.4)	S(in.3)	r(in.)	I(in.4)	S(in.3)	r(in.)
P1000	.556	.185	.202	.577	.236	.290
P5500	.726	.523	.391	.848	.335	.412
P1001	1.112	.930	.572	.915	.472	.580
P5501	1.453	2.811	1.153	1.391	.669	.824
P5001	1.794	5.578	1.716	1.864	.719	.884

B-LINE SYSTEM:

Area (sq.in.)	Axis X-X			Axis Y-Y		
	I(in.4)	S(in.3)	r(in.)	I(in.4)	S(in.3)	r(in.)
B22	.559	.1850	.2042	.580	.2340	.2880
B12	.727	.5302	.3927	.852	.3306	.4068
B22A	1.118	.9379	.5772	.924	.4681	.5761
B12A	1.453	2.8132	1.1541	1.402	.6611	.8137
B11A	1.794	6.2139	1.9120	1.876	.8542	1.0513
7. Telespar drop tubing shall be rolled from 12 ga. hot rolled steel, conforming to ASTM 570, Grade C, pickled and oiled. Finish shall be per note 5 above. Inner tube shall be 1-1/2" sq. and outer tube 1-3/4" sq.
8. Where framing system is used for support of equipment, verify all aspects of installation with equipment manufacturer and architectural layout.

CORROSION PROTECTION

1. All metal components, such as screws, anchor bolts, nuts, clamps, unistrut, etc., that are exposed to weather must be galvanized to inhibit corrosion.
2. This requirement does not apply to stainless steel or aluminum components.

ADHESIVE ANCHOR RODS, DOWELS AND REBARS

1. Chemical anchor systems:
A. Concrete: Use only adhesive anchor systems that have been issued an ICC-ES report in accordance with the provisions of ICC-ES AC308. Anchor system should be approved for use in cracked concrete and Seismic Design Categories A-F per Section 2.0 of the ICC-ES Evaluation Services Report. Anchor systems shall be installed per the requirements of the ICC-ES evaluation services report for the specific anchor and as required by the manufacturer.
B. Grout-Filled Masonry Units: Use only adhesive anchor systems that have been issued an ICC-ES report in accordance with the provisions of ICC-ES AC508, and have passed optional creep tests described in Section 4.4.3 of AC508. Anchor systems shall be installed per the requirements of the ICC-ES evaluation services report for the specific anchor and as required by the manufacturer.
C. Anchors and Dowels Installed into Hollow Masonry Units and Unreinforced Brick Masonry (URM): Use screens as specified by the manufacturer. Embedment depth for anchors shall be per the applicable ICC-ES Evaluation Services Report.
2. Anchor Rods:
All rods shall be ASTM A36 threaded rods with ASTM A 563 Grade A nuts and ANSI B18.22.1 type A washers, unless otherwise noted. Anchors designated as ASTM A193 Grade B7 threaded rods shall use ASTM 563 Grade DH heavy hex nuts and ASTM F436 washers.
3. Dowels: ASTM A615 Grade 60 reinforcing steel.
4. Reinforcement bars: ASTM A615 Grade 60 steel.
5. Remove grease, oil, rust and any other laitance from rods and dowels prior to installation.
6. Special inspection requirements will be dictated by Section 4.0 of the ICC-ES Evaluation Services Report. Any special inspection shall verify anchor type anchor dimensions, concrete type, concrete compressive strength, hole dimensions, anchor spacings, edge distances, slab thickness, anchor embedment, and tightening torque.
7. The tension testing of the chemical anchors shall be done in the presence of the special inspector and a report of the test results shall be submitted to the enforcement agency. If any anchors fail the tension-testing requirements, the additional testing requirements shall be acceptable to the enforcement agency.
8. Test quantity of anchors as noted below:

Application	Quantity
Structural	100% of bolts
Non-structural	50% of bolts
Sill plate bolting	10% of bolts
9. Anchors to be tested shall be selected at random by the special inspector.
10. Where adhesive anchor systems are used to install reinforcing dowel bars in hardened concrete, only 25% of the dowels need be tested if the following conditions are met:
A. The dowels are used exclusively to transmit shear forces across joints between existing and new concrete;
B. The number of dowels in any one member equals or exceeds 12;
C. The dowels are uniformly distributed across seismic force resisting members (such as shear walls, collectors and diaphragms).
11. Testing of shear dowels across cold joints in slabs on grade where the slab is not part of the lateral force-resisting system is not required.
12. Replace anchors and dowels that fail during testing and retest. If more than 10% of the tested dowels and anchors fail to achieve the specified test load, test 100% of the dowels and anchors installed within the last 2 days of anchor installation.
13. A hydraulic cylinder shall be used to apply the tension test load to the anchor. The testing device shall not restrict the concrete shear cone type failure mechanism from occurring.
14. The following criteria apply for the acceptance of installed anchors:
A. Hydraulic ram method: Per CBC 2013 1913A.7.4 Anchor tested with a hydraulic jack or spring loaded devices shall maintain the test load for a min. of 15 seconds and shall exhibit no discernible movement during the tension test, e.g. as evidenced by loosening of the washer under the nut.
15. If any anchor fails testing, test all anchors of the same type, installed by the same trade, not previously tested until twenty (20) consecutive anchors pass, then resume the initial test frequency.
16. All holes for post-installed anchors shall be drilled, cleaned and prepared in accordance with manufacturer's recommendations and the applicable ICC-ESR. Where an anchor does not set properly, or fails a tension test, or reinforcement is encountered during drilling, the drilled hole may not be reused. Abandoned holes shall be filled with non-shrink grout. The minimum spacing between an abandoned hole and a drilled hole used for a post-installed anchor shall not be less than 1-1/2 anchor embed. length unless otherwise approved by the enforcement agency. If the anchor or dowel may not be shifted as noted above, the structural Engineer of Record will determine a new location.
17. Locate reinforcement and confirm final anchor locations prior to fabricating plates, members, or other steel assemblies attached with adhesive anchors.
18. Required test loads are called out at details. Test acceptance criteria shall be per Section 1913A.7 of CBC 2013.
19. Testing shall occur a minimum of 24 hours after installation of the subject anchors.

ABBREVIATIONS

Ø	Diameter	Intr.	Interior
#	Number or pounds	Jt.	Joint
@	At	K.O.	Knockout
A.B.	Anchor Bolt	L	Angle
AFF	Above Finish Floor	LLH	Long Leg Horizontal
ALT.	Alternate	LLV	Long Leg Vertical
Anch.	Anchor	LB.	Pound
B.O.F.	Bottom of Footing	L.T. WT.	Lightweight
Bm.	Beam	M.B.	Machine Bolt
Bott.	Bottom	Max.	Maximum
Btwn.	Between	Mech.	Mechanical
C.G.	Central Gravity	Mfr.	Manufacturer
C.I.P.	Cast In Place	Min.	Minimum
CL	Center line	Mtl.	Metal
Clr.	Clear	(N)	New
Col.	Column	N.I.C.	Not in Contract
Conc.	Concrete	N.S.	Nelson Stud
Conn.	Connection	N.T.S.	Not to Scale
Cont.	Continuous	No.	Number
CRC	Cold Rolled Channel	N. WT.	Normal Weight
Dbl.	Double	O.C.	On Center
Det.	Detail	O.F.	Outside Face
Dia.	Diameter	O.H.	Opposite Hand
Dim.	Dimension	Opn'g.	Opening
DP	Deep	PDF	Powder Driven Fastener
Dwg.	Drawing	P.H.	Penthouse
Dwl.	Dowel	PL	Plate
(E)	Existing	Plcs.	Places
E.F.	Each Face	Reinf.	Reinforcing
Eq.	Equal	Req'd.	Required
E.S.	Each Side	Sched.	Schedule
E.W.	Each Way	Sect.	Section
Ea.	Each	Sep'n.	Separation
EL	Elevation	Sim.	Similar
Electl.	Electrical	SMS	Sheet Metal Screw
Elev.	Elevator or Elevation	Spec.	Specification
Equiv.	Equivalent	Sq.	Square
Exist.	Existing	Std.	Standard
Exp.	Expansion	Stiff.	Stiffener
Extr.	Exterior	Stl.	Steel
Flg.	Flange	Suppt.	Support
F.D.	Floor Drain	Supt'g.	Supporting
F.O.	Face of	Sym.	Symmetrical
F.O.C.	Face of Concrete	T&B	Top and Bottom
F.O.S.	Face of Stud	T.O.	Top of
F.O.W.	Face of Wall	T.O.F.	Top of Footing
Fdn.	Foundation	T.O.P.	Top of Parapet
Fin.	Finish	T.O.S.	Top of Steel
Flr.	Floor	T.O.W.	Top of Wall
Frmg.	Framing	T.S.W.	Top Seam Weld
Ft.	Feet	Thk.	Thick
Ftg.	Footing	Typ.	Typical
Ga.	Gauge	U.N.O.	Unless Noted Otherwise
Galv.	Galvanized	V.O.J.	Verify on Job
GLB	Glu Lam Beam	V.O.S.	Verify on Site
Gr. Bm.	Grade Beam	Vert.	Vertical
Hgr.	Hanger	w/	With
Horiz.	Horizontal	W.P.	Work Point
H.S.B.	High Strength Bolt	Wt.	Weight
Ht.	Height	WWF	Welded Wire Fabric
I.F.	Inside Face		

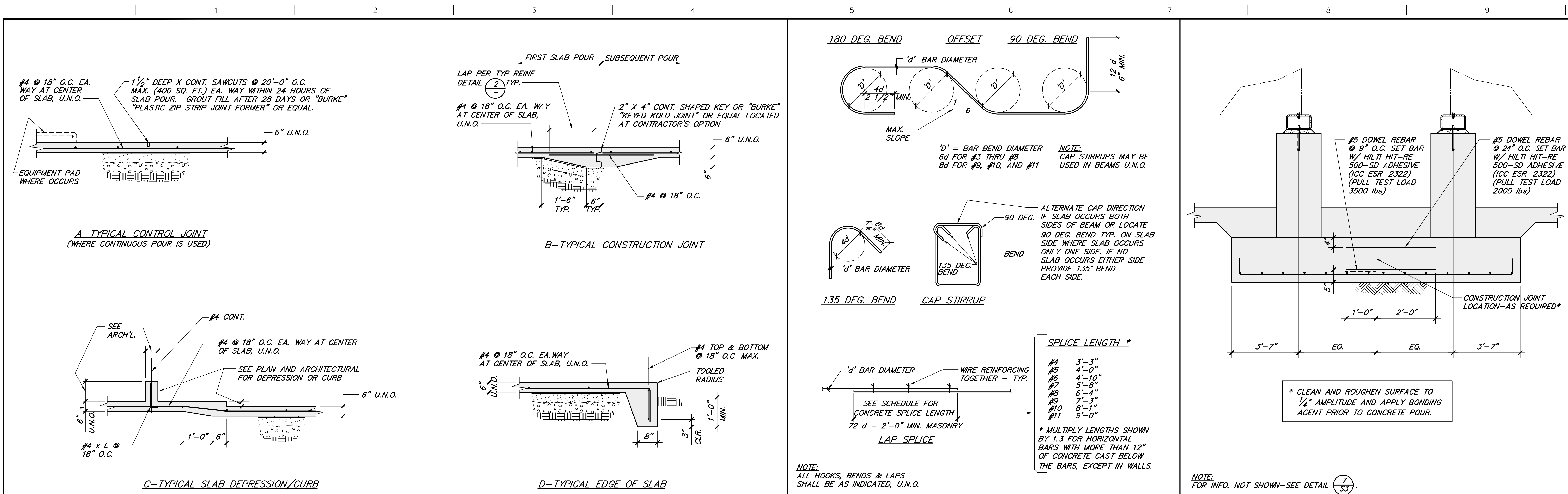
THE COOLING TOWER/HVAC SYSTEMS SHALL BE FUNCTIONAL BETWEEN 7:00AM TO 8:00PM. ALL CRITICAL PATH OF THE SYSTEM, I.E. MAIN PIPING SHALL BE DEMOLISHED & REPLACED WITHIN ALLOTTED TIME. ONLY ONE PUMP AND COOLING TOWER SHALL BE DOWN AT ANY TIME.

SHEET INDEX	
STRUCTURAL	
S-1	GENERAL NOTES, SHEET INDEX
S-2	PARTIAL PLAN, DETAILS AND SECTIONS
S-3	DETAILS AND SECTIONS
S-4	DETAILS AND SECTIONS
TOTAL: 4	

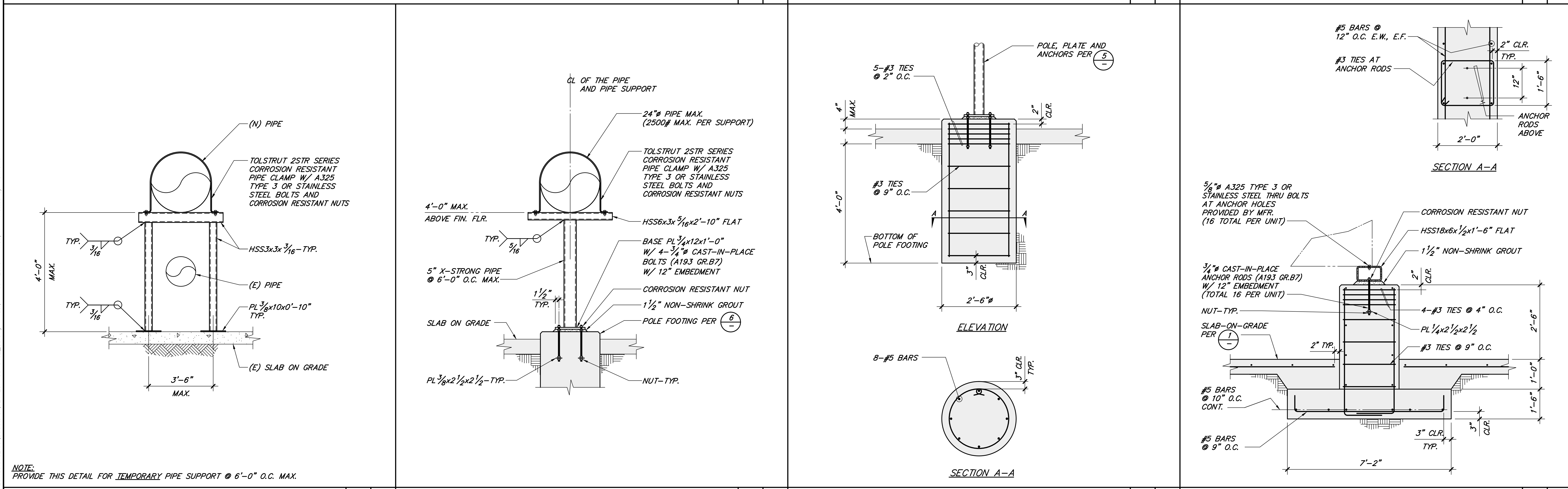
ARCHITECT/ENGINEERS		Schwab Engineering & Management A Certified SB/DVBE Firm 1000 E. Walnut Street, Suite 227, Pasadena, CA 91106 t: 888.900.3023 f: 626.463.2739 www.schwabeng.com Project No.: 0214.257.00		REGISTERED PROFESSIONAL ENGINEER EXAM (EX-03) No.5145 10/03/06 STRUCTURAL STATE OF CALIFORNIA		Drawing Title GENERAL NOTES SHEET INDEX	Project Title BUILDING 40 - SEPULVEDA REPLACEMENT COOLING TOWER	Project Number 691A4-14-110SM Building Number 40	Office of Facilities Management Department of Veterans Affairs		
Approved Project Engineer/Architect		Location 16111 PLUMMER ST. NORTH HILL, CA 91343		Drawing Number S-1 Dwg. 2 of 19		Chief, Project Section		Date July 7, 2015	Checked BA	Drawn AS	
Revisions		Date									

three inches = one foot
one and one half inches = one foot
one inch = one foot
three quarters inch = one foot
one half inch = one foot
three eighths inch = one foot
one quarter inch = one foot
one eighth inch = one foot
one eighth inch = one foot

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TYPICAL SLAB ON GRADE DETAILS N.T.S. 1 TYPICAL REINFORCING DETAILS N.T.S. 2 COOLING TOWER SUPPORT DETAIL N.T.S. 3



TEMPORARY PIPE SUPPORT DETAIL N.T.S. 4 PERMANENT PIPE SUPPORT DETAIL N.T.S. 5 POLE FOOTING DETAIL N.T.S. 6 COOLING TOWER SUPPORT DETAIL N.T.S. 7

Revisions

Date

ARCHITECT/ENGINEERS

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Project No.: 0214.257.00

REGISTERED PROFESSIONAL ENGINEER
EXAM (EXERCISE)
No. 5145
10/30/16
STATE OF CALIFORNIA

Drawing Title
DETAIL AND SECTIONS

Approved Project Engineer/Architect

Chief, Project Section

Project Title
BUILDING 40 - SEPULVEDA REPLACEMENT COOLING TOWER

Location
16111 PLUMMER ST. NORTH HILL, CA 91343

Date
July 7, 2016

Checked
BA

Drawn
AS

Project Number
691A4-14-110SM

Building Number
40

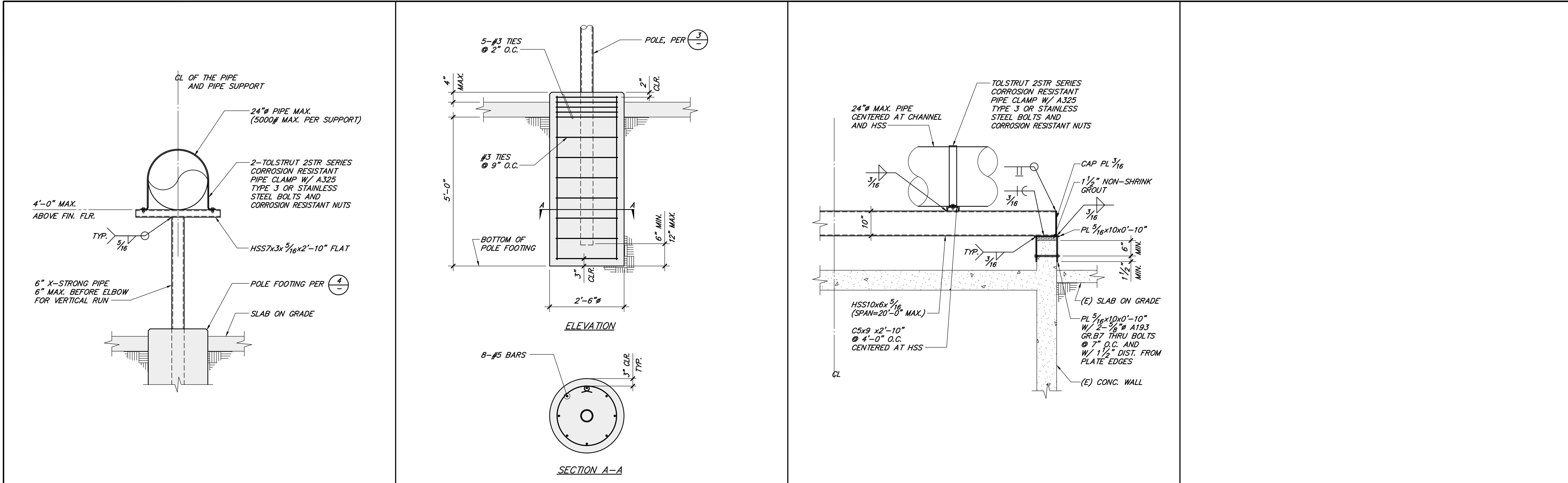
Drawing Number
S-3

Dwg. 4 of 19

Office of Facilities Management

Department of Veterans Affairs

one eighth inch = one foot
one quarter inch = one foot
three eighths inch = one foot
one half inch = one foot
three quarters inch = one foot
one inch = one foot
one and one half inches = one foot
two inches = one foot
three inches = one foot



PERMANENT LAST PIPE SUPPORT (BEFORE VERT. RUN)	N.T.S.	1	POLE FOOTING FOR LAST SUPPORT (BEFORE VERT. RUN)	N.T.S.	2	PIPE SUPPORT BEAM DETAIL	N.T.S.	3	NOT USED	-	4
NOT USED	-	5	NOT USED	-	6	NOT USED	-	7	NOT USED	-	8

ARCHITECT/ENGINEERS Schwab Engineering & Management A Certified SB/DVBE Firm 1000 E. Walnut Street, Suite 227, Pasadena, CA 91106 t: 888.900.3523 f: 626.463.2739 www.schwabeng.com Project No.: 0214.257.00				Drawing Title PARTIAL PLAN, DETAILS AND SECTIONS		Project Title BUILDING 40 - SEPULVEDA REPLACEMENT COOLING TOWER		Project Number 691A4-14-110SM Building Number 40		Office of Facilities Management	
Revisions				Approved Project Engineer/Architect		Location 16111 PLUMMER ST. NORTH HILL, CA 91343		Drawing Number S-4		Department of Veterans Affairs	
Date				Chief, Project Section		Date July 7, 2015		Checked BA		Drawn AS	