

EAST ENERGY CHILLER 1 COOLING TOWER ADDITION STATE PROJECT H27-1969

COLUMBIA, SC

CONSTRUCTION DOCUMENTS

DRAWING INDEX

GENERAL

T1 TITLE SHEET

STRUCTURAL

S1.0 COOLING TOWER LOCATION PLAN
S2.0 DETAILS

MECHANICAL

M-1 MEZZANINE LEVEL PLAN
M-2 ROOF PLAN
M-3 SCHEDULES AND NOTES

ELECTRICAL

E1.0 ROOF ELECTRICAL PLAN

**CAMPUS PLANNING
AND CONSTRUCTION**
 COLUMBIA, SC 29208

SEAL

CHECKED BY:

DATE

DRAWN BY:

DATE

DESCRIPTION

DRAWING:

REV.

BUILDING:

REV.

PROJECT TITLE:

SHEET:

OF

SHEET IN SET:

OF

OF

OF

OF

OF

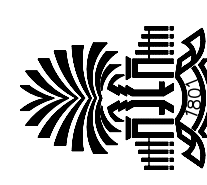
OF

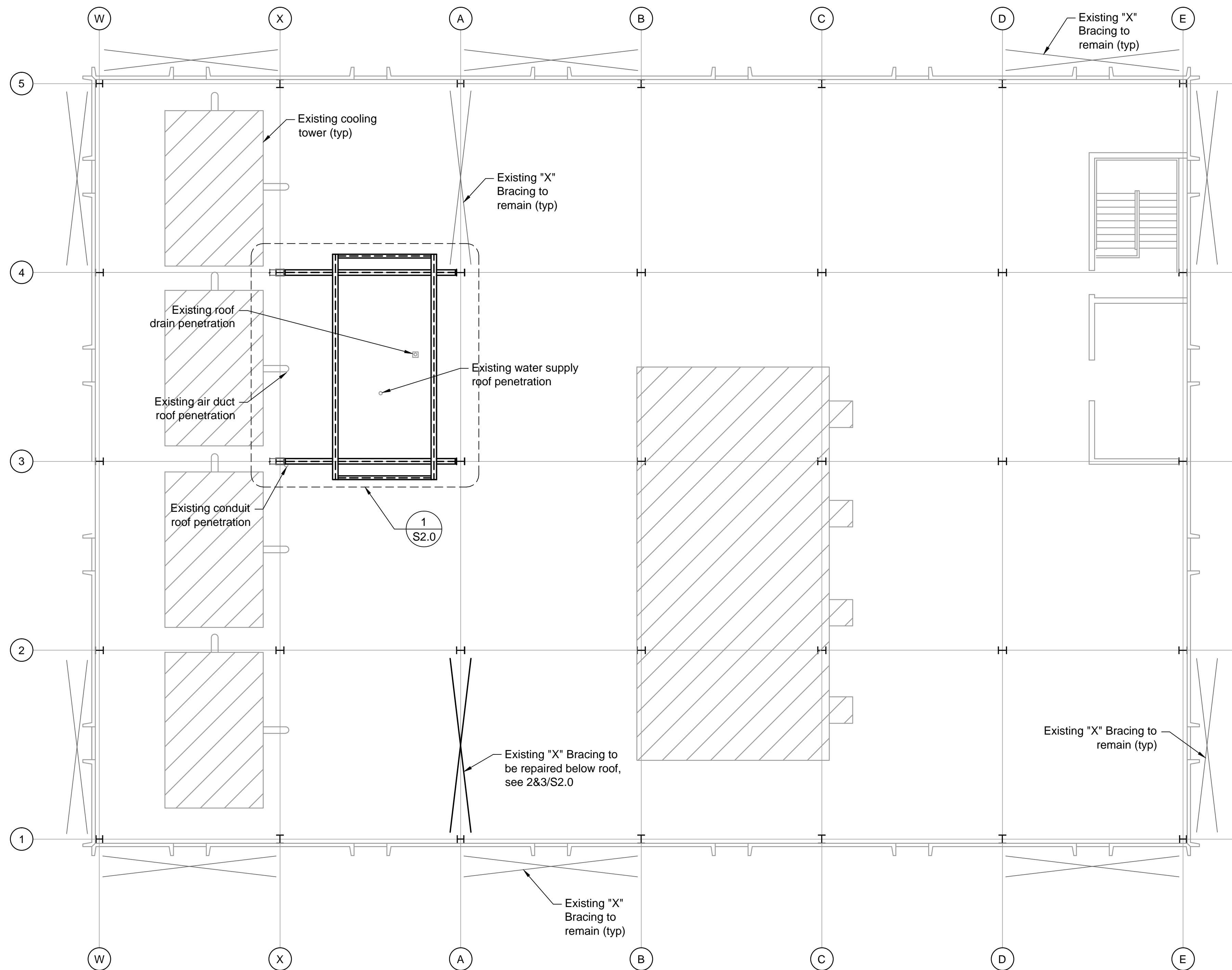
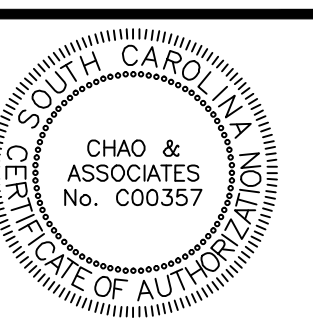
OF

OF

EAST ENERGY CHILLER 1
 COOLING TOWER ADDITION
 STATE PROJECT NO.: H27-1969

University of South Carolina





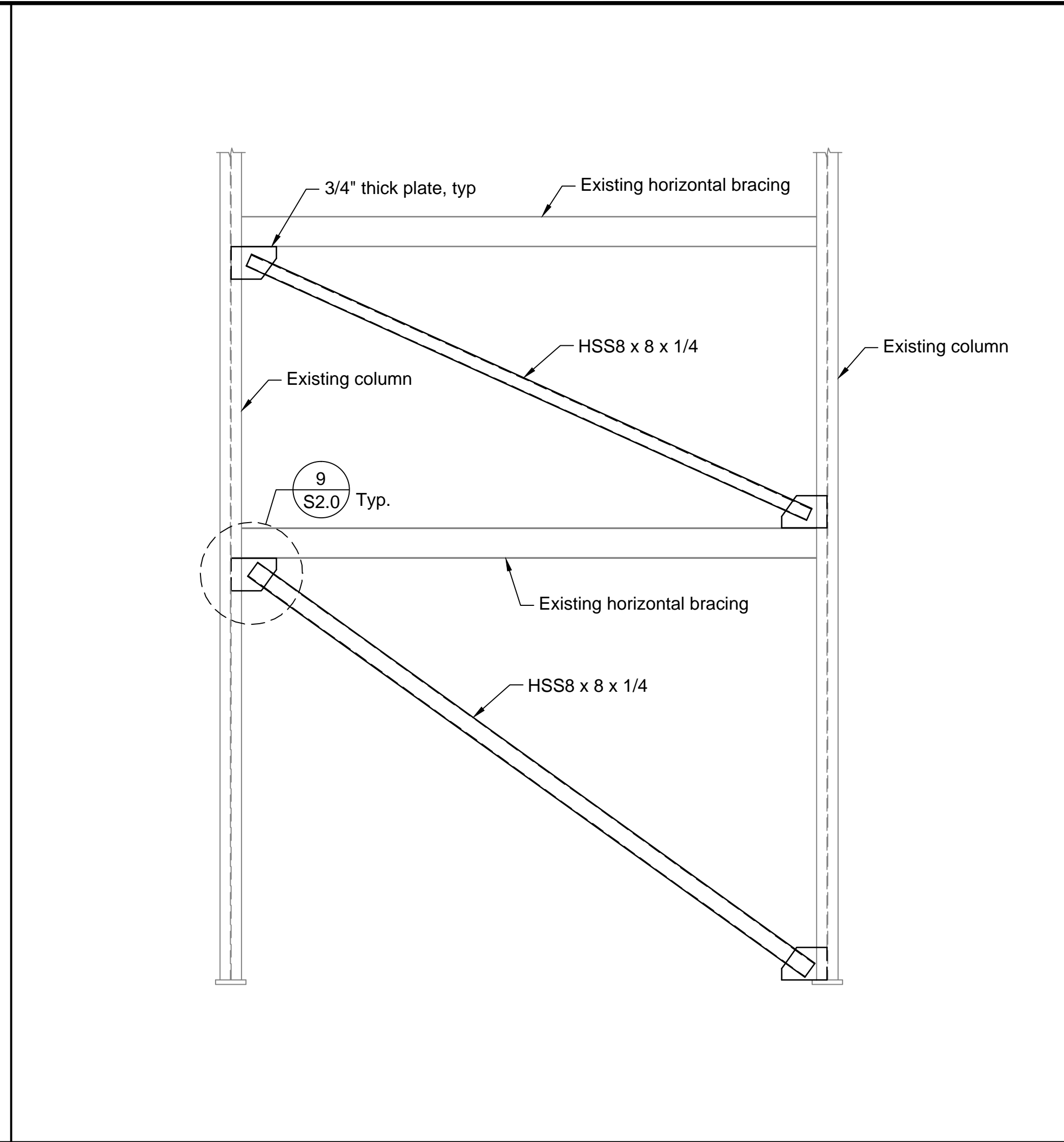
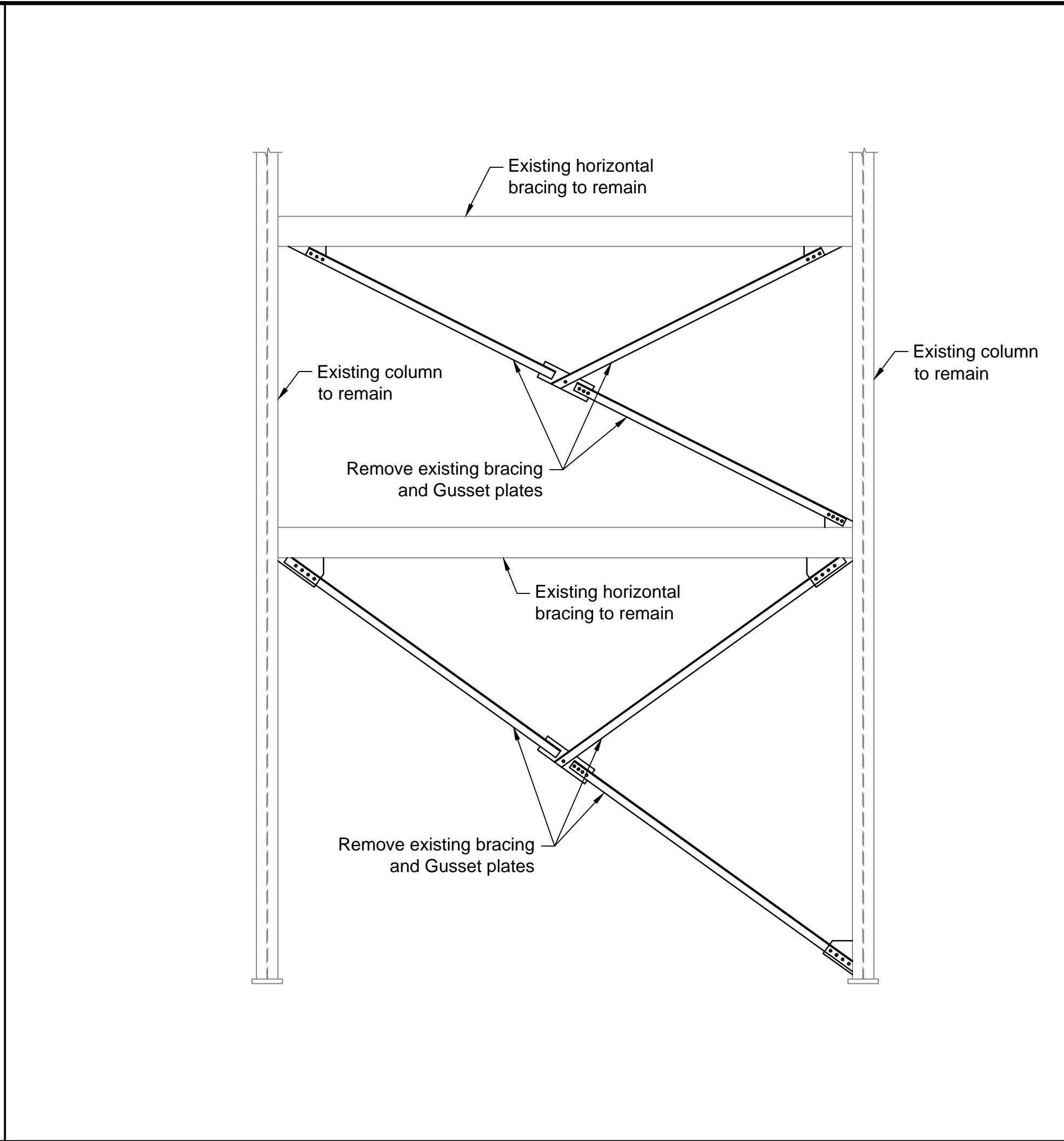
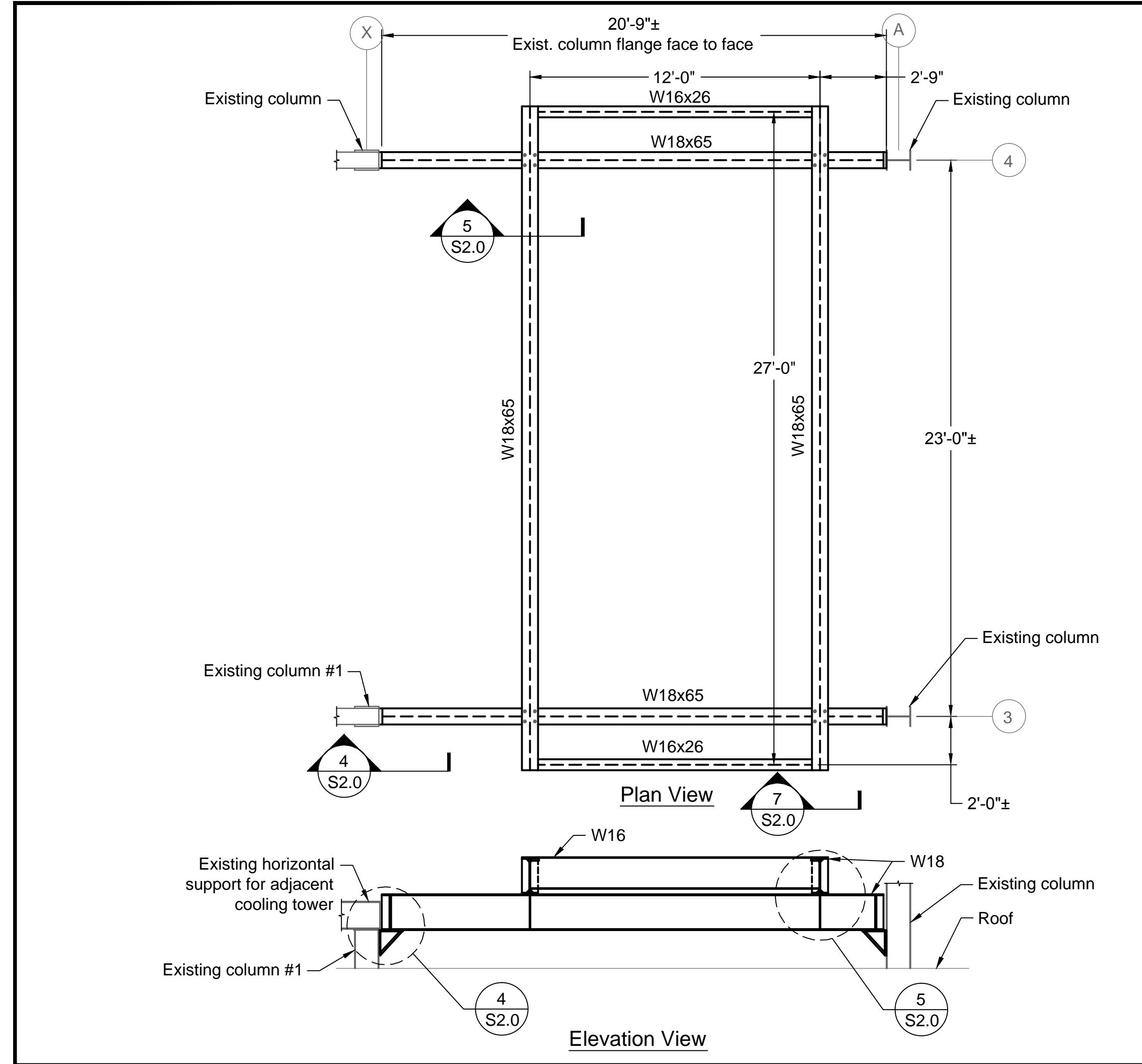
Cooling Tower Location Plan
Scale: 1/8" = 1'-0"

General Notes:

- Design Specifications: International Building Code (2009 Edition).
Design Loads:
Snow load: 10 PSF
Floor live load: Office with fixed partition: 50 PSF
Storage (Light Duty): 125 PSF
File Room: 150 PSF
Balconies: 100 PSF
Dead load: Actual
Wind Velocity: 95 MPH
Exposure Category: B
Building Occupancy Category: II
Seismic Use Group: I
Mapped Spectral Response Accelerations: Ss=0.553 g, S1=0.149 g
Site coefficients: Fa=1.358, Fv=2.204
Seismic design category: D
Basic seismic resistance system: Building frame systems
Existing steel concentrically braced frames
Response modification factor: (R): 3 1/2
Deflection amplification factor:(Cd): 3 1/4
Seismic Analysis Procedure: Equivalent lateral force procedure.
- The construction falsework design (if any) is the responsibility of the Contractor.
- Where a detail is shown on Structural Drawings for one condition, it shall apply to all similar or like conditions, unless noted or shown otherwise on plans.
- All items shall be tightly anchored or attached square, plumb, and true, or in other planes and shapes as shown on the drawings. Joints shall be tight, even, and free of offsets. No field altering of any members will be allowed that will cause them not to be in accordance with the drawings and specifications, without written approval of the Project Engineer.
- The dimensions shown with a suffix "±" are approximate and shall be verified by the Contractor before fabrication.
- If the Contractor finds a difference between these drawings & existing conditions, or finds any other conditions which prohibit execution of the work as directed in these drawings, the Contractor shall notify the Engineer immediately.
- The Contractor shall employ a laboratory to perform the quality assurance, sampling, testing and/or inspection at his expense. Final selection of such laboratory shall be approved by the Engineer.
- Any revision/modification to the original design during the shop drawing process, the Contractor shall clearly cloud line all the changes and shall receive approval from the Engineer in writing before fabrication. Any costs associated with correcting the unapproved change shall be at the Contractor's expense.

Structural and Miscellaneous Steel

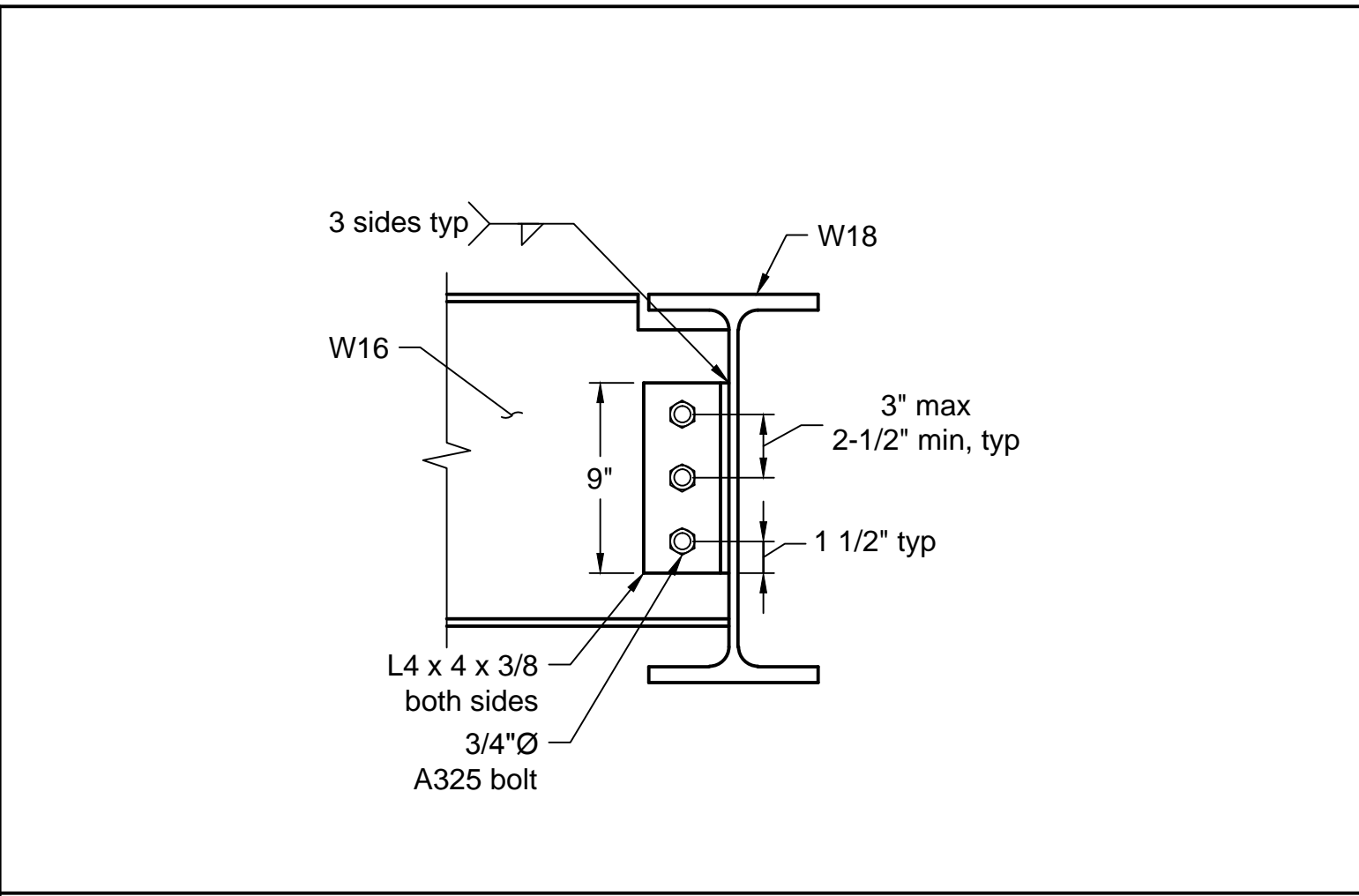
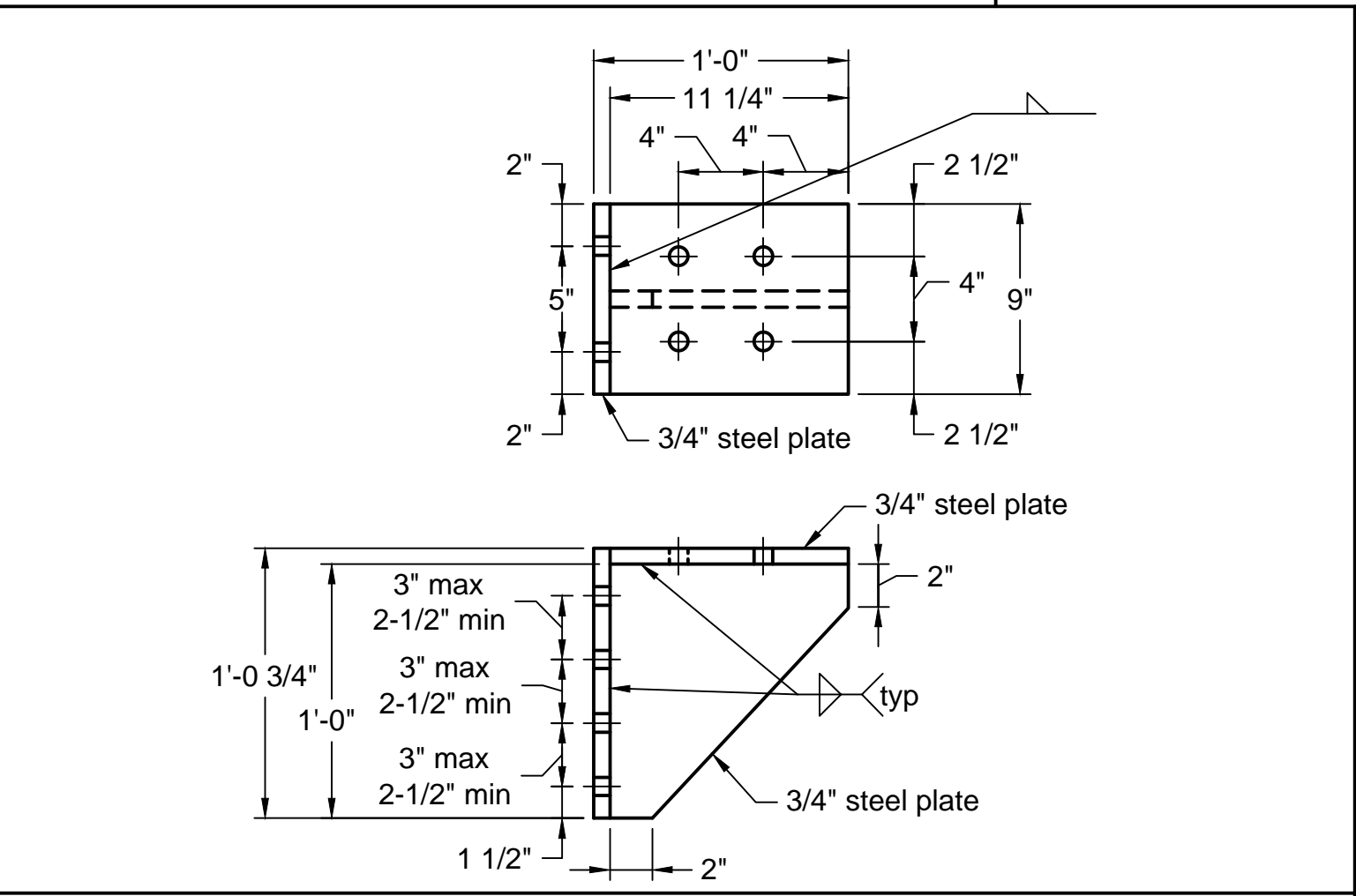
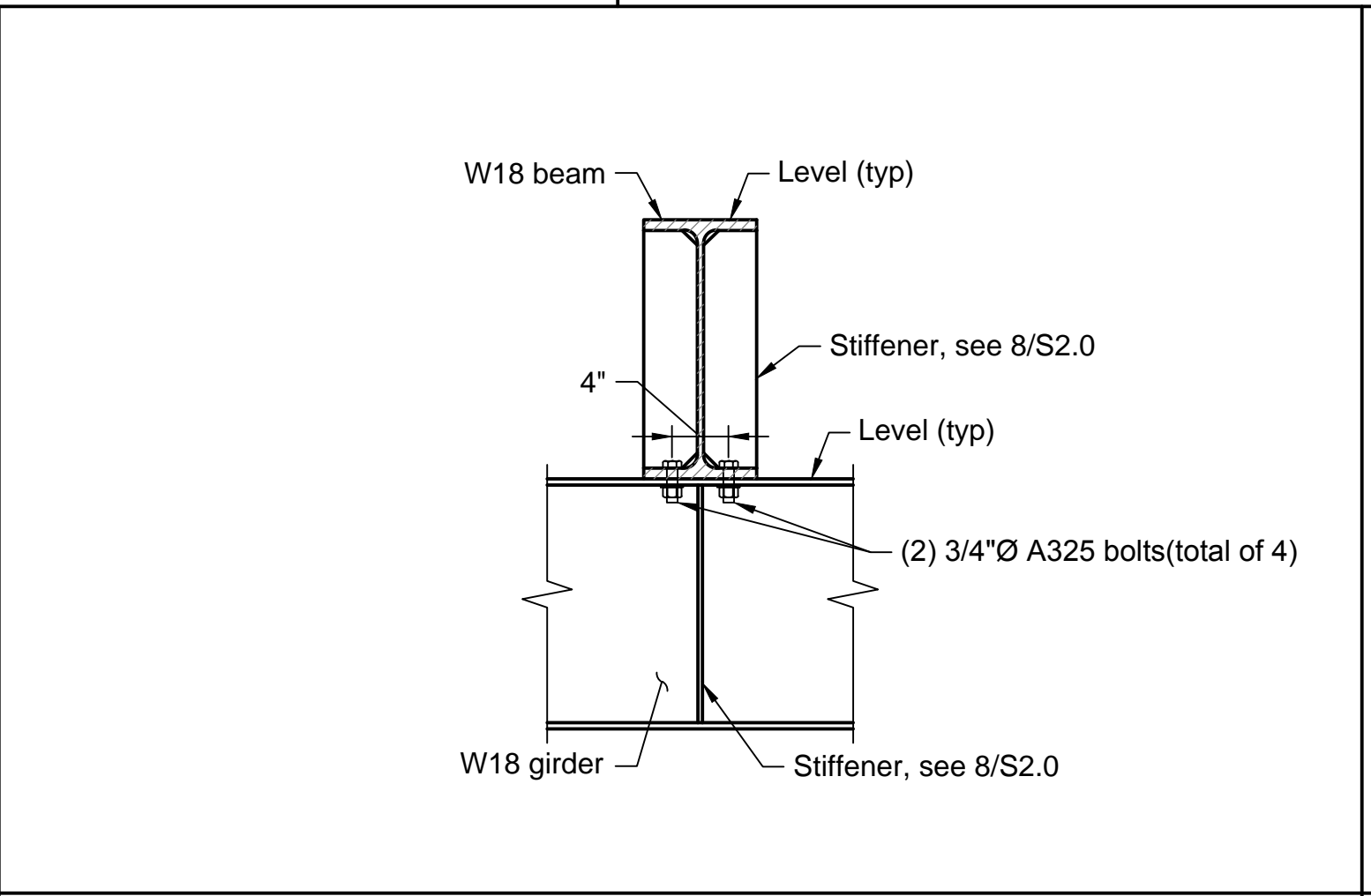
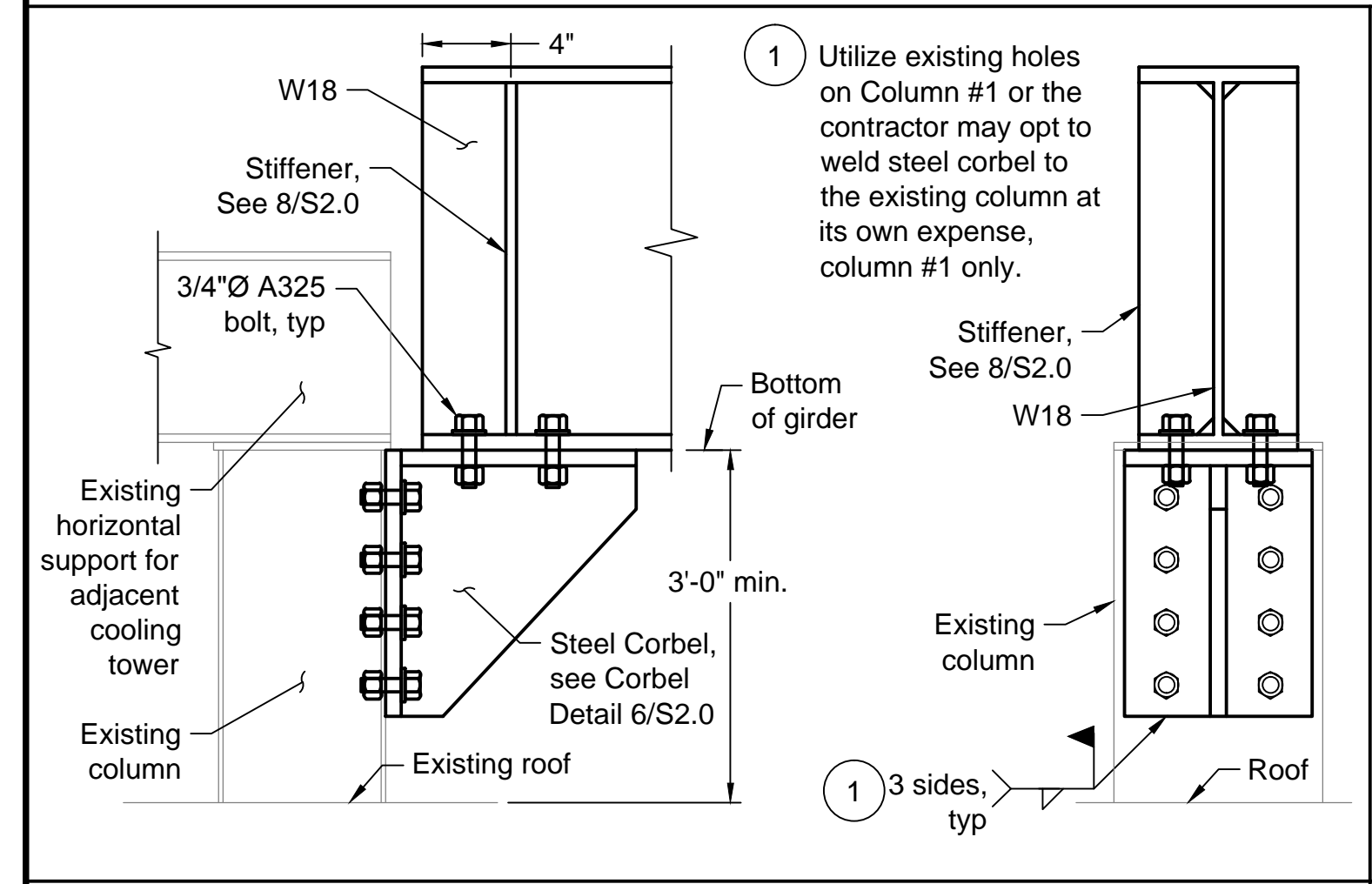
- All structural and miscellaneous steel shall conform to the Thirteenth Edition of the AISC "Specification for the Design, Fabrication & Erection of Structural steel for Buildings" and all its supplements, and to the AISC "Code of Standard Practice for Steel Buildings and Bridges".
- All structural steel shall conform to ASTM A-36, FY=36,000 PSI unless otherwise noted.
- Steel W-Shapes shall conform to ASTM A992, FY=50,000 PSI.
- All rectangular or square steel HSS-Shapes shall conform to ASTM A500 grade B, FY=46,000 PSI. All round steel HSS-Shapes shall conform to ATSM A500 grade B, FY=42,000 PSI.
- All welded connections shall be done with E70XX electrodes with 3/16" min. material. All welding shall comply with AWS D1-1 structural welding code the latest edition.
- All bolts shall be A325 bolts, unless otherwise noted.
- The structural steel shall have one coat of anti-rust paint and one coat of finish paint of color determined by the owner. Prior to painting, all steel surfaces shall be prepared in accordance with SSPC-SP3. All paints shall be approved by the Owner/Architect prior to their use.
- Fabrication and assembly of bolted connections shall comply with applicable sections of AISC "Specification for Structural Joints using ASTM A325 or A490 bolts."
- No openings in beams shall be permitted without the written permission of the engineer.
- The use of a gas-cutting torch in the field for cutting holes or for correcting fabrication errors will not be permitted on structural framing members except with the written approval of the Engineer for each specification.
- An independent inspection agency shall be employed by the contractor and approved by the engineer to inspect the structural steel in the field and verify that it conforms to the requirements of the contract documents.



1 - Cooling Tower Support Framing Scale: 1/4" = 1'-0"

2 - Bracing and Gusset Demolition Plan Scale: 1/4" = 1'-0"

3 - Bracing and Gusset Replacement Plan Scale: 1/4" = 1'-0"

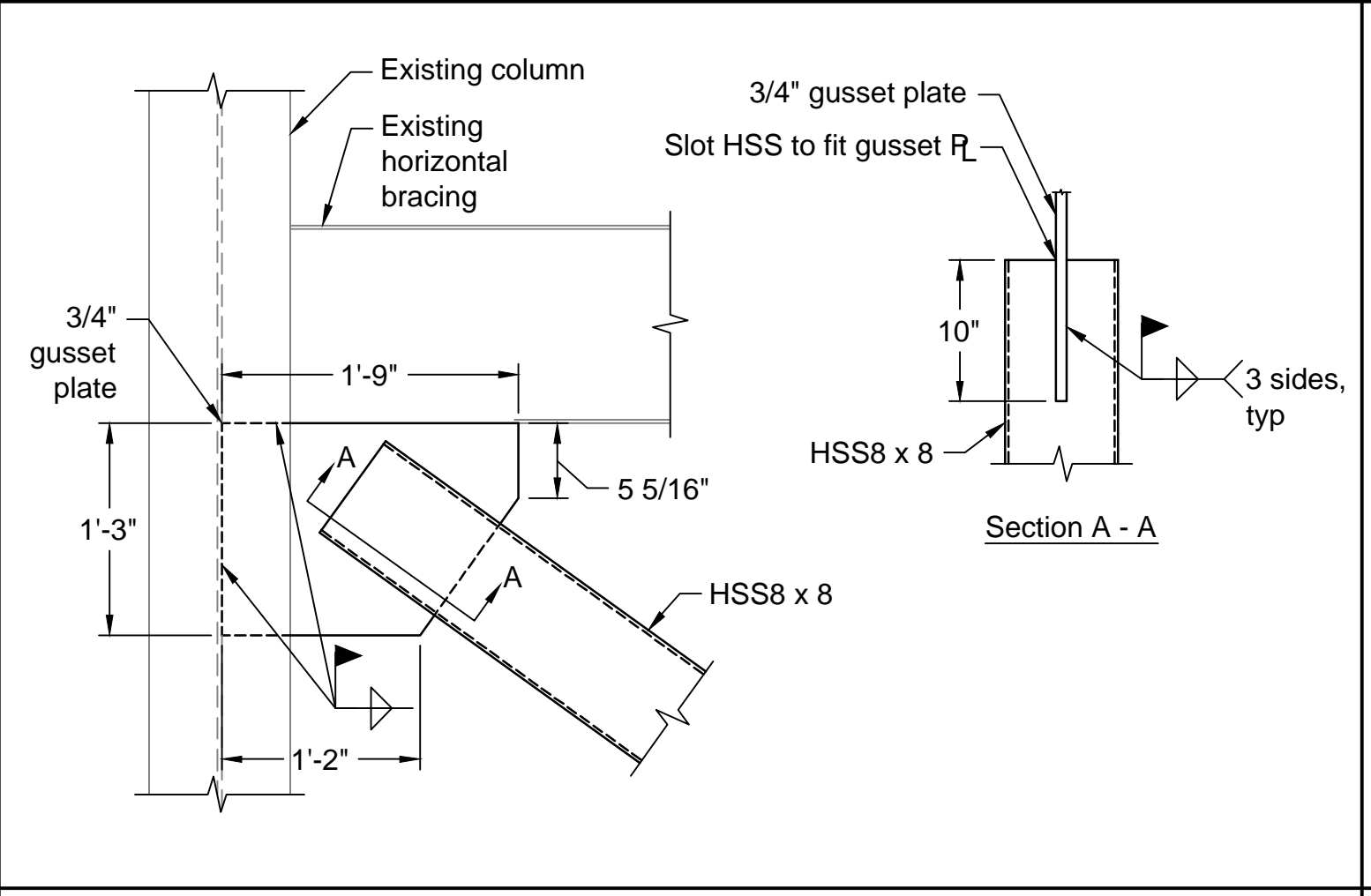
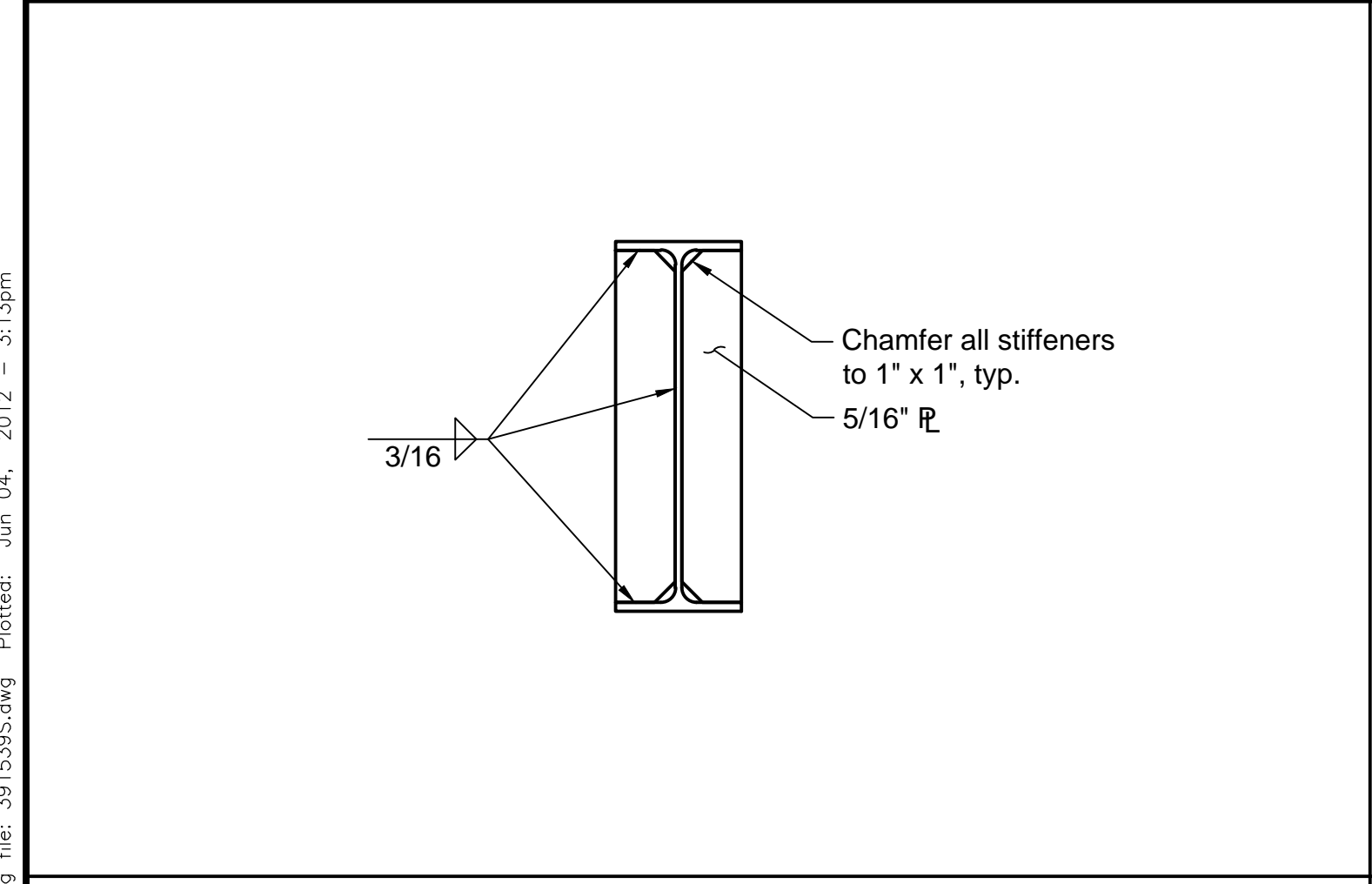


4 - Typical Corbel Connection Detail Scale: 1-1/2" = 1'-0"

5 - Girder to Beam Connection Scale: 1" = 1'-0"

6 - Corbel Detail Scale: 1-1/2" = 1'-0"

7 - Section Scale: 1-1/2" = 1'-0"

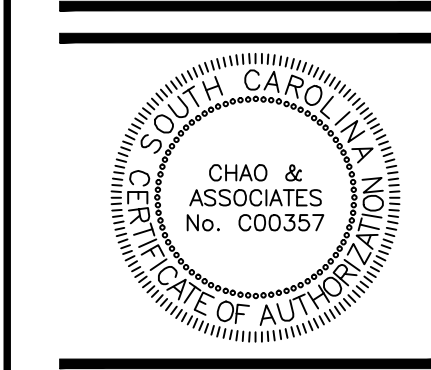


8 - Typical Stiffener Detail Scale: 1-1/2" = 1'-0"

9 - Bracing and Gusset Assembly Scale: 1" = 1'-0"



Chao & Associates, Inc.
Civil - Structural - Survey
7 Clusters Court
Columbia, SC 29210
Voice: (803) 772-8420
Fax: (803) 772-9120
Email: consult@chaoinc.com

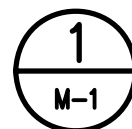
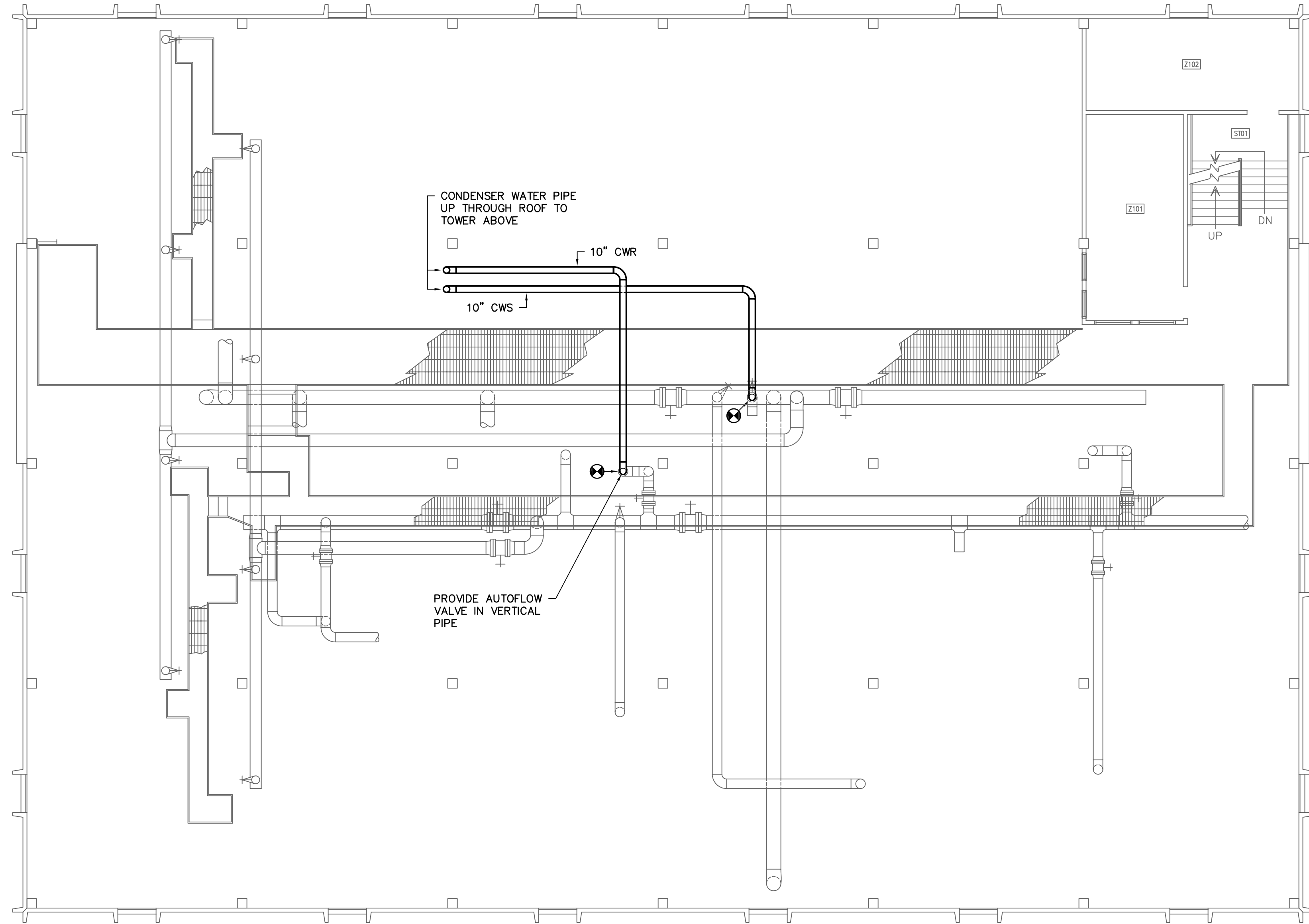


USC East Energy Cooling Tower
Prepared for:
The University of South Carolina
Columbia, SC

Drawn: MAB Checked: DC
Revised:
Project No.: 391539-11
File: 391539S.dwg

S2.0
Sheet Number
June 4, 2012
Date

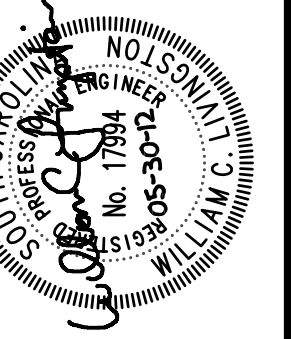
Drawing file: 391539S.dwg Plotted: Jun 04, 2012 - 3:13pm



MEZZANINE LEVEL PLAN

SCALE: 1/8" = 1'-0"

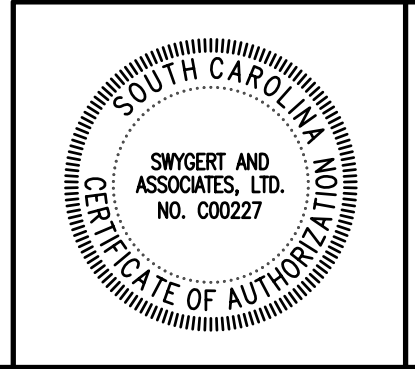
CAMPUS PLANNING
AND CONSTRUCTION
COLUMBIA, SC 29208



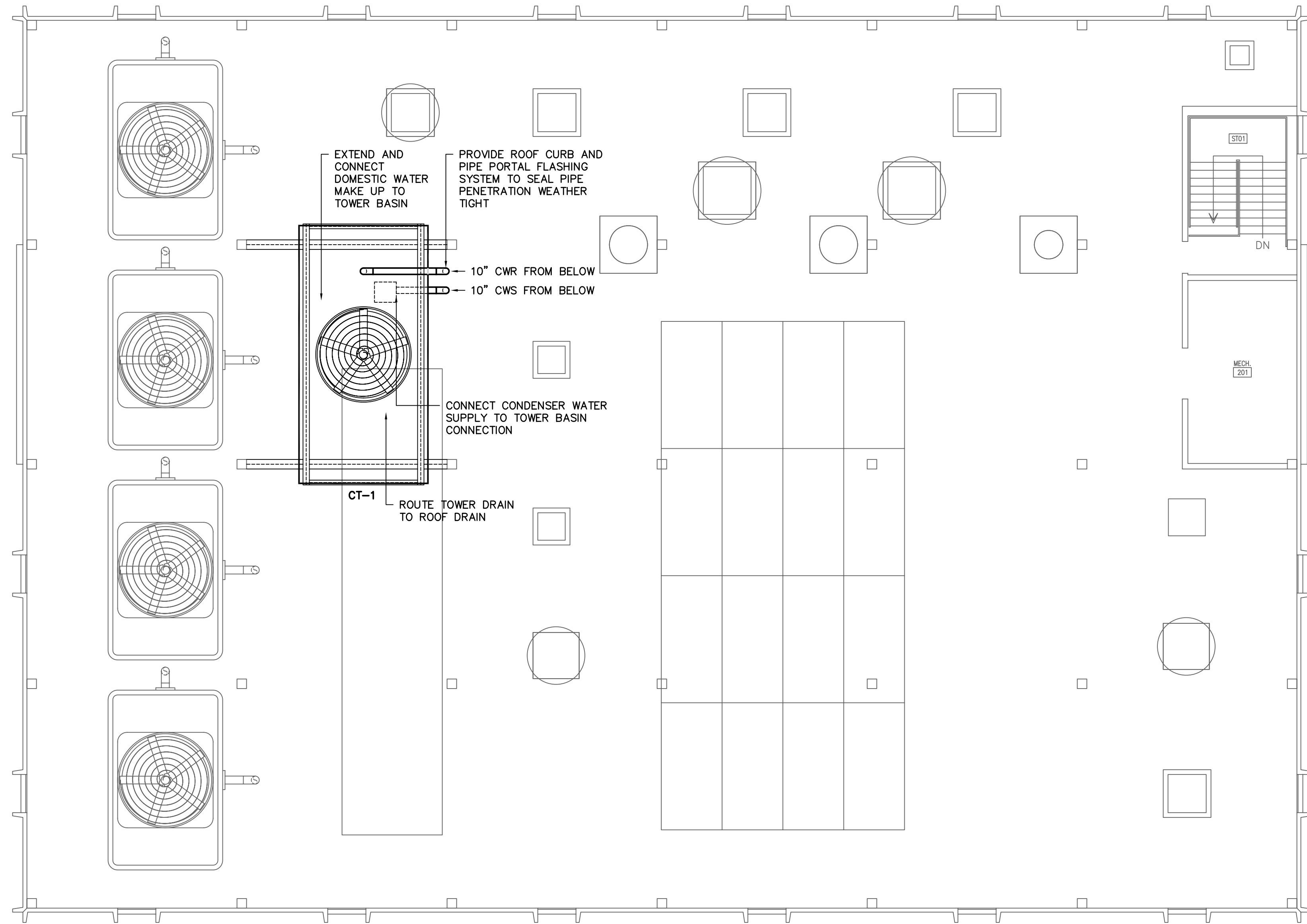
BUILDING	DRAWING	DATE	DRAWN BY	DEM	CHECKED BY
REV.	NO.		DESCRIPTION	DATE	WCL
	CP00331757	30MAY12			

PROJECT TITLE:
EAST ENERGY CHILLER 1
COOLING TOWER ADDITION
STATE PROJECT NO.: H27-1969
University of South Carolina

SHEET:
M-1
OF 3
SHEET IN SET:
OF

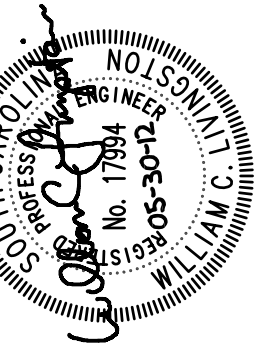


Swygert & Associates
CONSULTING ENGINEERS
DBA Swygert & Assoc., Ltd. Telephone: (803) 791-9300
Post Office Box 11686 Fax: (803) 791-9830
Columbia, S.C. 29211 mail@swygert-associates.com



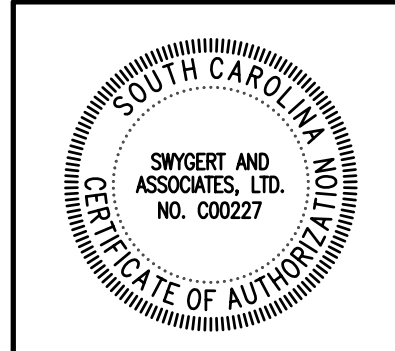
1 ROOF PLAN
 M-2 SCALE: 1/8" = 1'-0"

CAMPUS PLANNING
 AND CONSTRUCTION
 COLUMBIA, SC 29208



BUILDING:	DRAWING:	DATE:	DRAWN BY:	DEM DATE:	CHECKED BY:
REV.	CP00331757	30MAY12	WCL		

PROJECT TITLE:
 EAST ENERGY CHILLER 1
 COOLING TOWER ADDITION
 STATE PROJECT NO.: H27-1969
 University of South Carolina



Swygert & Associates
 CONSULTING ENGINEERS
 DBA Swygert & Assoc., Ltd. Telephone: (803) 791-9300
 Post Office Box 11686 Fax: (803) 791-9830
 Columbia, S.C. 29211 mail@swygert-associates.com

SHEET:
 M-2
 OF 3
 SHEET IN SET:
 OF

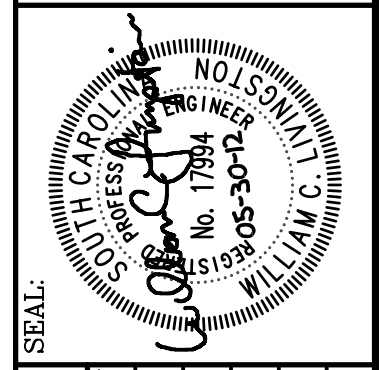
COOLING TOWER SCHEDULE								
TAG	CCS MODEL NO.	ENT. WTR.	LVG. WTR.	GPM	HEAD FT.	ENT. AIR WB	MOTOR H.P.	REMARKS
CT-1	P3K-707	95	85	1,500	20.8	79	30	1,2,3,4
1. PROVIDE CROSSFLOW INDUCED DRAFT TOWER WITH ALL FRP CONSTRUCTION, AND STRUCTURAL CONNECTORS CONSTRUCTED FROM 304 STAINLESS STEEL. 2. PROVIDE BALDOR TEAO ADJUSTABLE SPEED DIRECT DRIVE FAN MOTOR INCLUDING ADJUSTABLE SPEED DRIVE AND SEVERE DUTY RATING. 3. PROVIDE WITH PVC FILL. 4. TOWER MANUFACTURER SHALL PROVIDE ALL ERECTION ON SITE.								

ISOLATION AND SEISMIC SCHEDULE				
OCCUPANCY CATEGORY = I			SEISMIC SITE CLASS = D	
EQUIPMENT TAG	COMPONENT ID	ISOLATION SPECIFICATION	SEISMIC REST. SPECIFICATION	ISOLATION DEFLECTION
COOLING TOWER (ON ROOF)	1.0	SPEC W SPEC K	NOTE 1	.15"
1. ANCHOR BOLTS FOR NON-ISOLATED AND INTERNALLY ISOLATED EQUIPMENT SHALL BE SIZED BY THE SEISMIC RESTRAINT SUPPLIER. IF REQUIRED, SPEC. SL SNUBBERS OR SPEC. SC CABLE KITS SHALL BE PROVIDED. 2. ROOF CURBS PROVIDED BY OTHERS MUST BE CERTIFIED BY A PROFESSIONAL ENGINEER FOR THE REQUIRED SEISMIC LOADS. 3. PADS REINFORCED AND DOWELED IN ACCORDANCE WITH ASHRAE SEISMIC GUIDELINES. 4. DIFFUSERS WEIGHING LESS THAN 20 LBS MUST BE MECHANICALLY ATTACHED TO CEILING GRID, BUT REQUIRE NO ADDITIONAL RESTRAINT.				

- | GENERAL NOTES | |
|--|--|
| 1. VISIT SITE PRIOR TO BIDDING. THIS CONTRACTOR SHALL DETERMINE DIFFICULTY OF INSTALLATION AND REFLECT THIS IN HIS BIDDING. | |
| 2. DO NOT SCALE DRAWINGS. THIS CONTRACTOR SHALL VERIFY ALL EXISTING ITEMS AND LOCATIONS IN THE FIELD. | |
| 3. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS TO AVOID INTERFERENCE. | |
| 4. THIS CONTRACTOR SHALL COORDINATE STEEL AND EQUIPMENT SUPPORT WITH STEEL SHOP DRAWINGS TO CONFIRM DIMENSIONS MATCH WITH EQUIPMENT SUPPLIED. | |
| 5. EXISTING PIPE, DUCTWORK, CONDUIT, ETC THAT INTERFERES WITH THE ROUTING OF NEW SYSTEMS SHALL BE RELOCATED. THIS CONTRACTOR SHALL INCLUDE THE COST OF SUCH IN HIS BID UNLESS NOTED OTHERWISE. | |
| 6. WATER SYSTEMS SHALL BE DRAINED AS REQUIRED FOR INSTALLATION OF WORK. UPON COMPLETION, SYSTEM SHALL BE FILLED WITH WATER AND VENTED OF ALL AIR. | |
| 7. ALL MECHANICAL ITEMS EXTENDING THROUGH ROOF SHALL BE FLASHED AND COUNTERFLASHED. PROVIDE PIPE PORTALS AS REQUIRED FOR PIPING PENETRATIONS THROUGH THE ROOF. COORDINATE WITH ROOFING CONTRACTOR. THIS CONTRACTOR TO FLASH ROOF CURBS AND SEAL TO EXISTING ROOF SYSTEM. | |
| 8. ALL PIPING IS SHOWN DIAGRAMMATIC. HOWEVER, THIS CONTRACTOR SHALL PROVIDE ALL REQUIRED FITTINGS, PIPING AND INSULATION FOR ALL OFFSETS AND/OR CHANGES IN ELEVATION. | |
| 9. EXTEND ALL DRAIN LINES TO NEAREST ROOF DRAIN AS INDICATED - SO Routed AS TO AVOID INTERFERENCE WITH PASSAGEWAYS AND MAINTENANCE. | |
| 10. ALL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE SPECIFICATIONS AND FURTHER SUPPORTS OR HANGERS SHALL BE PROVIDED TO PREVENT WEIGHT OF PIPING BEING PLACED ON EQUIPMENT. | |
| 11. PROVIDE AND INSTALL 3W/FT HEAT TRACE TAPE ON ALL EXTERIOR WATER PIPING. | |
| 12. PROVIDE FOR ACCESS TO ALL EQUIPMENT REQUIRING CLEANING OR ADJUSTMENT. | |
| 13. THIS CONTRACTOR SHALL PROVIDE ALL ITEMS OF MISCELLANEOUS STEEL AS REQUIRED FOR INSTALLATION OF ALL MECHANICAL ITEMS. | |
| 14. THIS CONTRACTOR SHALL DO ALL CONTROL WIRING. DIVISION 23 WILL DO ALL POWER WIRING. ALL WIRING SHALL BE IN ACCORDANCE WITH NATIONAL ELECTRIC CODE. CONTROL WIRING SHALL BE CONCEALED WITHIN WALL. | |
| 15. CORRECT SETTINGS ON ALL BALANCING FITTINGS SHALL BE PERMANENTLY MARKED. | |
| 16. THIS CONTRACTOR SHALL PATCH ALL WALLS AND FINISHES TO MATCH EXISTING WHERE ALL ITEMS OR EQUIPMENT ARE REMOVED. | |

LEGEND	
SYMBOL	DESCRIPTION
	CONDENSER WATER SUPPLY LINE
	CONDENSER WATER RETURN LINE
	EXISTING CONDENSER WATER PIPE
	SHUTOFF VALVE
	CHECK VALVE
	STRAINER WITH BLOWDOWN
	BUTTERFLY VALVE
	BALANCING VALVE
	UNION
	PIPE TURNS TO, AWAY
	THERMOMETER / PRESSURE GAGE
	THERMOMETER WELL CAPPED / GAGE COCK
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	CONNECTION POINT OF NEW TO EXISTING

CAMPUS PLANNING
 AND CONSTRUCTION
 COLUMBIA, SC 29208



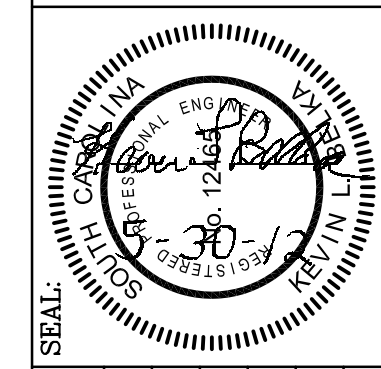
BUILDING:	DRAWING:	DATE:	REVISION:	CHECKED BY:	DATE:	ORIG. BY:	DATE:
	CP00331757	30MAY12		WCL			
				DEM			

PROJECT TITLE: EAST ENERGY CHILLER 1
 COOLING TOWER ADDITION
 STATE PROJECT NO.: H27-1969
 University of South Carolina



Swygert & Associates
 CONSULTING ENGINEERS
DBA Swygert & Assoc., Ltd. Telephone: (803) 791-9300
 Post Office Box 11686 Fax: (803) 791-0830
 Columbia, S.C. 29211 mail@swygert-associates.com

SHEET: M-3
 OF 3
 SHEET IN SET:

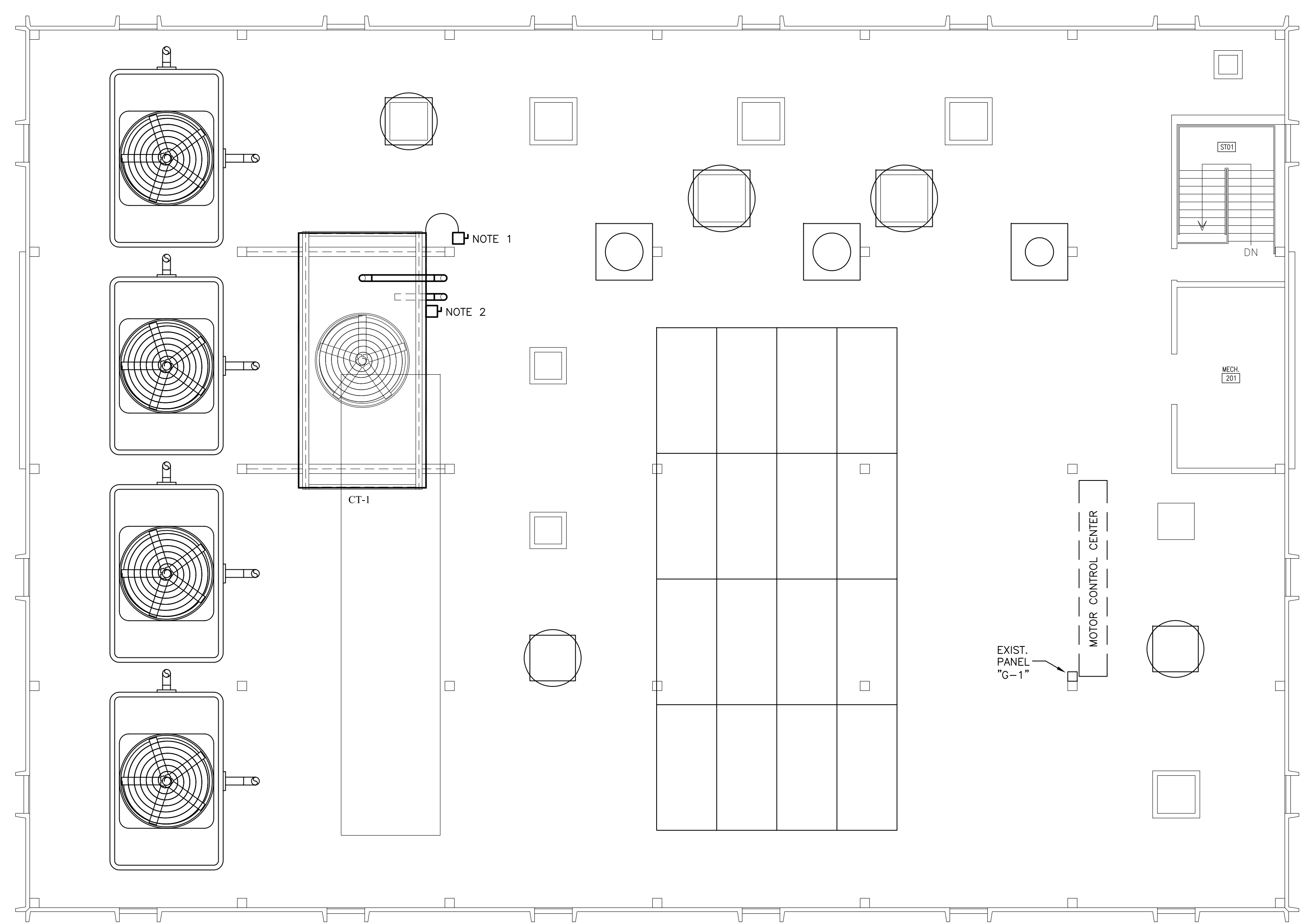


REV.	DESCRIPTION	DATE	ORIG.	BY

PROJECT TITLE: EAST ENERGY COOLING TOWER
NO. 2 CELL ADDITION

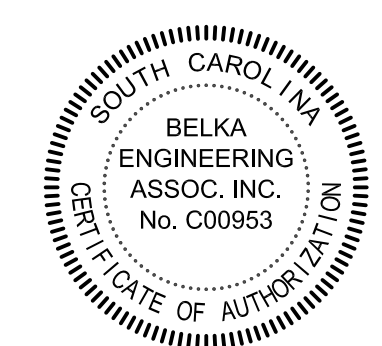
UNIVERSITY of South Carolina

SHEET: E1.0
OF
SHEET IN SET:
OF



- NOTES
1. FEED NEW COOLING TOWER WITH 3-#4, #8 GROUND IN 1-1/4" CONDUIT FROM EXISTING 480/277V MOTOR CONTROL CENTER. PROVIDE NEW 3-POLE, 100 AMP RATED 480V NEMA 3R FUSIBLE DISCONNECT SWITCH ADJACENT TO COOLING TOWER DRIVE. FIELD VERIFY LOCATION OF EXISTING MOTOR CONTROL CENTER ON MAIN FLOOR OF ENERGY COMPLEX. PROVIDE NEW BUCKET WITH 70 AMP 3 POLE 480V BREAKER OR MODIFY ONE OF THE EXISTING SPARE BREAKERS. MOTOR CONTROL CENTER IS OF # 00B2X0718M01. IN SECTION 5 THERE IS A SPARE 200 AMP THREE POLE BREAKER. IT HAS A TYPE SRP 200 AMP TRIP UNIT. AT CONTRACTOR'S OPTION, THAT TRIP COULD BE REPLACED WITH A 70 TRIP UNIT THAT WOULD PROVIDE AN ACCEPTABLE PLACE FOR FEEDERS TO THE NEW COOLING TOWER.
 2. PROVIDE A 30 AMP SINGLE PHASE FUSIBLE NEMA 3R 240V DISCONNECT. FIELD VERIFY THE LOCATION ON THE COOLING TOWER WITH THE MECHANICAL CONTRACTOR. PROVIDE A NEW 20 AMP TWO POLE BREAKER IN EXISTING PANEL G-1. PROVIDE 3-#10, #12 GROUND IN 3/4" CONDUIT. RACEWAYS INSIDE THE BUILDING MAY BE EMT. RACEWAYS ON THE ROOF SHALL BE IMC.

1 ROOF ELECTRICAL PLAN
SCALE: 1/8" = 1'-0"



BEA BELKA ENGINEERING ASSOCIATES, INC. US21113
7 CLUSTERS CT, SUITE 201
COLUMBIA, SOUTH CAROLINA 29210
(803) 731-0650 fax (803) 731-2880
EMAIL: kbelka@bellsouth.net