

ADDENDUM ONE to  
**COOLING TOWER REPLACEMENT**

Bid# 11-03

1. Replace Sheets M-1 and M-2 with revised Sheets M-1 and M-2.
2. Add Sheets E-1 and S-1.

END OF ADDENDUM ONE

**COOLING TOWER SCHEDULE**

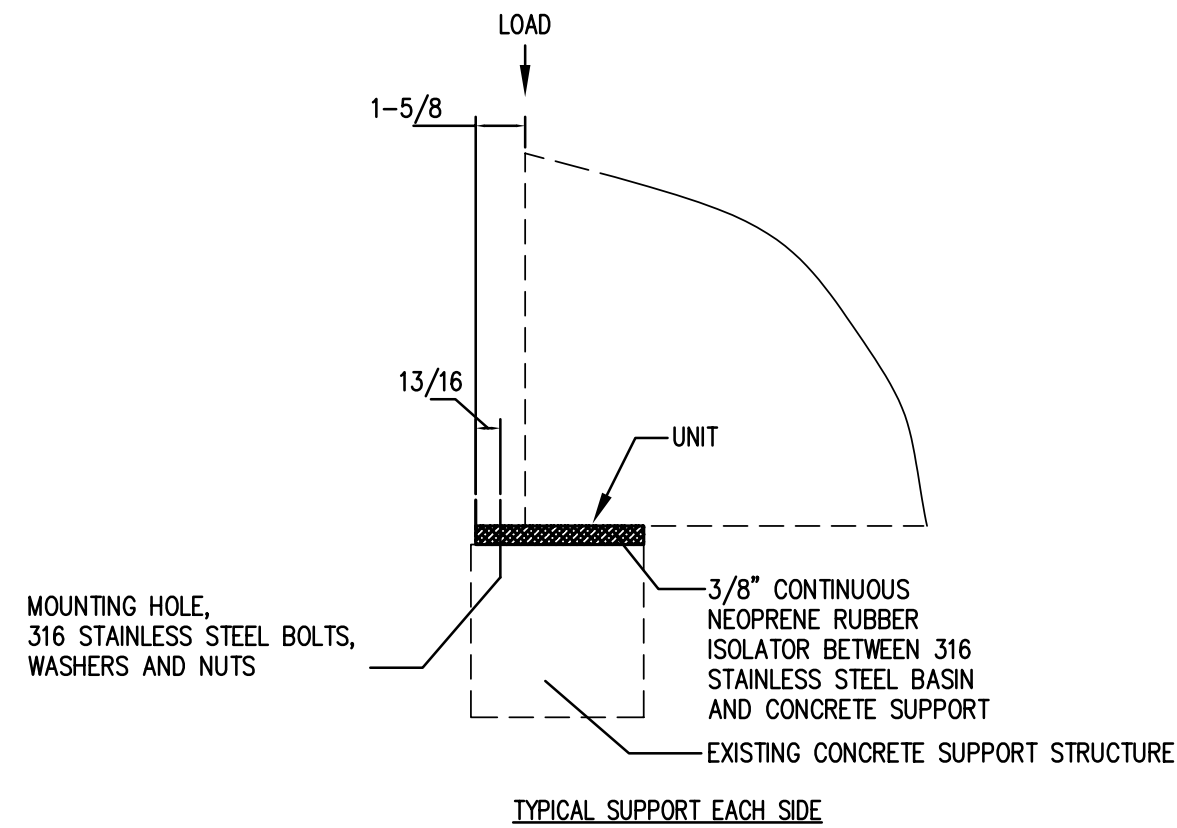
UNIT DESIGNATION		CT-1	CT-2
MANUFACTURER		EVAPCO	EVAPCO
MODEL	NO.	USS-114-1324	USS-114-1324
TYPE		INDUCED DRAFT COUNTERFLOW	INDUCED DRAFT COUNTERFLOW
CAPACITY	TONS	1,069	1,069
WATER FLOW RATE	GPM	3,000	3,000
ENTERING WATER TEMPERATURE	F DB	95.5	95.5
LEAVING WATER TEMPERATURE	F DB	85.5	85.5
DESIGN WET BULB	F WB	80	80
FAN	QUANTITY	1	1
TYPE		AXIAL PROPELLER	AXIAL PROPELLER
CONSTRUCTION		ALUMINUM ALLOY	ALUMINUM ALLOY
AIRFLOW	CFM (EACH)	255,100	255,100
FAN MOTOR	HP	100	100
TYPE		TEAO	TEAO
MOTOR EFFICIENCY	% EFFICIENCY	94 / PREMIUM	94 / PREMIUM
FAN MOTOR SPEED CONTROL	TYPE	VFD	VFD
FAN MOTOR ELECTRICAL SERVICE	V / PHASE / HZ	460 / 3 / 60	460 / 3 / 60
DRIVE	TYPE	GEAR	GEAR
FILL MATERIAL			
FILL	TYPE	POLY VINYL CHLORIDE	POLY VINYL CHLORIDE
FLAME SPREAD RATING	ASTM / E-84-81α	5	5
ELIMINATORS AND INLET LOUVERS	TYPE	POLY VINYL CHLORIDE	POLY VINYL CHLORIDE
PHYSICAL DATA			
DIMENSIONS	L x W x H	23'-9" x 13'-11.25" x 19'-7.63"	23'-9" x 13'-11.25" x 19'-7.63"
HEAVIEST SECTION	LBS.	14,100	14,100
WET OPERATING WEIGHT	LBS.	35,790	35,790
WIND VELOCITY LOADING	IBC		
WIND SPEED	3-SEC GUST - MPH	170.0	170.0
STRUCTURE CLASSIFICATION		IV	IV
EXPOSURE CATEGORY		D	D
STRUCTURE ELEVATION	FT	15	15
IMPORTANCE FACTOR		1	1
VELOCITY PRESSURE	PSI	74.5	74.5
SOUND PRESSURE AT 5 FEET FROM			
END	dB(A)	86	86
MOTOR SIDE	dB(A)	86	86
END	dB(A)	86	86
OPP MOTOR SIDE	dB(A)	86	86
TOP	dB(A)	89	89
NOTES		1-15	1-15

**VARIABLE FREQUENCY DRIVE SCHEDULE**

MARK	MANUFACTURER	MODEL	H.P.	MAX DRIVE OUTPUT CURRENT	VOLTS/PH/HZ	MANUAL BY-PASS	FUSED DISCONNECT	DIMENSIONS WxDxH	WEIGHT (LBS)	NOTES
CT-1	DANFOSS	VL-T-HVAC	100	130.0	460/3/60	YES	YES	29.2 x 16.2 x 33.5	143	1-7
CT-2	DANFOSS	VL-T-HVAC	100	130.0	460/3/60	YES	YES	29.2 x 16.2 x 33.5	143	1-7

**NOTES:**

1. PROVIDE DAN FOSS/GRAHAM VL-T-HVAC SIDE-BY-SIDE CABINET CONSTANT SPEED MANUAL CONTACTOR BYPASS WITH DRIVE/OFF/LINE/TEST SWITCH WITH FUSED DISCONNECT AND NEMA 3R STAINLESS STEEL ENCLOSURE
2. PROVIDE INTEGRATED TWO SETPOINT PID CONTROLLER, AUTOMATIC ENERGY OPTIMIZATION, AUTOMATIC MOTOR ADAPTATION, AUTOMATIC SWITCHING FREQUENCY, PROVIDE LOW FREQUENCY CUTOFF, MODULATION, DIGITAL VOLTAGE VECTOR CONTROL, AND A RUN PERMISSION CONTACT
3. PROVIDE DRIVE IMPEDANCE FUSING AND BYPASS FUSING
4. PROVIDE UNDERVOLTAGE PROTECTION FOR BYPASS OPERATION
5. PROVIDE START-UP SERVICE BY MANUFACTURERS REPRESENTATIVE
6. PROVIDE 5 YEAR PARTS AND LABOR WARRANTY
7. PROVIDE N2 BUS COMMUNICATION CARD



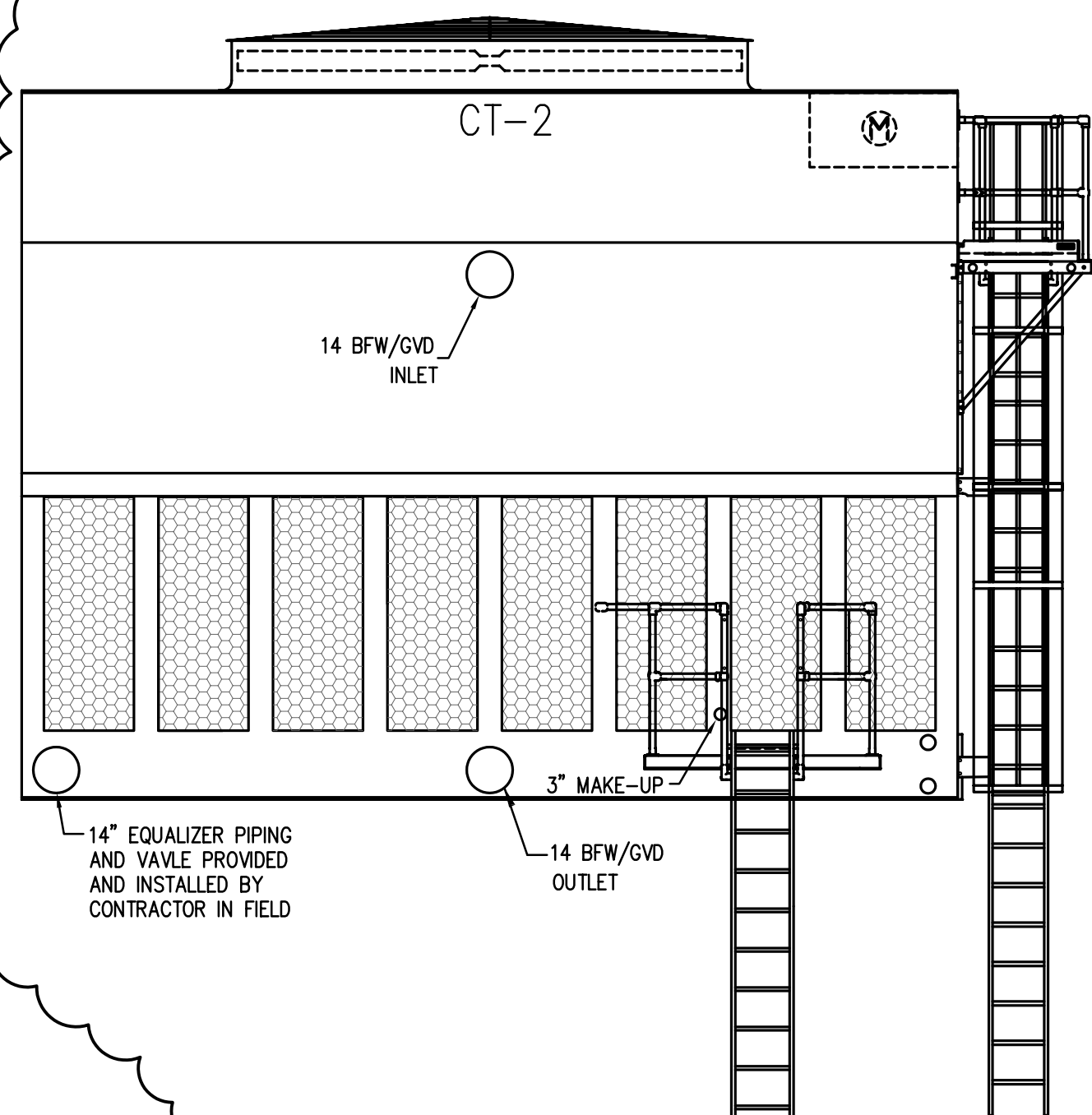
**TYPICAL SUPPORT DETAIL**

SYMBOL	DESCRIPTION
	NEW PIPING, OR EQUIPMENT
	EXISTING PIPING, OR EQUIPMENT TO REMAIN
	EXISTING PIPING, OR EQUIPMENT TO BE REMOVED
	PIPING, OR EQUIPMENT TO BE REPLACED
	CONNECTION BETWEEN NEW AND EXISTING WORK
	MECHANICAL NOTE - NUMBER
	DEMOLITION NOTE-NUMBER
	MANUAL BUTTERFLY VALVE
	THERMOMETER
	FLEX PIPE CONNECTION
	CIRCULATING PUMP
	BALANCING VALVE
	PRESSURE OR VACUUM GAUGE WITH VALVE
	BALL VALVE
	MOTORIZED BUTTERFLY VALVE, 120 VOLT
	BACKFLOW PREVENTER (BFP)

**MECHANICAL GENERAL NOTES:**

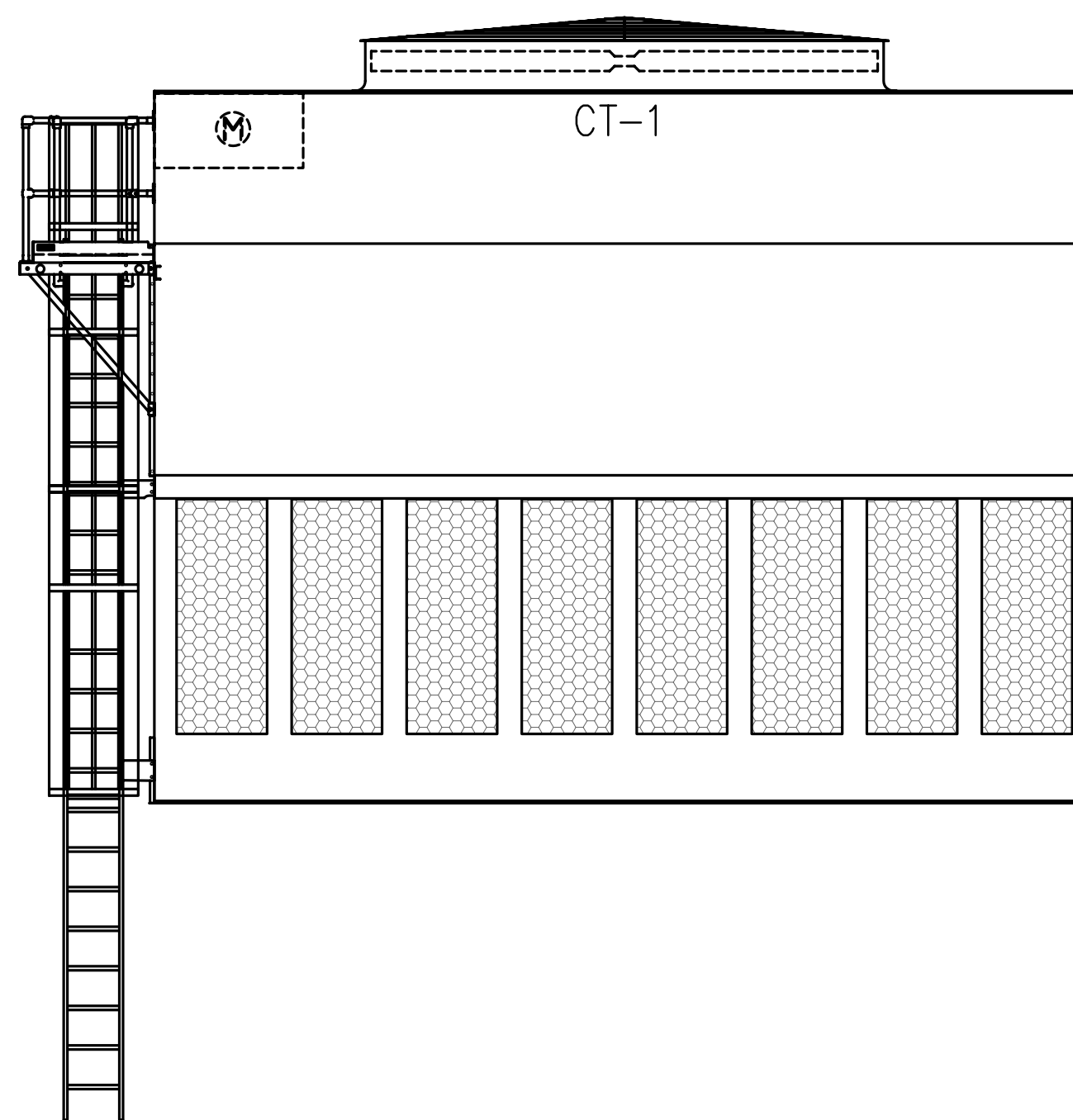
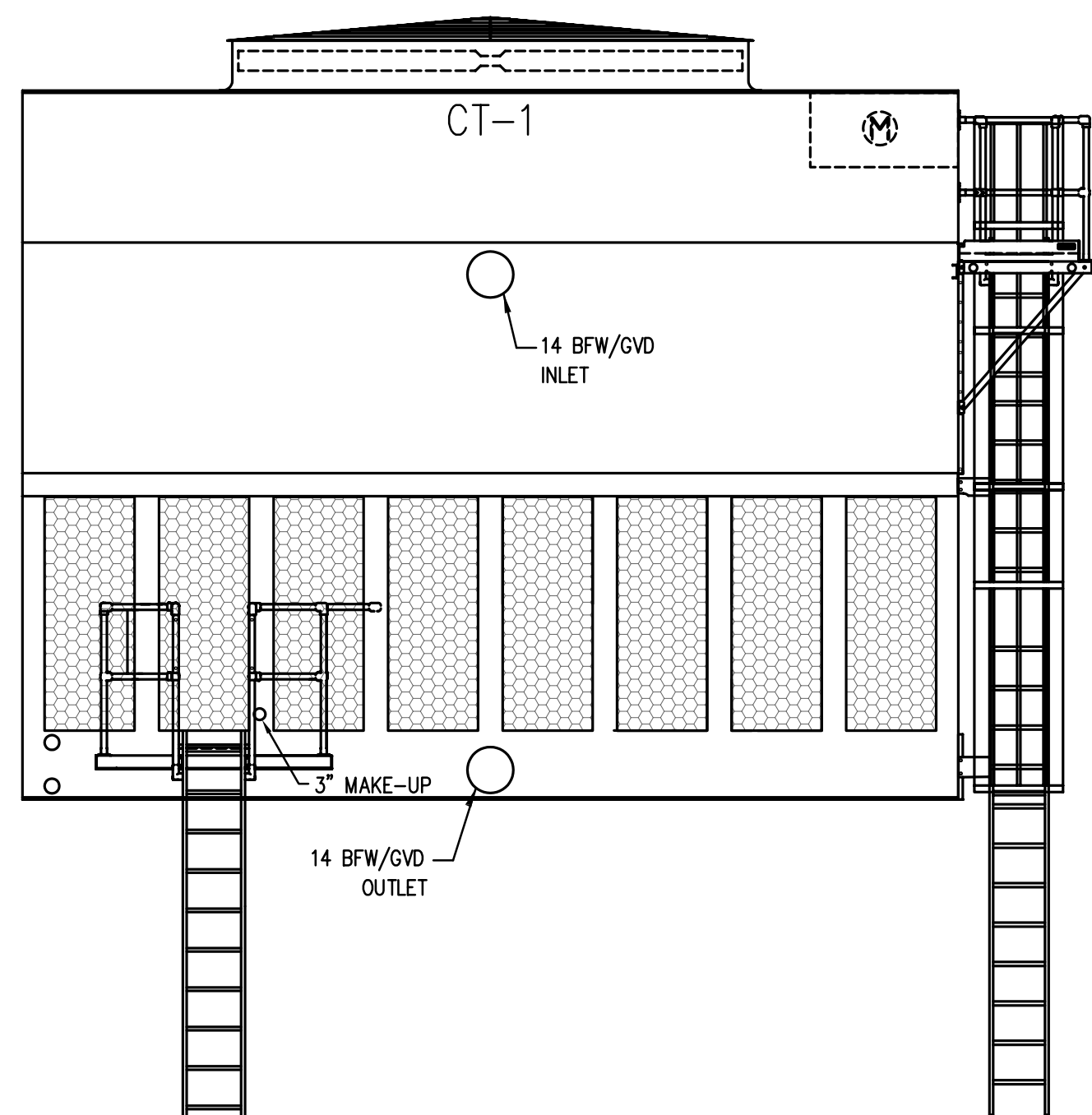
1. IN GENERAL, PLANS AND DIAGRAMS ARE SCHEMATIC ONLY AND SHOULD NOT BE SCALED. ALL BIDDERS SHALL PROVIDE A COMPLETE AND OPERATIONAL SYSTEM AS SUMMARIZED ON THE DRAWINGS. DRAWINGS ARE DIAGRAMMATIC AND MAY NOT SHOW ALL NECESSARY ITEMS IN DETAIL.
2. INTENT OF THESE NOTES AND MECHANICAL NOTES ON DRAWINGS IS TO CLARIFY THE SCOPE OF WORK AND ALERT CONTRACTOR OF EXISTING CONDITIONS. CONTRACTOR TO VISIT SITE AND VERIFY ALL CLEARANCES AND PROVIDE ADDITIONAL OFFSET AND/OR CHANGES IN PIPE TO MEET FIELD CONDITIONS AND COORDINATE WITH ELECTRICAL, STRUCTURAL AND SITE CONDITIONS BEFORE ANY CONSTRUCTION.
3. BIDDERS SHALL VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH ALL CONDITIONS INVOLVING THE WORK.
4. SHOULD ANY CONFLICTS ARISE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE CONFLICT BEFORE ANY CHANGES ARE MADE. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL BEFORE PROCEEDING WITH ANY CHANGES.
5. ALL WORK COVERED IN THIS SECTION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST PUBLISHED STANDARDS OF ASHRAE, AND NFPA.
6. ALL MECHANICAL WORK SHALL MEET ALL THE REQUIREMENTS OF THE FLORIDA BUILDING CODE 2007 WITH THE 2009 SUPPLEMENT.
7. THE MECHANICAL CONTRACTOR SHALL CHECK ALL EQUIPMENT FOR CORRECT VOLTAGE RATING BEFORE INSTALLATION.
8. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL MINOR ITEMS WHICH ARE OBVIOUSLY AND REASONABLY NECESSARY TO COMPLETE THE INSTALLATION WHETHER OR NOT SPECIFIED AS SHOWN ON THE PLANS.
9. THE MECHANICAL CONTRACTOR SHALL THOROUGHLY CLEAN ALL AIR CONDITIONING EQUIPMENT PRIOR TO SUBSTANTIAL COMPLETION.
10. MECHANICAL CONTRACTOR SHALL ARRANGE TO PAY FOR ALL NECESSARY PERMITS, LICENSES AND INSPECTIONS AS REQUIRED BY THE CITY.
11. ALL NEW MECHANICAL EQUIPMENT, MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE, UNLESS OTHERWISE STATED IN THE DOCUMENTS.
12. MAINTAIN AS-BUILT DRAWINGS, DAILY. SUBMIT TO ENGINEER/OWNER IN AUTOCAD FORMAT AFTER COMPLETION OF ALL WORK.
13. PROVIDE REBALANCE OF CONDENSER WATER FLOW AFTER CONSTRUCTION. PROVIDE AMP READINGS ON COOLING TOWER FANS.
14. ALL NEW CONDENSER WATER PIPING SHALL BE SCHEDULE 40 STEEL PIPE MANUFACTURED IN THE UNITED STATES AND COMPLY WITH ASTM A53. ALL JOINTS SHALL BE WELDED OR VICTALIC FITTINGS. PROVIDE NEOPRENE GASKETS OR CARBON STEEL FITTING OR DIALECTIC FITTING WHERE DISSIMILAR METALS MEET. PROVIDE STAINLESS STEEL FLANGES ON COOLING TOWERS.
15. COORDINATE WITH TECO BEFORE CONSTRUCTION.
16. ALL EXISTING EXPOSED CONDENSER WATER PIPING AND STEEL SUPPORTS SHALL BE CLEANED, PRIMED AND PAINTED WITH AN EPOXY COATING. MATCH EXISTING COLOR.
17. ALL PIPING SYSTEMS SHALL BE FLUSHED AND CLEANED BEFORE CONNECTING TO EXISTING PUMPS AND CHILLERS. PROVIDE NEW STARTUP STRAINERS ON CONDENSER WATER SYSTEM DURING CONSTRUCTION. REMOVE STRAINERS WHEN SYSTEM IS CLEAN.
18. REBALANCE CONDENSER WATER FLOW THROUGH CHILLERS AFTER CONSTRUCTION.
19. NEW WATER MAKE-UP PIPING AND OVERFLOW PIPING SHALL BE SCHEDULE 40 PVC.
20. ALL BUTTERFLY VALVES SHALL HAVE ALUMINUM BRONZE DISCS.
21. ALL HVAC AND CHILLER SHUTDOWNS SHALL BE COORDINATED WITH THE TAMPA SPORTS AUTHORITY PRIOR TO SHUTDOWN. ALL SHUTDOWNS SHALL OCCUR AFTER 6:00PM AND BEFORE 6:00 AM ON WEEKDAYS OR ON THE WEEKENDS.
22. TURN OVER USED VFD'S AND VALVES TO TAMPA SPORTS AUTHORITY.
23. ALL PIPING SUPPORTS INCLUDING BRACKETS, BOLTS, NUTS, SCREWS, UNISTRUT, AND HANGERS ON THE COOLING TOWERS SHALL BE STAINLESS STEEL. REPLACE EXISTING GALVANIZED SUPPORTS ON COOLING TOWER STRUCTURE WITH STAINLESS STEEL.

- NOTES:**
1. BASIS OF DESIGN EVAPCO MODEL: USS-114-1224
  2. PROVIDE 316 STAINLESS STEEL WELDED CONSTRUCTION OF BASIN, AND 316 STAINLESS STEEL CONSTRUCTION OF FAN AND FILL CASING AND STRUCTURAL COMPONENTS
  3. PROVIDE CTI CERTIFICATION OF THERMAL PERFORMANCE
  4. PROVIDE TEAO PREMIUM EFFICIENT INVERTER DUTY FAN MOTORS AND GEAR DRIVE WITH LOW FREQUENCY/RPM SHUTOFF.
  5. PROVIDE DRIVE SIDE EXTERNAL SERVICE MOTOR GEAR BOX ACCESS WORKING PLATFORM AND BASIN LEVEL ACCESS WORKING PLATFORM EACH WITH HANDRAILS, VERTICAL LADDER, SAFETY CAGE (FOR MOTOR ACCESS LADDER) AND FOOT LADDER EXTENSION TO GRADE FOR EACH COOLING TOWER (TO BE INSTALLED BY MECHANICAL CONTRACTOR)
  6. 14" DIAMETER BFW/GVD EQUALIZER CONNECTION (CONTRACTOR TO PROVIDE EXTERNAL EQUALIZER PIPING WITH MANUAL ISOLATION VALVES BETWEEN COOLING TOWER CELLS CT-1 AND CT-2)
  7. NOT USED.
  8. ONE (1) 460/3 POWER CONNECTION REQUIRED FOR EACH TOWER (CELL)
  9. FAN MOTOR SERVICE DISCONNECT BY ELECTRICAL CONTRACTOR TO PROVIDE INTERLOCK WIRING BETWEEN SERVICE DISCONNECT AUXILIARY CONTACTS AND VFD INTERLOCK CONTACTS SERVING EACH COOLING TOWER FAN MOTOR
  10. COOLING TOWER SELECTED, DESIGNED AND MANUFACTURED TO MEET IBC STANDARDS AND WIND VELOCITY PRESSURE (PSF) UP TO 145 PSF OR 170 MPH
  11. EACH COOLING TOWER TO BE SHIPPED IN TWO (2) SECTIONS FOR FIELD GASKET TING INSTALLATION, SEALING AND BOLTING BY CONTRACTOR. (NEOPRENE ISOLATING MATERIAL BETWEEN COOLING TOWER SUPPORT STRUCTURE AND 316 STAINLESS STEEL BASIN TO BE PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR)
  12. PROVIDE BRASS FLOAT VALVE WITH ADJUSTABLE FLOAT, LOUVER ACCESS DOOR, OIL LEVEL SITE GLASS, OIL LEVEL SWITCH, EXTENDED OIL FILL DRAIN LINE AND
  13. PROVIDE VIBRATION DETECTION SWITCH FOR FIELD INSTALLATION, WIRING AND CALIBRATION BY MECHANICAL CONTRACTOR. INTERLOCK WITH VFD CUTOFF CIRCUIT AND JOHNSON CONTROLS ENERGY MANAGEMENT SYSTEM.
  14. PROVIDE MANUFACTURERS FIVE (5) YEAR PARTS ONLY WARRANTY FOR THE TOTAL COOLING TOWER
  15. PROVIDE STARTUP AND COMMISSIONING SERVICE BY MANUFACTURERS REPRESENTATIVE



**TOWER ELEVATION PIPING SIDE**

SCALE: 1/4"=1'-0"



**TOWER ELEVATION MOTOR SIDE**

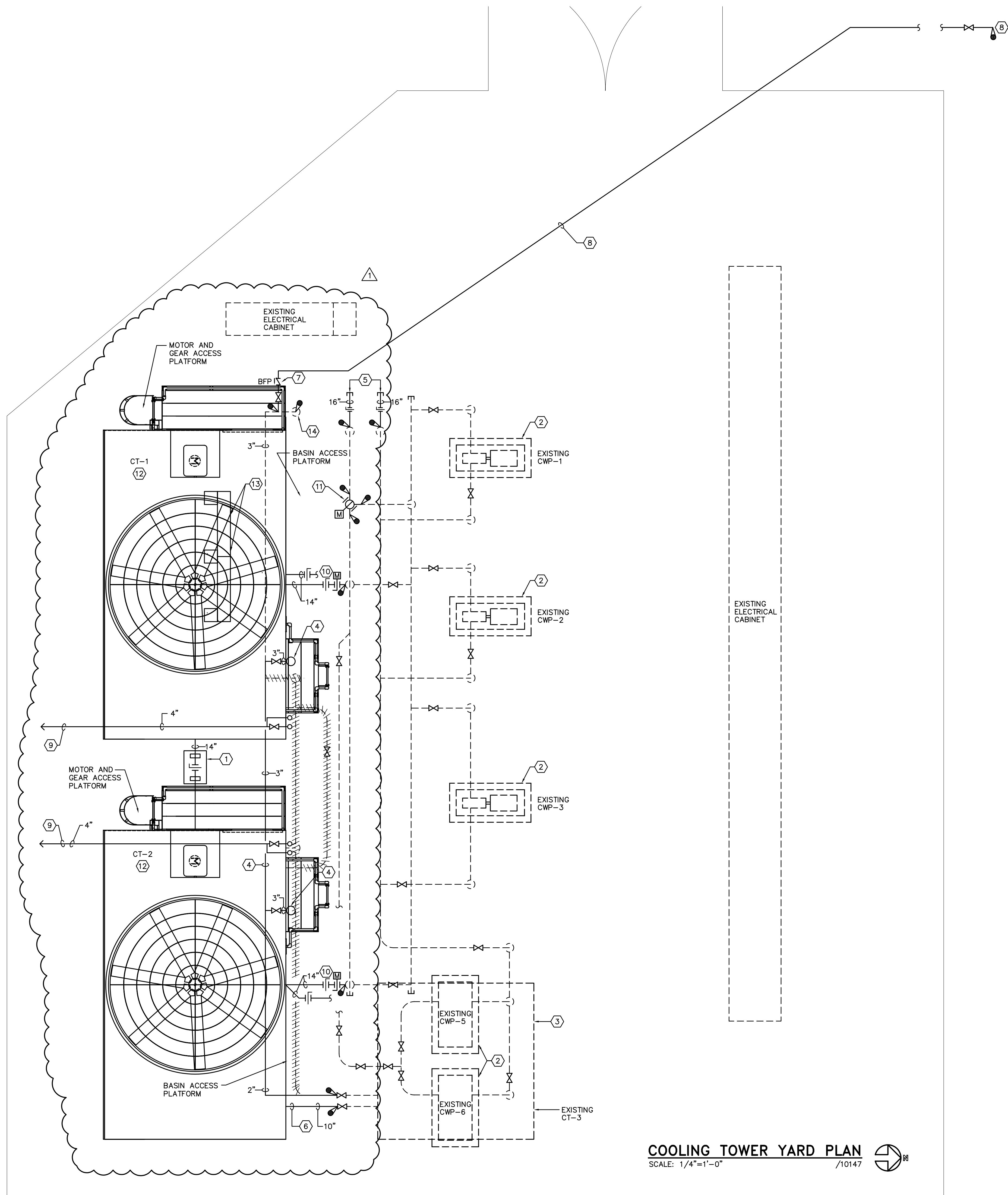
SCALE: 1/4"=1'-0"

REVISIONS	DATE:	12/03/10
DESCRIPTION:		
ADDENDUM #:		

**DIAMONDBACK ENGINEERING, Inc.**  
 1801 North Hines Avenue  
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**RAYMOND JAMES STADIUM**  
 COOLING TOWER REPLACEMENT  
 TAMPA, FLORIDA 33607

SHEET TITLE:	MECHANICAL LEGEND, NOTES, SCHEDULES AND ELEVATIONS
DRAWN BY:	MB
CHECKED BY:	RHT
DATE:	11/18/10
PROJECT NUMBER:	10147
SHEET NUMBER:	M-1



**KEYED NOTES:**

- ① NEW 14" EQUALIZER LINE WITH BUTTERFLY VALVE. PROVIDE PIPE STAND TO SUPPORT VALVE AND PIPING.
- ② EXISTING PUMPS AND ASSOCIATED PIPING TO REMAIN.
- ③ EXISTING CT-3 TO REMAIN.
- ④ NEW 3" TOWER FILL LINE.
- ⑤ PROVIDE NEW 16" TAP TO EXISTING CONDENSER WATER PIPING. PROVIDE 16" BUTTERFLY VALVE AND CAP FOR FUTURE CONNECTION.
- ⑥ NEW EQUALIZER LINE. MATCH EXISTING SIZE.
- ⑦ NEW 3" WATER MAKEUP LINE FROM EXISTING WELL PUMP. PROVIDE SHUTOFF VALVE AND BACK FLOW PREVENTER.
- ⑧ NEW 3" WATER MAKEUP PIPING. PROVIDE 3' DEEP TRENCH WITH IDENTIFICATION TAPE OVER PIPING. PROVIDE VALVE AT CONNECTION TO PUMP DISCHARGE PIPING. FIELD VERIFY UTILITIES BEFORE TRENCHING. NOTIFY TECO BEFORE DIGGING. COORDINATE LOCATION OF WALL AT SITE. PROVIDE TRENCH AND BACK FILL. AREA SHALL BE BROUGHT BACK TO EXISTING STATE.
- ⑨ NEW 4" OVERFLOW AND DRAIN PIPING.
- ⑩ PROVIDE NEW PIPE AND CONNECTIONS TO COOLING TOWER. PROVIDE NEW BUTTERFLY VALVE AND MOTORIZED VALVES AT TOWERS. MOTORIZED VALVES TO BE 120 VOLT. PROVIDE STAINLESS STEEL TO CARBON FLANGES WITH GASKET AT COOLING TOWERS.
- ⑪ PROVIDE NEW 3 WAY BYPASS VALVE. VALVE TO BE 120 VOLT. CONNECT EXISTING CONTROLS.
- ⑫ NEW COOLING TOWER. SEE SCHEDULE.
- ⑬ REMOVE EXISTING VFD'S AND PROVIDE NEW 100HP VFD'S. PROVIDE ADDITIONAL CONCRETE SUPPORT PIERS AS NECESSARY. VFD'S ARE LOCATED UNDER TOWER.
- ⑭ REPLACE SECTION OF DAMAGED PIPE.

**COOLING TOWER YARD PLAN**  
 SCALE: 1/4"=1'-0" /10147

REVISIONS	DATE:
DESCRIPTION:	12/03/10
ADDENDUM #:	

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SHEET TITLE:	MECHANICAL PLAN
DRAWN BY:	MB
CHECKED BY:	RHT
DATE:	11/18/10
PROJECT NUMBER:	10147
SHEET NUMBER:	

**M-2**

**MCC-CT LOAD SUMMARY**

REMOVED 75 HP CT-1	-79,776 VA
REMOVED 75 HP CT-2	-79,776 VA
NEW 100 HP CT-1	103,044 VA
NEW 100 HP CT-2	103,044 VA
EXISTING 25 HP CT-3	29,085 VA
EXISTING 100 HP CWP-1	103,044 VA
EXISTING 100 HP CWP-2	103,044 VA
* EXISTING 100 HP CWP-3	-
EXISTING 40 HP CWP-5	43,212 VA
** EXISTING 40 HP CWP-6	-
NEW TOTAL =	484,473 VA (583 AMPS)

\* PUMP CWP-3 WILL ONLY OPERATE IF PUMP CWP1 OR PUMP CWP-2 IS NOT OPERATING.  
 \*\* PUMP CWP-6 WILL ONLY OPERATE WHEN PUMP CWP-5 IS NOT OPERATING.

LIGHTNING PROTECTION LEGEND	
SYMBOL	DESCRIPTION
---	NEW COPPER ROOF CONDUCTOR AND ADHESIVE HOLD DOWN STRAPS.
	EXISTING COPPER DOWNLEAD AND GROUND ROD.
⊙	NEW AIR TERMINAL AND ADHESIVE POINT BASE.

**LIGHTNING PROTECTION NOTES:**

- REUSE EXISTING UNDERGROUND CONDUCTORS AND GROUND RODS AND COPPER DOWNLEADS ON EXISTING CONCRETE SUPPORT STRUCTURE. IF NEW CONCRETE STRUCTURAL FOOTERS INTERFERE WITH EXISTING UNDERGROUND LIGHTNING PROTECTION CONDUCTORS AND GROUND RODS, INSTALL NEW COPPER CONDUCTORS AND NEW 30 FOOT GROUND RODS IN TWO OPPOSITE LOCATIONS.
- INSTALL NEW COPPER CONDUCTORS ON NEW COOLING TOWER STRUCTURE AND NEW DOWNLEAD CONDUCTORS AND CONNECT TO EXISTING DOWNLEAD CONDUCTORS ON CONCRETE STRUCTURE.
- INSTALL NEW 18" COPPER AIR TERMINALS AS SHOWN.
- RECONNECT EXISTING BONDING JUMPER CONDUCTORS TO NEW VFD CABINETS.
- BOND TO ALL METAL OBJECTS WITHIN 6'-0" OF LIGHTNING PROTECTION CONDUCTORS PER CODE.
- BOND TO ALL METAL OBJECTS WHICH PROJECT ABOVE COOLING TOWER TO LIGHTNING PROTECTION SYSTEM.
- ALL WORK TO BE PER NFPA 780.
- PROVIDE NEW UL MASTER LABEL FOR COMPLETED INSTALLATION.

**KEYED NOTES:**

- EXISTING 2 PARALLEL RUNS OF 4-500MCM COPPER TO REMAIN (760 AMPS) FED FROM 800 AMP SQUARE D CIRCUIT BREAKER IN EXISTING SWITCHBOARD "MSB5". CIRCUIT BREAKER HAS A 75% RATING PLUG FOR 600AMPS. REPLACE RATING PLUG WITH 100% RATING PLUG FOR 800AMPS.
- NEW 100HP VFD WITH INTEGRAL DISCONNECT SWITCH TO REPLACE EXISTING 75HP VFD. REMOVE EXISTING FEEDER BACK TO MCC-CT AND FURNISH AND INSTALL NEW 3 NO. 2/0 COPPER AND 1 NO. 6 COPPER E.G. FROM NEW MCC CIRCUIT BREAKER TO VFD AND FROM VFD TO COOLING TOWER MOTOR. DUE TO INSTALLATION OF NEW CONCRETE STRUCTURAL FOOTER, INSTALL NEW 1 1/2" UNDERGROUND CONDUIT FROM MCC TO VFD FOR NEW CONDUITS. INSTALL NEW SCHEDULE 40 PVC CONDUIT FROM NEW VFD TO MOTOR. USE SCHEDULE 80 PVC WHERE EXPOSED TO DIRECT SUNLIGHT.
- REPLACE EXISTING 125AMP CIRCUIT BREAKER WITH NEW 200AMP-3POLE CIRCUIT BREAKER, SQUARE "D", TYPE J FRAME, CAT. NUMBER JJP36200 (65KAIC). PROVIDE MOUNTING HARDWARE AS REQUIRED. FIELD VERIFY CAT. NUMBER IN FIELD PRIOR TO ORDERING.
- EXISTING GFI MAINTENANCE RECEPTACLE WITH WEATHERPROOF COVER. REPLACE COVER WITH NEW POLYCARBONATE "CORD-IN-USE" COVER. REROUTE EXISTING UNDERGROUND BRANCH CIRCUIT AND CONDUIT DUE TO INSTALLATION OF NEW CONCRETE STRUCTURAL FOOTER.
- FURNISH AND INSTALL NEW FARADAY TYPE LIGHTNING PROTECTION SYSTEM TO COMPLY WITH NFPA 780. SEE LIGHTNING PROTECTION NOTES.
- ALL EXISTING METAL HALIDE LIGHTING FIXTURES LOCATED ON CONCRETE SUPPORT STRUCTURE OF CT-1 AND CT-2 TO BE REMOVED. FURNISH AND INSTALL NEW LED TYPE LIGHTS AS INDICATED. LOCATE FIXTURES SO THAT THEY ARE NOT DIRECTLY UNDERNEATH ANY WATER PIPING. REUSE EXISTING 120VOLT TIMECLOCK-CONTROLLED CIRCUIT BUT INSTALL NEW WIRING AND PVC CONDUIT. REROUTE EXISTING UNDERGROUND BRANCH CIRCUIT AND CONDUIT DUE TO INSTALLATION OF NEW CONCRETE STRUCTURAL FOOTER. SUBMIT LIGHTING FIXTURE CUT SHEETS TO ENGINEER FOR APPROVAL BEFORE ORDERING.  
 MANUFACTURER: LUMARK  
 CAT. NO.: LD-WP-GL-4A-120V-GM.
- NEW POLE-MOUNTED LED AREA LIGHTING FIXTURE AND MOUNT ON POLE ATTACHED TO PLATFORM STRUCTURE. BOND POLE TO LIGHTING PROTECTION SYSTEM. FIELD VERIFY EXACT MOUNTING HEIGHT. REUSE EXISTING 120VOLT TIMECLOCK-CONTROLLED CIRCUIT BUT INSTALL NEW WIRING AND PVC CONDUIT. REROUTE EXISTING UNDERGROUND BRANCH CIRCUIT AND CONDUIT DUE TO INSTALLATION OF NEW CONCRETE STRUCTURAL FOOTER. SUBMIT LIGHTING FIXTURE CUT SHEETS TO ENGINEER FOR APPROVAL BEFORE ORDERING.  
 MANUFACTURER: MCGRAW EDISON  
 CAT. NO.: VTS-A04-LED-E1-SWQ-GM.
- INSTALL NEW TOGGLE SWITCH WITH WEATHER-PROOF COVER FOR EACH POLE LIGHT TO TURN POLE LIGHT ON OR OFF AT NIGHT.

**GENERAL NOTES:**

- ALL WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND SHALL ALSO COMPLY WITH ALL APPLICABLE RULES AND REGULATIONS OF LOCAL AND STATE LAWS AND ORDINANCES.
- CONTRACTOR SHALL MAKE A THOROUGH EXAMINATION OF THE SITE AND THE CONTRACT DOCUMENTS. NO CLAIM FOR EXTRA COMPENSATION WILL BE RECOGNIZED IF DIFFICULTIES ARE ENCOUNTERED WHICH AN EXAMINATION OF SITE CONDITIONS AND CONTRACT DOCUMENTS PRIOR TO EXECUTING CONTRACT WOULD HAVE REVEALED.
- ELECTRICAL CONTRACTOR SHALL ARRANGE FOR ALL NECESSARY PERMITS, LICENSES, UTILITY COORDINATION, AND INSPECTIONS AS REQUIRED BY THE CITY OR UTILITY COMPANY. CONTRACTOR IS RESPONSIBLE FOR ALL EQUIPMENT REQUIRED BY UTILITY COMPANY AND SHOULD INCLUDE NECESSARY COSTS IN BID.
- CONTRACTOR SHALL LEGIBLY MARK-UP A SET OF 24"x36" DRAWINGS TO REFLECT AS-BUILT CONDITIONS, AND TURN OVER TO ARCHITECT.
- THE ELECTRICAL INSTALLATION SHALL COMPLY WITH THE 2008 EDITION OF THE NATIONAL ELECTRIC CODE.

**SWITCHGEAR:**

- INSTALL ENGRAVED PLASTIC-LAMINATE LABELS ON EACH MAJOR UNIT OF ELECTRICAL EQUIPMENT IDENTIFYING PANELBOARD NAME OR EQUIPMENT SERVING. EXAMPLES ARE, SWITCHBOARD CIRCUIT BREAKERS AND DISCONNECT SWITCHES, MOTOR STARTERS, I.E. LABELS SHALL BE 1/16" THICK BLACK PLASTIC LAMINATE WITH 3/8" WHITE CORE PLIE LETTERS.

**GROUNDING:**

- THE ELECTRICAL SYSTEMS SHALL BE COMPLETELY AND EFFECTIVELY GROUNDED AS REQUIRED BY NATIONAL ELECTRICAL CODE. ALL METALLIC RACEWAYS SHALL BE MECHANICALLY AND ELECTRICALLY SECURE AT ALL JOINTS AND AT ALL BOXES, CABINETS, FITTINGS AND EQUIPMENT.

**WIRE/RACEWAY:**

- ALL CONDUCTORS SHALL BE COPPER. CONDUCTOR INSULATION SHALL BE DUAL TYPE THHN/THWN 75°C (167°F) FOR DRY, DAMP, AND WET LOCATIONS. CONDUCTOR INSULATION WITH SINGLE TYPE MARKING THHN 90°C (194°F) MAY BE USED FOR DRY LOCATIONS ONLY. ALL CONDUCTORS SHALL BE COLOR CODED AS REQUIRED BY NEC AND FURTHER IDENTIFIED AND CODED AS SPECIFIED HEREINAFTER. COLOR CODING SHALL BE BY MEANS OF COLORED INSULATING MATERIAL, COLORED BRAID OR JACKET OVER THE INSULATION OR BY MEANS OF SUITABLE COLORED, PERMANENT, NON-AGING, INSULATING TAPE APPLIED TO CONDUCTORS AT EACH CABINET OR JUNCTION POINT. THE COLOR CODING SHALL BE ACCOMPLISHED AS THE CONDUCTORS ARE INSTALLED. THE FOLLOWING SYSTEMS OF COLOR CODING SHALL BE STRICTLY ADHERED TO:

A) GROUND LEADS: GREEN

C) 120/208 VOLT UNGROUNDED PHASE WIRES:  
 PHASE A: BROWN  
 PHASE B: RED  
 PHASE C: BLUE  
 NEUTRAL: WHITE

B) 277/480 VOLT UNGROUNDED PHASE WIRES:  
 PHASE A: BROWN  
 PHASE B: ORANGE  
 PHASE C: YELLOW  
 NEUTRAL: GRAY

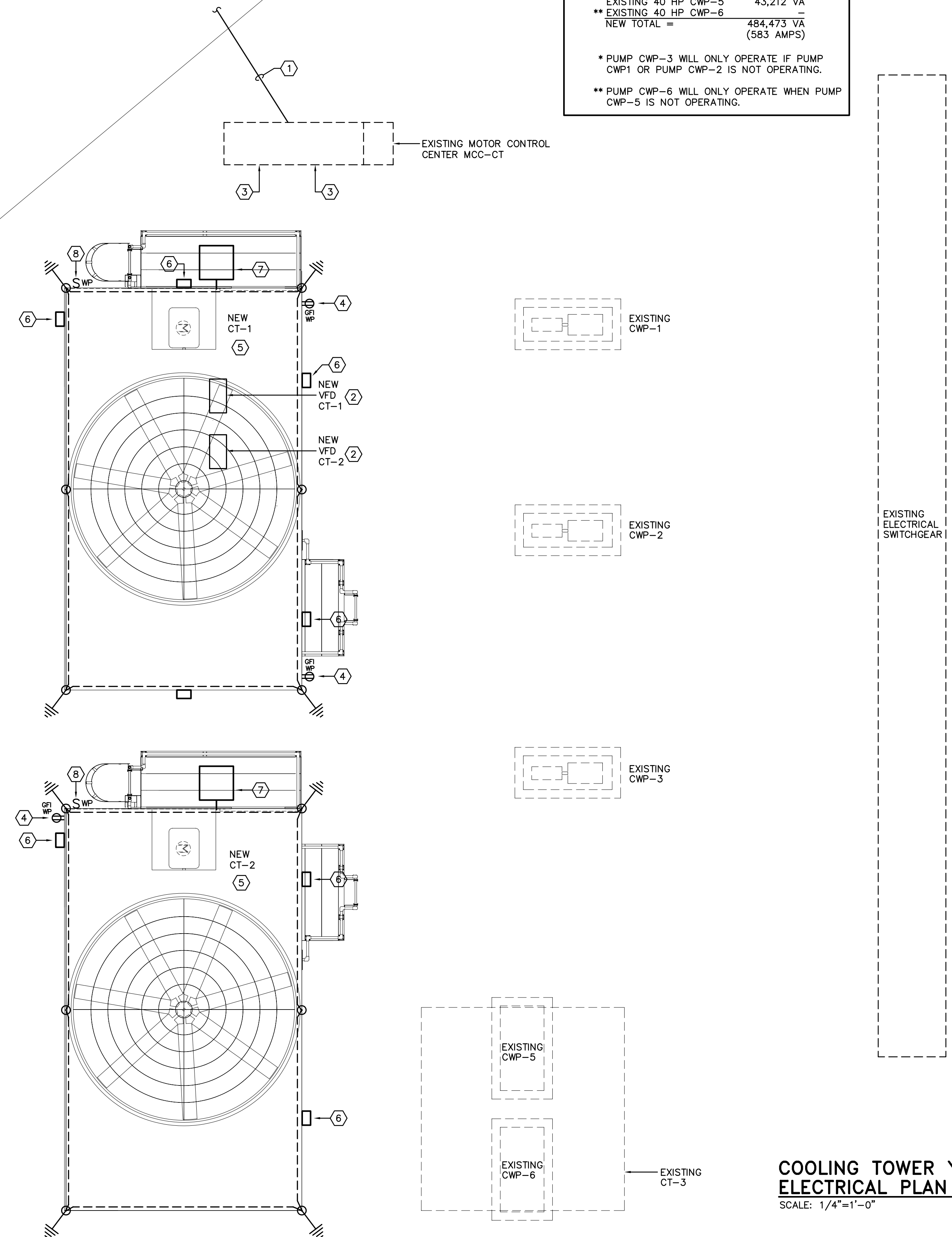
THE COLOR CODE ASSIGNED TO EACH PHASE WIRE SHALL BE CONSISTENTLY FOLLOWED THROUGHOUT. ALL COLOR CODING FOR CONDUCTOR IDENTIFICATION SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE ARTICLE 310.12 AND 250.119 2008 EDITION YEAR.

- UNLESS OTHERWISE NOTED ALL BRANCH CIRCUITRY ABOVE GRADE SHALL BE RUN IN SCHEDULE 40 PVC CONDUIT AND SCHEDULE 8P PVC WHERE EXPOSED TO DIRECT SUNLIGHT. CONNECTION TO VIBRATING EQUIPMENT SUCH AS MOTORS SHALL BE MADE WITH FLEXIBLE SEAL-TIGHT CONDUIT. TRANSITION FROM PVC TO FLEXIBLE SEAL-TIGHT WITHIN 6'-0" OF MOTOR CONNECTION.
- ALL RACEWAYS SHALL BE PROPERLY ALIGNED, GROUDED, AND SUPPORTED BY MECHANICAL TYPE "CADDY" CLIPS AT INTERVALS NOT EXCEEDING 8 FEET. EXISTING RACEWAYS TO REMAIN SHALL BE RESUPPORTED WHERE RACEWAY SUPPORTS EXCEED 8 FEET.
- ALL RACEWAYS SHALL BE PROVIDED WITH A PARITY SIZED GREEN EQUIPMENT GROUND CONDUCTOR. GROUND CONDUCTOR SHALL BE INSTALLED IN ENTIRE RACEWAY SYSTEM. GROUND CONDUCTORS SHALL BE CONNECTED TO GROUND BUS IN SWITCHBOARD.
- UNLESS OTHERWISE INDICATED, ALL BRANCH CIRCUIT CONDUCTORS SHALL BE NO. 12 AWG. MINIMUM. INCREASE CONDUCTOR SIZE BASED ON LENGTH OF RUN AS INDICATED BELOW:

ALL BRANCH CIRCUIT WIRING TO 120 VOLT LIGHTING FIXTURES AND RECEPTACLES SHALL BE AS FOLLOWS:  
 MAXIMUM OVERALL LENGTH 85FT. - 2 #12, 1 #12 E.G.  
 MAXIMUM OVERALL LENGTH 140FT. - 2 #10, 1 #10 E.G.  
 MAXIMUM OVERALL LENGTH 225FT. - 2 #8, 1 #8 E.G.  
 MAXIMUM OVERALL LENGTH 350FT. - 2 #6, 1 #6 E.G.

ALL BRANCH CIRCUIT WIRING TO 277 VOLT LIGHTING FIXTURES SHALL BE AS FOLLOWS:  
 MAXIMUM OVERALL LENGTH 200FT. - 2 #12, 1 #12 E.G.  
 MAXIMUM OVERALL LENGTH 325FT. - 2 #10, 1 #10 E.G.  
 MAXIMUM OVERALL LENGTH 500FT. - 2 #8, 1 #8 E.G.

- MINIMUM CONDUIT SIZE 3/4".
- REPLACE ALL EXISTING CORRODED CONDUIT SUPPORT CHANNEL AND STRAPS WITH NEW STAINLESS STEEL CHANNEL AND HARDWARE.
- ALL NEW HARDWARE TO BE STAINLESS STEEL.



**COOLING TOWER YARD ELECTRICAL PLAN**

SCALE: 1/4"=1'-0" /10147



REVISIONS	DATE:
DESCRIPTION:	12/03/10
ADDENDUM #:	

**DIAMONDBACK ENGINEERING, Inc.**  
 1800 North Himes Avenue  
 Tampa, Florida 33607  
 Tel: (813) 350-0800 • Fax: (813) 350-0083  
 REG. NO. EB9758

**RAYMOND JAMES STADIUM**  
 COOLING TOWER REPLACEMENT  
 TAMPA, FLORIDA 33607

SHEET TITLE:
ELECTRICAL PLAN
DRAWN BY:
MIW
CHECKED BY:
MIW
DATE:
11/18/10
PROJECT NUMBER:
10147
SHEET NUMBER:

**E-1**

# GENERAL NOTES

## CODES AND SPECIFICATIONS

- A. The Florida Building Code, 2007 Edition with 2009 Supplements.
- B. ASCE 7-05 Minimum Design Loads for Buildings and Other Structures.

## DESIGN LOADS

- A. Wind Loads
  - 1. Code - ASCE 7-05
  - 2. Wind Speed - 120 mph
  - 3. Building Category - II
  - 4. Exposure Category - C
  - 5. Importance Factor - 1.0
  - 6. Directionality Factor Kd - .85
  - 7. Wind Born Debris Reg. - No

Design Wind pressure for Cooling Tower = 74.5psf  
(Using a design wind speed of 160 mph as directed by owner)

## FOUNDATION / SLAB-ON-GRADE

- A. Foundation Type
  - 1. Spread / Strip Footings
    - a. All footings have been designed assuming an allowable bearing pressure of 2000 psf.
- B. Concrete placement shall occur immediately after footing excavation and placement of reinforcement. Any free standing water shall be pumped out of the excavation prior to concrete placement.

## CONCRETE AND REINFORCING STEEL

Location	28-day Comp. Strength (psi)	Max Size Aggregate	Slump Range	Max. W/C Ratio
Footings	3000 NW	1"	3" to 5"	0.55

NW = Normal Weight Concrete (145 pcf)

- A. All reinforcing steel to be new billet steel, conforming to ASTM A-615, Grade 60.
- B. Provide cover to all reinforcement steel meeting the requirements of ACI 318.

## STRUCTURAL STEEL

- A. All structural steel shall be stainless steel conforming to ASTM A316 with a minimum yield strength of 30 ksi
- B. All shop and field welding shall conform to AWS Structural Welding Code, ANSI/AWS D1.1 for stainless steel.
- C. Grout below base plates shall be non-shrink, non-metallic grout with a minimum compressive strength of 6000 psi.

## ADHESIVE AND MECHANICAL FASTENERS

- A. General
  - 1. All anchors for the project are to be stainless steel.
  - 2. All anchors are to be installed in strict accordance with the manufacturer's procedures and recommendations.
  - 3. All anchors are subject to testing at the engineer's discretion.
- B. Adhesive Anchors
  - 1. Pre-approved adhesive fasteners are as follows:
    - a. For standard installations in concrete and grouted masonry:
      - 1) Ramset / Red Head - Epcon A7
      - 2) Hilti - HIT HY150
    - b. For installations with oversized or cored drilled holes in concrete:
      - 1) Ramset / Red Head - Epcon C6
      - 2) Hilti - HIT RE 500
    - c. For installations in hollow masonry:
      - 1) Ramset / Red Head - Epcon A7 with screen tube
      - 2) Hilti - HIT HY 20 with screen tube
  - 2. Provide minimum embedment as follows:

Anchor Size	Embedment	Rebar #3	Embedment
3/8"	4"	#3	3"
1/2"	6"	#4	4"
5/8"	8"	#5	6"
3/4"	10"	#6	8"
7/8"	12"	#7	10"
1"	1"	#8	12"

- C. Mechanical Anchors (expansion anchors, wedge bolts)
  - 1. Pre-approved mechanical fasteners are as follows:
    - a. For standard installations in concrete and grouted masonry:
      - 1) Ramset / Red Head - Trubolt
      - 2) Hilti - Kwik Bolt III
    - 2. Provide minimum embedment as follows:

Anchor Size	Embedment
3/8"	3 1/2"
1/2"	4 3/4"
5/8"	5 1/2"
3/4"	6 1/2"
1"	9"

- D. Alternate manufactures may be used with written approval by the engineer. All suggested alternates are to have ICBO approval.

## SUBMITTALS

- A. The general contractor shall submit for engineer review shop drawings for the following items:
  - 1. Reinforcing Steel
  - 2. Concrete Mix Designs
  - 3. Structural Steel
- B. All shop drawings must be reviewed and stamped by the general contractor prior to submittal.
- C. Submit manufacturers literature for all materials and products used in construction on the project.

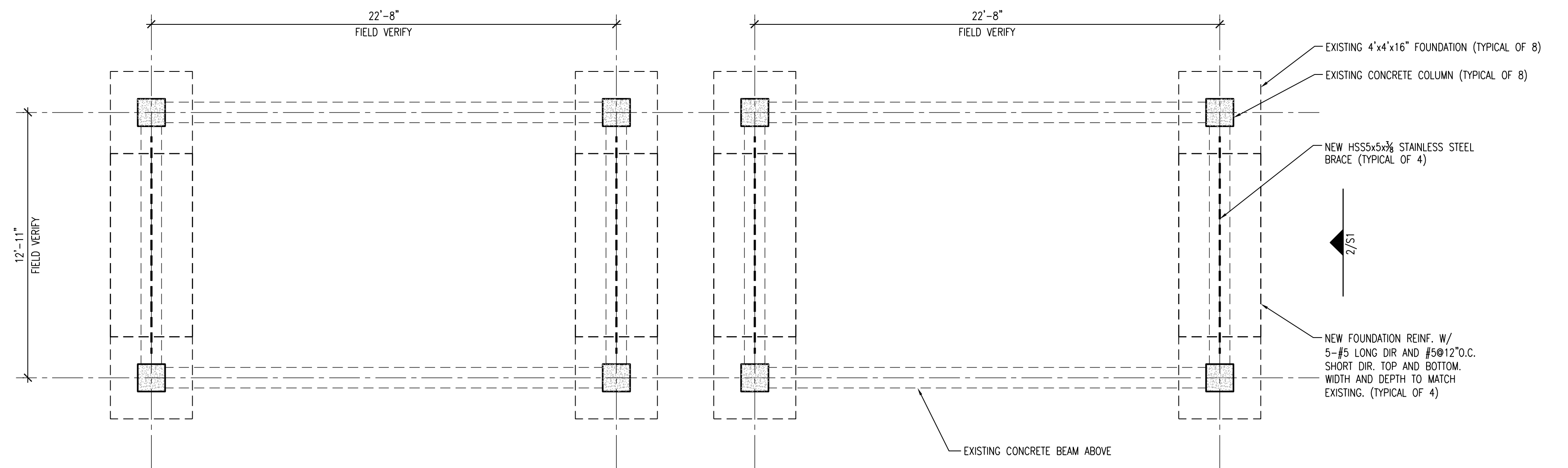
## CONTRACTOR RESPONSIBILITY

- A. The Contract Structural Drawings and Specifications represent the finished structure and, except where specifically shown, do not indicate the means or methods of construction. The Contractor shall supervise and direct the work and shall be solely responsible for all construction means, methods, procedures, techniques, and sequence. The Engineer shall not have control or charge of, and shall not be responsible for, construction means, methods, procedures, techniques, or sequence, for safety precautions and programs in connection with the work, for the acts or omissions of the contractor, subcontractor, or any other persons performing and of the work, or for the failure of and of them to carry out the work in accordance with the Contract Documents.
- B. It is the Contractor's responsibility to inform the Architect and Engineer of any conflicts that exist within the Structural drawings or conflict between the Architectural and Structural drawings in order to receive a clarification before proceeding with work.
- C. It is the Contractor's responsibility to inform the Architect and Engineer of any unforeseen conditions, conflicts or discrepancies with the contract drawings and the existing conditions with regard to the demolition and remodeling of existing buildings.

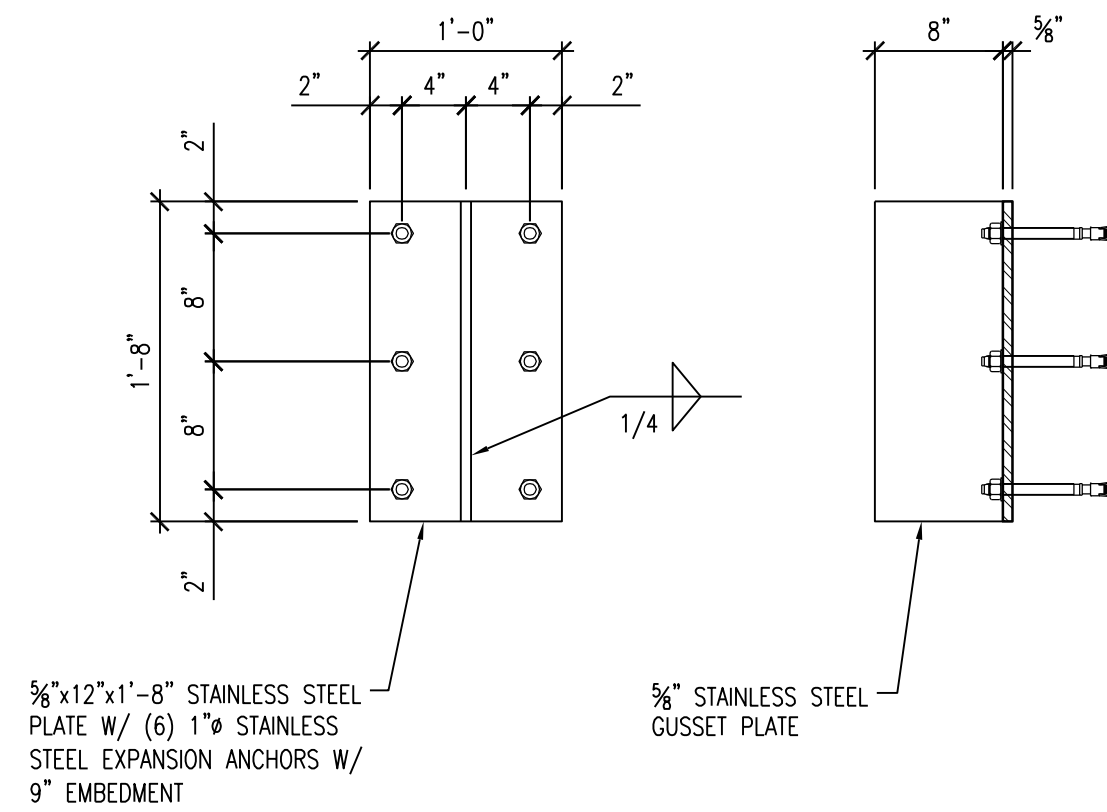
## PLAN NOTES:

- THE GENERAL CONTRACTOR IS TO VERIFY ALL EXISTING CONDITIONS PRIOR TO THE PREPARATION OF SHOP DRAWINGS AND CONSTRUCTION.
- FIELD VERIFY THE LOCATION OF UNDERGROUND CONDUITS BEFORE DIGGING FOUNDATIONS AND COORDINATE THE RELOCATION OF CONDUITS WITH MECHANICAL / ELECTRICAL ENGINEER.
- REPAIR OF CRACKS AND SPALLS ON EXISTING STRUCTURE:
  - SPALLS: CHIP LOOSE CONCRETE BACK TO SOUND SUBSTRATE. APPLY BONDING AGENT TO SURFACE. REPAIR SPALL WITH "SIKACRETE 211".
  - CRACKS: ALL CRACKS ARE TO BE REPAIRED WITH EPOXY INJECTION W/ SIKADUR INJECTION GEL.
- SUPPORT STRUCTURE STRENGTHENING:
  - THE EXISTING CONCRETE COOLING TOWER STRUCTURE IS CAPABLE OF SUPPORTING THE CODE REQUIRED MINIMUM LOADS WITH A WIND SPEED OF 120mph.
  - THE EXISTING CONCRETE COOLING TOWER STRUCTURE WITH THE ADDITION OF THE STEEL BRACE IS CAPABLE OF SUPPORTING A WIND VELOCITY OF 170mph AS REQUESTED BY THE OWNER.
- ALL STEEL IS TO BE STAINLESS STEEL. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

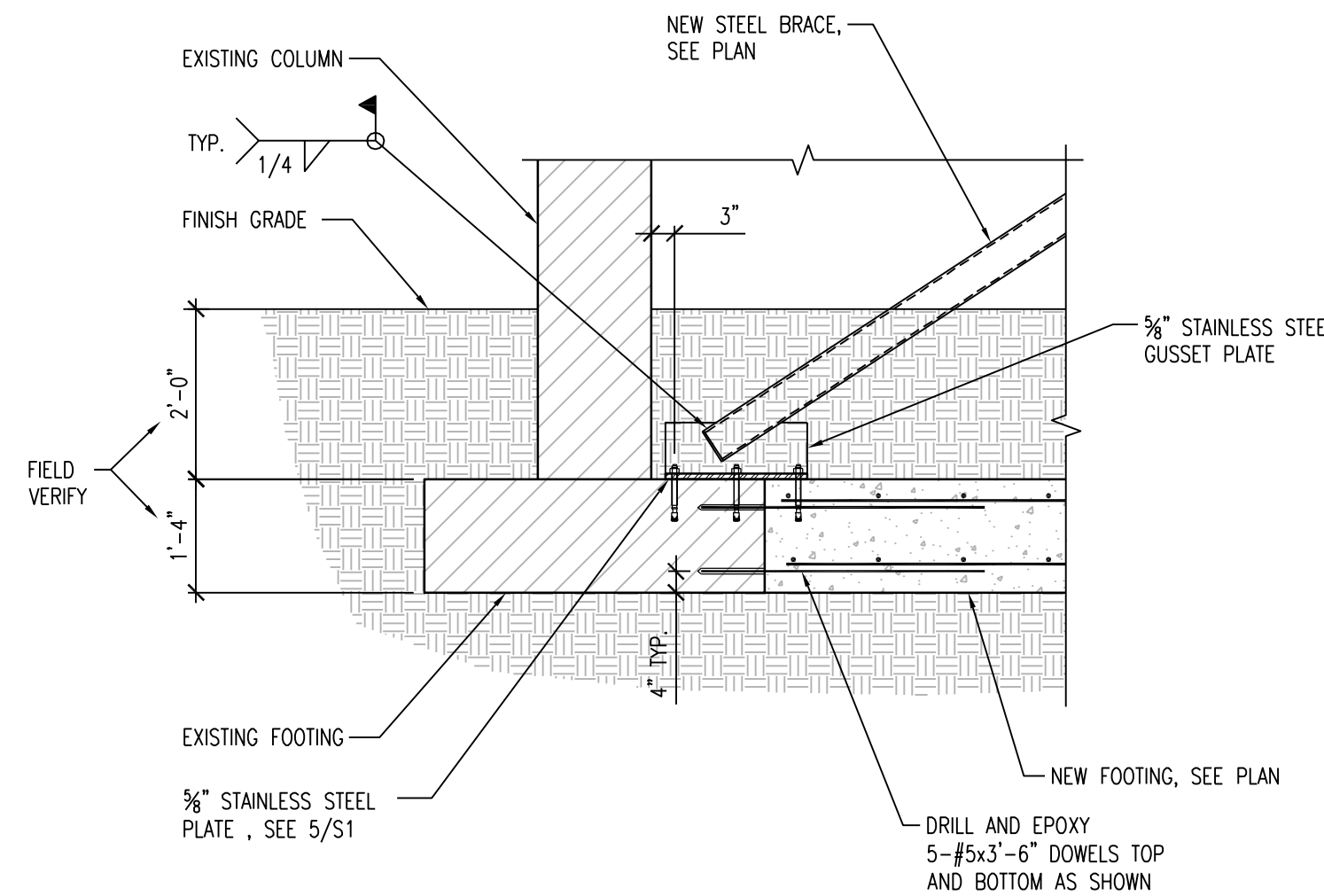
1 FRAMING PLAN  
S1 SCALE: 1/4"=1'-0"



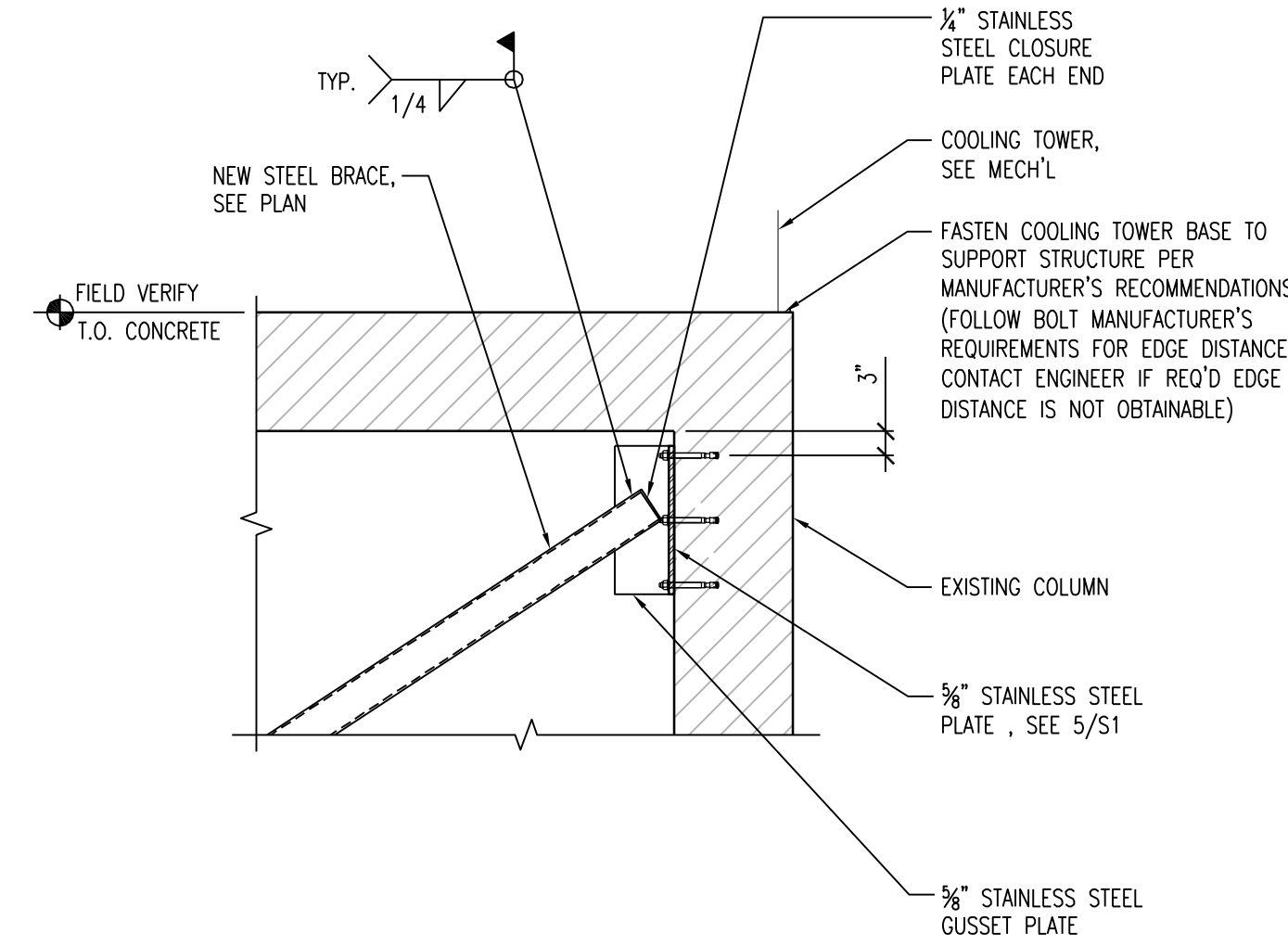
5 CONNECTION PLATE DETAIL  
S1 SCALE: 1"=1'-0"



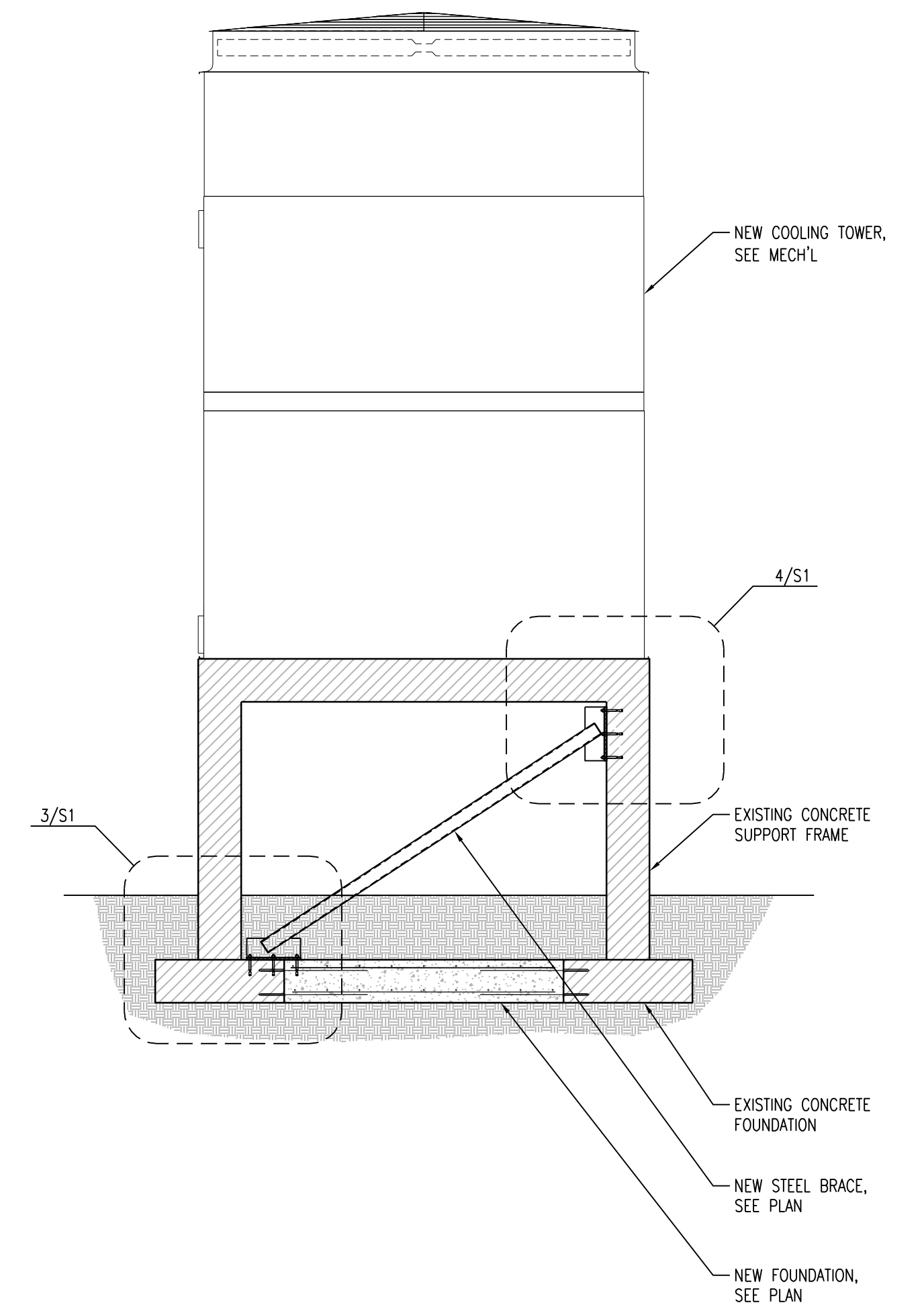
3 BRACE CONNECTION DETAIL  
S1 SCALE: 1/2"=1'-0"



4 BRACE CONNECTION DETAIL  
S1 SCALE: 1/2"=1'-0"



2 ELEVATION  
S1 SCALE: 1/4"=1'-0"



REVISIONS	DATE
DESCRIPTION: Agendum 1	12/3/10

JOHN L. DECARO  
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SHEET TITLE:	LOUVER OPENING STRUCTURAL PLAN AND DETAILS
DRAWN BY:	VW
CHECKED BY:	JD
DATE:	11/18/10
PROJECT NUMBER:	10147
SHEET NUMBER:	S-1