EDINBURG CONSOLIDATED INDEPENDENT SCHOOL DISTRICT

CSP 20-69, ROBERT VELA COOLING TOWER INSTALLATION

801 E Canton Rd, Edinburg, TX 78539



BOARD OF TRUSTEES

OSCAR SALINAS PRESIDENT **CARMEN GONZALEZ VICE-PRESIDENT** ROBERT PENA, JR. SECRETARY MIGUEL "MIKE" FARIAS **MEMBER MEMBER** LETICIA "LETTY" GARCIA **MEMBER** XAVIER SALINAS MEMBER DOMINGA "MINGA" VELA

CONSTRUCTION DOCUMENTS HALFF AVO #37841.001

PROJECT TEAM

MECHANICAL & PLUMBING

Halff Associates, Inc. 5000 West Military Highway, Ste. 100 McAllen, Texas 78503-7446 Tel: 956.445.5203 Fax: 956.664.0282 Email: rTijerina@Halff.com Roberto H. Tijerina, P.E.

STRUCTURAL

Chanin Engineering, LLC

Email: miguel@chaninengineering.com

400 Nolana, Suite H2

McAllen, Texas 78504

Tel: 956.687.9421

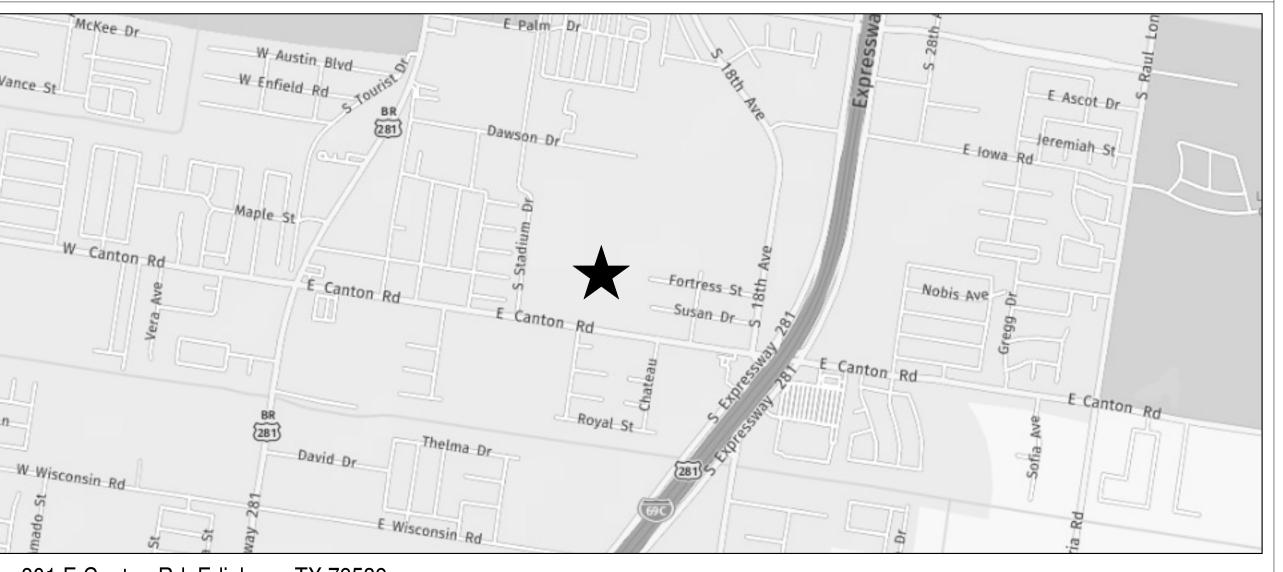
Fax: 956.687.3211

Miguel Chanin, P.E.

ELECTRICAL

Halff Associates, Inc. 100 NE Loop 410, Suite 200 San Antonio, Texas 78216 Tel: 210.704.1373 Email: mHester@Halff.com Mark A. Hester, P.E.

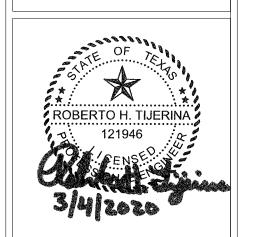
PROJECT LOCATION



801 E Canton Rd, Edinburg, TX 78539

	SHEET INDEX
SHEET NUMBER	SHEET NAME
GENERAL	
G0.01	COVER PAGE
STRUCTURAL	
S1.01	GENERAL NOTES
S1.02	GENERAL NOTES
S2.01	FOUNDATION FRAMING PLAN
S3.01	DETAILS
M0.01 MD1.01 MS1.00	MECHANICAL GENERAL LEGEND MECHANICAL PLUMBING DEMOLITION PLAN MECHANICAL SITE PLAN
M1.01	MECHANICAL/ PLUMBING PLAN
M1.02	MECHANICAL/ PLUMBING SECTIONS & ISOMETRICS
M2.01	MECHANICAL SCHEDULES I
M3.01	MECHANICAL DETAILS I
M4.01	MECHANICAL CONTROL DIAGRAM I
ELECTRICAL E0.00	ELECTRICAL COVER SHEET
E0.00	ELECTRICAL GOVER SHEET
E1.00	ONE LINE DIAGRAM, LOAD ANALYSIS
E4.00	ELECTRICAL DETAILS

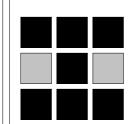




authorized by: ROBERTO H. TIJERINA engineer is an offence under the Texas Engineering Practice Act. The record copy of this drawing is on file at the offices of: Halff Associates

5000 West Military Highway, Suite100 McAllen, Texas 78503-7446 TBPE FIRM #F-312





_	ct No: 37841. d: 03/02/20	001	
ssue	u. U3/U2/20	<u> </u>	
Revis	ions:		
No.	Date	Description	
Draw	n by: JB		
Chec	ked by: RT		
Sheet	t Title		

G0.01

GENERAL NOTES

GENERAL

- 1. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. UNLESS OTHERWISE INDICATED, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE, WORKMEN, AND OTHER PERSONS DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO BRACING, SHORING FOR CONSTRUCTION EQUIPMENT, SHORING FOR THE BUILDING, SHORING FOR THE EARTH BANKS, FORMS, SCAFFOLDING, PLANNING, SAFETY NETS, SUPPORT AND BRACING FOR CRANES, GIN POLES, ETC. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND HE SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE ARCHITECT OR THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS
- 2. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.
- 3. EQUIPMENT FRAMING LOADS, OPENINGS AND STRUCTURE IN ANY WAY RELATED TO HVAC, PLUMBING, OR ELECTRICAL REQUIREMENTS ARE SHOWN FOR BIDDING PURPOSES ONLY. EXACT WEIGHTS AND LOCATIONS OF MECHANICAL EQUIPMENT SHALL BE COORDINATED BY CONTRACTOR. IF THE FINAL LOCATION VARIES FROM THAT SHOWN ON THE PLANS, CONTRACTOR TO NOTIFY ARCHITECT AND ENGINEER FOR APPROVAL BEFORE INSTALLATION.
- 4. SHOULD ANY OF THE DETAILED INSTRUCTIONS SHOWN ON THE PLANS CONFLICT WITH THESE STRUCTURAL NOTES, THE SPECIFICATIONS, OR WITH EACH OTHER, THE STRICTEST PROVISION SHALL GOVERN.
- 5. THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE AND SHALL BE RESPONSIBLE FOR CONDITIONS OF ALL WORK AND MATERIALS.
- 6. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS AND ELEVATIONS CONTRACTOR SHALL REPORT ANY DISCREPANCIES IN WRITING TO THE ARCHITECT. ANY CONFLICT BETWEEN THE DRAWING AND SPECIFICATIONS OF THE VARIOUS TRADES INVOLVED SHALL BE REPORTED TO THE ARCHITECT AND ENGINEER.
- 7. DETAILS SHOWN ON DRAWINGS APPLY AT SIMILAR CONDITIONS.
- 8. ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL STANDARDS AND TO ALL APPLICABLE PROVISIONS OF THE GOVERNING BUILDING CODE.
- 9. THE ARCHITECT AND ENGINEER SHALL BE NOTIFIED IN WRITING WHEN WORK COMMENCES.
- 10. CONTRACTOR SUBSTITUTIONS: ANY MATERIALS OR PRODUCTS THAT ARE SUBMITTED FOR APPROVAL THAT ARE DIFFERENT FROM THE MATERIALS OR PRODUCTS SPECIFIED IN THE CONTRACT DOCUMENTS WILL ONLY BE CONSIDERED IF THE FOLLOWING CRITERIA ARE SATISFIED.
 - A) A COST SAVING TO THE OWNER IS DOCUMENTED AND SUBMITTED WITH THE
 - B) THE MATERIAL OR PRODUCT HAS BEEN APPROVED BY THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO) AND THE ICBO REPORT IS

STRUCTURAL OBSERVATION

SUBMITTED WITH THE REQUEST.

- THE PROFESSIONAL ENGINEER OR HIS/HER AUTHORIZED REPRESENTATIVE SHALL CONDUCT ALL STRUCTURAL OBSERVATIONS. STRUCTURAL OBSERVATIONS SHALL BE FOR THE PURPOSE OF ASCERTAINING GENERAL COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS. HOWEVER, SUCH OBSERVATION VISITS SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OBLIGATIONS AND RESPONSIBILITIES TO THE CONSTRUCTION DOCUMENTS.
- 2. ITEMS THAT REQUIRE A STRUCTURAL OBSERVATION ARE AS FOLLOWS: D. FRAMING OF STEEL STRUCTURE
- NOTIFY ENGINEER 24 HOURS IN ADVANCE WHEN A STRUCTURAL OBSERVATION IS REQUIRED.
- 4. WORK SHALL NOT CONTINUE AT THESE AREAS UNTIL OBSERVATION AND APPROVAL BY ENGINEER. FAILURE BY THE CONTRACTOR TO PROVIDE PROPER NOTICE FOR AN OBSERVATION VISIT AT THE REQUIRED TIME OR ADDITIONAL WORK PERFORMED WITHOUT AN OBSERVATION VISIT WILL BE DONE AT CONTRACTOR'S RISK AND MAY BE SUBJECT TO COMPLETE OR PARTIAL REMOVAL TO VERIFY COMPLIANCE OF PREVIOUS WORK.

SHOP DRAWINGS & SUBMITTALS

- 1. SUBMITTAL THAT WILL BE REQUIRED FOR APPROVAL INCLUDE: A. CONCRETE MIX DESIGN B. CURING COMPOUND FOR CONCRETE C. REINFORCING STEEL D. STRUCTURAL STEEL
- 2. DEFERRED SUBMITTALS THAT WILL REQUIRE APPROVAL INCLUDE: NONE
- 3. DEFERRED SUBMITTALS SHALL BE DESIGNED BY A TEXAS REGISTERED PROFESSIONAL ENGINEER ACCORDING TO THE DESIGN CRITERIA STATED IN THE PLANS AND SPECIFICATIONS, AND AS REQUIRED BY THE RESPECTIVE BUILDING CODE, WHICHEVER IS GREATER. THE SUBMITTAL SHALL INCLUDE SIGNED AND SEALED CALCULATIONS.
- 4. ALLOW (2) WEEKS MINIMUM FOR REVIEW OF SHOP DRAWINGS.
- 5. PRIOR TO ISSUING THE SUBMITTALS TO THE ENGINEER, THE CONTRACTOR SHALL REVIEW THE SHOP DRAWINGS. CONTRACTOR MUST VERIFY ALL DIMENSION WITH ARCHITECTURAL
- 6. REVIEW OF SHOP DRAWINGS BY THE ENGINEER IS FOR GENERAL CONFORMANCE TO THE STRUCTURAL DRAWINGS. APPROVAL OF THE SHOP DRAWINGS BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR FOR ANY ERRORS IN DIMENSIONS OR MATERIAL INDICATED ON THE SHOP DRAWINGS.

DESIGN CRITERIA

- 1. DESIGN LOADS, STRUCTURAL ANALYSIS AND PREPARATION OF STRUCTURAL MEMBERS ARE BASED ON THE FOLLOWING CRITERIA:
- 2. CODE: IBC 2012
- A. ROOF DEAD LOAD (COOLING TOWER):
- B. MECHANICAL LOAD: THE GENERAL CONTRACTOR SHALL SUBMIT ACTUAL WEIGHTS AND LOCATIONS OF EQUIPMENT TO BE USED IN THE PROJECT TO THE STRUCTURAL ENGINEER FOR VERIFICATION OF LOADS USED IN THE DESIGN AT LEAST TWO WEEKS PRIOR TO FABRICATION AND CONSTRUCTION OF THE SUPPORTING STRUCTURE
- 4. LATERAL LOADS A. WIND SPEED (V-ULT): 140 MPH WIND SPEED (V-ASD) 108 MPH B. EXPOSURE CATEGORY: C. IMPORTANCE FACTOR: D. BUILDING CATEGORY:
- 5. GEOTECHNICAL ENGINEERING REPORT: NOT PROVIDED

E. SEISMIC DESIGN CATEGORY:

F. SITE CLASS:

GEOTECHNICAL INVESTIGATION

THE OWNER OF THIS PROJECT HAS DECLINED TO FURNISH A GEOTECHNICAL INVESTIGATION REPORT THEREFORE THE FOUNDATION DESIGN WAS BASED UPON AVERAGE SOIL CONDITIONS IN HIDALGO COUNTY, TEXAS. IF HIGHLY EXPANSIVE SOILS OR SOFT SOILS ARE ENCOUNTERED, DIFFERENTIAL FOUNDATION MOVEMENTS CAN BE EXPECTED. ALTHOUGH WE ATTEMPT TO MAKE ASSUMPTIONS THAT WILL NOT IMPAIR STRUCTURAL INTEGRITY OF THE PROJECT, WE DO NOT HAVE THE EXPERTISE OR BENEFIT OF LABORATORY INVESTIGATIONS OF A GEOTECHNICAL ENGINEER, THEREFORE THIS FIRM CANNOT ASSUME RESPONSIBILITY FOR THE PERFORMANCE OF THE DESIGN FOUNDATION SHOULD ACTUAL SURFACE OR SUBSURFACE SOIL CONDITIONS VARY FROM THOSE ASSUMED. FOLLOWING ASSUMPTIONS:

1. SOIL BEARING PRESSURE (AT PROPOSED SITE) = 1000 PSF

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE TO AISC SPECIFICATIONS.

- ASTM A992 GRADE 50

- CUT FROM W-SHAPES

- ASTM A500 GRADE B

- ASTM A500 GRADE B

- ASTM A36

- ASTM A36

ASTM A36

- ASTM A36

- ASTM A325

- SERIES E70

- 2. MATERIALS USED SHALL BE AS FOLLOWS=
 - A. STRUCTURAL W-SHAPES
- B. STRUCTURAL M-SHAPES AND S-SHAPES
- C. STRUCTURAL T-SHAPES
- D. CHANNELS AND ANGLES E. ROUND HOLLOW STRUCTURAL SECTIONS
- F. SQUARE AND RECTANGULAR HOLLOW
- STRUCTURAL SECTIONS
- G. STRUCTURAL PLATES H. STRUCTURAL BARS
- I. HIGH STRENGTH BOLTS
- J. ELECTRODES
- EDITION OF THE AMERICAN WELDING SOCIETY SPECIFICATIONS. 4. CONNECTIONS NOT DETAILED AND/OR SCHEDULED ON STRUCTURAL DRAWINGS SHALL BE

3. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS IN ACCORDANCE WITH THE LATEST

- DETAILED BY FABRICATOR AND MARKED FOR ENGINEERS APPROVAL. CONNECTIONS TO BE DESIGNED TO AISC SPECIFICATIONS AND SHALL BE CAPABLE OF SUPPORTING 55% OF THE MAXIMUM UNIFORM LOAD CAPACITY FOR THE SPAN SPECIFIED, SHOWN IN THE TABLES OF UNIFORM CONSTANTS OF THE AISC MANUAL OF STEEL CONSTRUCTION.
- 5. REFER TO ARCHITECTURAL PLANS FOR ANY MISCELLANEOUS STEEL NOT SHOWN ON STRUCTURE DRAWING. MISCELLANEOUS STEEL AND CONNECTIONS SHALL BE DESIGNED BY STEEL FABRICATOR.
- 6. HOT DIP GALVANIZE, IN ACCORDANCE WITH ASTM A123 AND ASTM A153, STRUCTURAL STEEL AND FASTENERS PERMANENTLY EXPOSED TO THE WEATHER. REPAIR DAMAGED AREAS AND WELDS MADE AFTER GALVANIZING IN ACCORDANCE WITH ASTM A780 WITH ORGANIC ZINC RICH PAINT COMPLYING WITH DOD-P-21035 OR MIL-P-26915, MULTIPLE COATS TO DRY FILM THICKNESS OF 4 MILS.
- 7. STEEL SUPPORTING OR CONNECTED TO HVAC AND OTHER EQUIPMENT AS SHOWN ON THE DRAWINGS IS SHOWN FOR BIDDING PURPOSES ONLY CONTRACTOR SHALL COORDINATE EXACT LOCATION AND SIZE BEFORE COMMENCING WORK.
- 8. STRUCTURAL STEEL SHALL BE PAINTED WITH ONE COAT OF RUST INHIBITIVE PAINT.
- 9. STRUCTURAL DRAWINGS SHALL NOT BE REPRODUCED IN WHOLE OR IN PART FOR SHOP DRAWING SUBMITTALS.
- 10. PROVIDE 1 TON OF RED IRON ALLOWANCE TO BE USED AS DIRECTED BY STRUCTURAL ENGINEER. INCLUDE LABOR COSTS IN THE ALLOWANCE. ANY UNUSED ALLOWANCE SHALL BE CREDITED BACK TO OWNER AT A COST OF \$3500 PER TON.
- 11. ALL WELDED CONNECTION SHALL BE MADE WITH A 1/4" FILLET WELD U.N.O.
- 12. PROVIDE 1/2" GAP AT ALL PENETRATIONS THROUGH CMU WALL AND INFILL WITH ELASTOMERIC MATERIAL.
- 13. STEEL FABRICATOR SHALL BE CERTIFIED BY ONE OF THE FOLLOWING: AISC/ IBC/ IAS-ICC

STEEL REINFORCING

- 1. ALL REINFORCEMENT SHALL BE NEW BILLET STEEL CONFORMING TO ASTM A-615 GRADE 60.
- 2. REINFORCING STEEL SHALL BE DESIGNED, DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH THE LATEST ACI DETAILING MANUAL (SP-66) AND CSRI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE, (ACI #315) LATEST EDITIONS.
- 3. BARS SCHEDULED OR DETAILED "CONT" SHALL BE SPLICED ONLY WHEN UNAVOIDABLE AT POINTS OF MINIMUM STRESS AND WITH A MINIMUM LAP AS FOLLOWS: A. HORIZONTAL BARS w/ MORE THAN 12" OF FRESH CONCRETE CAST BELOW LAPS.
 - #6 BARS AND SMALLER 57 BAR DIAMETERS #7 BARS AND BIGGER - 72 BAR DIAMETERS
 - #6 BARS AND SMALLER 44 BAR DIAMETERS #7 BARS AND BIGGER - 55 BAR DIAMETERS
- C. ALL SPLICES TO BE STAGGERED A MINIMUM OF 4'-0". TOP BAR AND BOTTOM BAR SPLICES TO BE LOCATED AT MID-SPAN AND WITHIN 1/3 SPAN RESPECTIVELY.
- 4. CORNER REINFORCING BARS SHALL BE USED AT ALL CORNERS AND INTERSECTIONS
- 5. EXTEND THE SLAB REINFORCING STEEL PERPENDICULAR TO EXTERIOR GRADE BEAM TO THE TOP OUT SIDE REINFORCING BAR OF BEAM.
- 6. SPACE REINFORCING BARS WITH MINIMUM CLEAR SPACING IN ACCORDANCE WITH ACI 318 OF ONE BAR DIAMETER, BUT NOT LESS THAN 1 INCH. FOR COMPRESSION MEMBERS, SPACE AT A MINIMUM OF 1.5 INCHES OR 1.5 BAR DIAMETERS, WHICHEVER IS GREATER.
- 7. WHERE REINFORCING BARS ARE PLACED IN MULTIPLE LAYERS, PLACE UPPER BARS DIRECTLY ABOVE LOWER BARS.
- 8. MAINTAIN CONCRETE COVER AROUND REINFORCEMENT IN ACCORDANCE WITH ACI 318 AND AS FOLLOWS:

- 1 INCH

- A. FOOTING AND CONCRETE CAST AGAINST EARTH - 3 INCHES B. EXPOSED TO EARTH OR WEATHER #6 BARS AND BIGGER #5 BARS AND SMALLER - 1.5 INCHES - 1.5 INCHES C. BEAMS AND COLUMNS
- 9. REPAIR ANY DAMAGE TO VAPOR RETARDER PER MANUFACTURER SPECIFICATIONS.
- 10. ADDITIONAL REINFORCING TO BE PROVIDED ON SITE FOR USE AS DIRECTED BY STRUCTURAL ENGINEER.
 - #4 BARS 100 FT. #5 BARS - 100 FT.

D. SLABS AND WALLS

#6 BARS - 100 FT.

EXCAVATION NOTES

- 1. CONSTRUCTION AREAS REMOVE AT LEAST 8 INCHES OF TOP SOIL, VEGETATION, DEBRIS, ETC., FROM THE PROPOSED BUILDING AREA TO A DISTANCE OF 3'-0" OUTSIDE THE BUILDING LINE PROPOSED. FURTHER, REMOVE THE EXISTING SUBGRADE SOILS DOWN TO AN ELEVATION OF ABOUT 24"BELOW EXISTING GRADE ELEVATION.
- 2. EXPOSED SUBGRADE SHOULD BE THOROUGHLY PROOF ROLLED IN ORDER TO LOCATE AND DENSIFY ANY WEAK, COMPRESSIBLE ZONES. WEAK OR SOFT AREAS IDENTIFIED DURING PROOF ROLLING SHOULD BE REMOVED AND REPLACED WITH A SUITABLE, COMPACTED SELECT FILL IN ACCORDANCE WITH THE REQUIREMENTS BELOW. PRIOR TO FILL PLACEMENT, THE EXPOSED SUBGRADE SHOULD BE MOISTURE CONDITIONED BY SCARIFYING TO A MINIMUM DEPTH OF 12" AND RECOMPOSING TO A MINIMUM OF 98% OF THE MAXIMUM DRY DENSITY AS DETERMINED FROM THE ASTM D1698 COMPACTION TEST. THE MOISTURE CONTENT SHOULD BE MAINTAINED WITHIN THE OPTIMUM TO 3% ABOVE.
- 3. FILL BACK TO REQUIRED GRADE (A MINIMUM OF 24" OF SELECT FILL IS REQUIRED. REFER TO CIVIL PLANS FOR FINISHED FLOOR ELEVATION TO DETERMINE ADDITIONAL AMOUNT OF SELECT FILL NEEDED) WITH MATERIAL SELECTED AND COMPACTED IN ACCORDANCE WITH THE REOUIREMENTS BELOW.
- 4. SELECT FILL, WHEN PROPERLY SLAKED AND TESTED BY STANDARD LABORATORY METHODS, SHALL MEET THE FOLLOWING REQUIREMENTS:
- A. MEET THE TxDOT 2014 STANDARD SPECIFICATION FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES, ITEM 247 FLEXIBLE BASE, TYPE A, TYPE B, OR TYPE C, GRADES 1 THROUGH 3.

ALTERNATIVELY

- B. THE FOLLOWING SOILS, AS CLASSIFIED ACCORDING TO THE USCS, MAY BE CONSIDERED SATISFACTORY FOR USE AS SELECT FILL MATERIALS AT THIS SITE: SC, GC, AND COMBINATIONS OF THESE SOILS. IN ADDITION TO THE USCS CLASSIFICATION, ALTERNATIVE SELECT FILL MATERIALS SHALL HAVE A MAXIMUM LIQUID LIMIT OF 35 PERCENT, A PLASTICITY INDEX BETWEEN 5 AND 17 PERCENT, AND A MAXIMUM PARTICLE SIZE NOT EXCEEDING 4 INCHES OR ONE-HALF THE LOOSE LIFT THICKNESS. WHICHEVER IS SMALLER.
- 5. SAMPLES OF PROPOSED SELECT FILL SHALL BE FURNISHED TO THE TESTING LABORATORY 7 DAYS PRIOR TO INSTALLATION TO PERMIT TIME FOR SPECIFICATION COMPLIANCE INSPECTION AND APPROVAL.
- 6. SELECT FILL UNDER ALL FLOORS AND WALKS SHALL BE COMPACTED IN THE FIELD IN LIFTS NOT TO EXCEED 8" TO 98% OF THE MAXIMUM DENSITY, 2% BELOW OR 2% ABOVE OF THE OPTIMUM MOISTURE CONTENT, AS DETERMINED BY TEST METHOD ASTM D-1698
- 7. SITE PREPARATION TESTING SHALL BE AS FOLLOWS:
- A. ATTERBERG LIMITS OF SELECT FILL MATERIAL: (1) ONE TEST PER 5,000 CY
- B. COMPACTION TEST:
- TO BE PERFORMED PER LIFT ON TEST PER 3,000 SF MINIMUM OF (4) FOUR TEST PER LIFT
- 8. IF 5' PERIMETER OVER EXCAVATION IS NOT COVERED BY CONCRETE FLATWORK, PROVIDE 2' THICK CLAY CAP IN OVER EXCAVATED ZONE. CLAY CAP SHALL CONSIST OF MATERIAL WITH P.I. **RANGE OF 20-35.**
- 9. GEOTECHNICAL REPORT SHALL BE CONSIDERED A PART OF THE CONSTRUCTION DOCUMENTS. CONTRACTOR TO REVIEW AND COMPLY WITH ALL EARTHWORK AND GRADING REQUIREMENT IN GEOTECHNICAL REPORT.
- 10. FINAL SITE GRADING TO SLOPE AWAY FROM THE STRUCTURE AND SHALL PREVENT WATER FROM PONDING IN THE AREAS ADJACENT TO THE STRUCTURE FOR A MINIMUM DISTANCE OF 10'-0". ANY PONDING CLOSE TO THE STRUCTURE MAY CREATE VOLUMETRIC CHANGES IN THE SOIL AND MAY LEAD TO LESS THAN OPTIMUM PERFORMANCE OF THE BUILDING FOUNDATION.
- 11. IT IS ALSO IMPORTANT TO MINIMIZE CHANGES IN MOISTURE CONTENT CREATED BY ROOF DRAINAGE, PLUMBING LEAKS, LANDSCAPING / IRRIGATION, AND DOWNSPOUT OUTFALLS. ANY PLUMBING LEAKS SHALL BE REPAIRED AS SOON AS POSSIBLE AND PROPER DRAINAGE PROVIDED AWAY FROM THE BUILDING. LARGE BUSHES AND TREES SHALL NOT BE PLACED IN AREAS DIRECTLY ADJACENT TO THE FOUNDATION AS THEIR ROOT SYSTEM MAY CREATE SUBSTANTIAL MOISTURE DIFFERENTIALS THAT MAY LEAD TO VOLUME CHANGES IN THE SOIL. LARGE BUSHES AND TREES SHOULD BE LOCATED AT A REASONABLE DISTANCE FROM THE FOUNDATION.

CONCRETE

AND SLAB

CONSTRUCTION JOINTS.

- 1. ALL CONCRETE WORK SHALL BE EXECUTED IN ACCORDANCE WITH ACI 318 AND ACI 301
- 2. CEMENT SHALL CONFORM TO ASTM CI50 TYPE I AGGREGATE SHALL CONFORM TO ASTM C33.
- CONCRETE SHALL HAVE A MINIMUM 28 DAYS COMPRESSIVE STRENGTH AS FOLLOWS: MEMBER TYPE FOUNDATION
- 4. INSTALL 10 MIL VAPOR RETARDER UNDER SLABS ON GRADE AND ALONG SIDE OF TRENCHES IN ACCORDANCE WITH ASTM E1643. LAP JOINTS MINIMUM OF 12 INCHES.
- 5. PLACE CONCRETE CONTINUOUSLY BETWEEN PRE-DETERMINED EXPANSION AND
- 6. ALL CONSTRUCTION JOINT LOCATIONS TO BE APPROVED BY ARCHITECT AND STRUCTURAL
- 7. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED.
- 8. CURE CONCRETE IN ACCORDANCE WITH ACI 308.1
- 9. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR LOCATIONS OF ALL DEPRESSIONS, OPENINGS, ACCESSORIES, ETC.
- 10. CONDUIT AND PLUMBING LINES SHALL BE PLACED BELOW SLAB REINFORCING AND SHALL BE NO BIGGER THAN 1 INCH.
- 11. FLYASH MAY BE USED TO REPLACE A PORTION OF THE PORTLAND CEMENT. THE RATIO OF FLYASH TO THE TOTAL OF THE FLYASH AND CEMENT IN A MIX SHALL NOT EXCEED 20%.
- 12. ALL FLOORS SHALL BE CONSTRUCTED WITH A MINIMUM FLATNESS FF = 35 AND A MINIMUM
- LEVELNESS OF FL = 25
- 13. CONTRACTION JOINTS TO BE INSTALLED WITHIN 12 HOURS OF POURING FOUNDATION.

FLYASH SHALL CONFORM TO ASTM C618, TYPE C OR F.

- 14. TESTING OF CONCRETE SHALL BE DONE AS FOLLOWS: 1) SETS SHALL CONSIST OF 3 CYLINDERS
- ONE TESTED AT 7 DAYS
- TWO TESTED AT 28 DAYS 2) ONE SET SHALL BE TAKEN FOR EACH 150 CY AND FOR EVERY 5000 SF OF SURFACE
- AREA AND AT LEAST ONCE PER DAY OF POURING 3) A MINIMUM OF 3 SETS SHALL BE TAKEN FOR EACH CLASS OF CONCRETE
- 15. NO WATER SHALL BE ADDED TO THE CONCRETE AT THE JOBSITE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE CONCRETE SUPPLIER TO ENSURE A PUMPABLE AND WORKABLE MIX WITHOUT THE ADDITION OF WATER AT THE JOBSITE. THE USE OF PLASTICIZERS, RETARDANTS AND OTHER ADDITIVES SHALL BE AT THE OPTION OF THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER. FOLLOW THE RECOMMENDATIONS OF THE MANUFACTURER FOR THE PROPER USE OF ADDITIVES. THE USE OF CALCIUM CHLORIDE OR OTHER CHLORIDE BEARING SALTS SHALL NOT BE PERMITTED.
- 16. PLACE CONCRETE IN A MANNER SO AS TO PREVENT SEGREGATION OF THE MIX. DELAY FLOATING AND TROWELING OPERATIONS UNTIL CONCRETE HAS LOST SURFACE WATER SHEEN OR ALL FREE WATER. DO NOT SPRINKLE FREE CEMENT ON THE SLAB SURFACE. FINISHING OF SLAB SURFACES SHALL COMPLY WITH THE RECOMMENDATIONS OF AC1 302.1
- 17. UNLESS SPECIFIED, CONCRETE MUST REACH THE FOLLOWING PERCENTAGES OF ITS 28-DAY COMPRESSIVE STRENGTH (F'c), BEFORE FORMS MAY BE REMOVED.
- WALL, COLUMNS, & BEAM SIDES. .40% JOIST PANS & BEAM BOTTOMS (IF RESHORED) .70% SHORING FOR FLOOR SYSTEMS (IF NOT RESHORED)...
- 18. NO CONCRETE SHALL BE PLACED OUTSIDE OF THESE SPECIFICATIONS WITHOUT THE OWNER'S PRIOR APPROVAL. ANY ITEMS NOT IN COMPLIANCE WITH THE OUTLINED SPECIFICATION SHALL BE REPORTED TO THE OWNER AND STRUCTURAL ENGINEER WITHIN
- 19. CONSTRUCTION VEHICLE LOADS SHALL NOT BE PERMITTED ON ELEVATED SLABS AT ANY
- 20. ALL RETAINING WALLS TO BE SHORED UNTIL UPPER SLAB IS IN PLACE AND HAS REACHED 70% OF ITS DESIGN STRENGTH OR THE RETAINING WALL HAS REACHED 100% OF ITS DESIGN STRENGTH. PROVIDE GRANULAR BACKFILL AND PERFORATED DRAIN PIPE CONNECTED TO SITE DRAINAGE, RE: CIVIL PLAN.

CONTRACTOR NOTE

THE STRUCTURAL SYSTEM FOR THIS PROJECT SHALL NOT BE CONSTRUCTED BY USING THE STRUCTURAL DRAWINGS ALONE. THESE DRAWINGS WERE DEVELOPED FROM DATA DERIVED PRIMARILY FROM THE ARCHITECTURAL DRAWINGS AND SECONDARILY FROM MEP, CIVIL AND OTHER DISCIPLINES' DOCUMENTS. IT IS INTENDED THAT CONSTRUCTION PROCEED BY UTILIZING ALL OF THE INFORMATION CONTAINED IN THE ENTIRE SET OF CONSTRUCTION DOCUMENTS TAKEN AS A WHOLE; FAILURE TO DO SO WILL RESULT IN ERRORS WHICH SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.

© COPYRIGHT 2020 - ALL RIGHTS RESERVED

These drawings, as instruments of professional service, are the property of Chanin Engineering LLC for use solely with respect to this Project and shall not be reproduced for other purposes.

The Professional Engineer whose seal appears on the structural construction documents is the project Structural Engineer-of-Record (SER) who bears legal responsibility for the performance of the structural framing relating to the public health, safety and welfare. No other party, whether or not a Professional Engineer, may complete, correct, revise, delete or add to these construction documents or perform inspections of the work without the written permission of the SER.

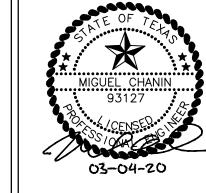


Ŋ

Π₹

ROBI WEF







Project No: 19325 Issued: 04 February, 2020 No. Date Checked by: MC

GENERAL NOTES

S1.01

GENERAL NOTES

STRUCTURAL TESTS AND SPECIAL INSPECTION

- 1. THE OWNER SHALL EMPLOY A SPECIAL INSPECTOR TO PROVIDE INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THIS SECTION.
- 2. THE FOLLOWING TERMS AND PHRASES SHALL HAVE THE MEANINGS SHOWN BELOW AS IT PERTAINS TO THIS SECTION,
- A. APPROVED AGENCY AN ESTABLISHED AND RECOGNIZED AGENCY REGULARLY ENGAGED IN CONDUCTING AND FURNISHING SPECIAL INSPECTION SERVICES.
- B. APPROVED FABRICATOR AN ESTABLISHED AND QUALIFIED FIRM APPROVED BY BUILDING OFFICIAL. SPECIAL INSPECTIONS ARE NOT REQUIRED WHEN WORK IS PERFORMED ON THE PREMISES OF AN APPROVED FABRICATOR.
- C. SPECIAL INSPECTION, CONTINUOUS THE FULL TIME OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION. D. SPECIAL INSPECTION, PERIODIC - THE PART TIME OR INTERMITTENT

OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION.

- 3. SPECIAL INSPECTORS SHALL KEEP RECORDS OF ALL INSPECTIONS AND SHALL FURNISH REPORTS TO THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THE DISCREPANCIES ARE NOT CORRECTED THEY SHALL BE BROUGHT TO THE ATTENTION OF THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.
- 4. THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION.
- 5. SPECIAL INSPECTION FOR STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF AISC 360.

TABLE 1705.3

	0.0		
REQUIRED VERIFICATION AND INSPE	CTION OF C	ONCRETE	CONSTRUCTION

REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION											
VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE							
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT.		X	ACI 318: 3.5, 7.1-7.7	1910.4							
2. INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1705.2.2, ITEM 2b.			AWS D1.4 ACI 318: 3.5.2								
3. INSPECTION OF ANCHORS CAST IN CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED OR WHERE STRENGTH DESIGN IS USED.		X	ACI 318: 8.1.3, 21.2.8	1908.5, 1909.1							
4. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.		X	ACI 318. 3.86, 8.1.3, 21.2.8	1909.1							
5. VERIFYING USE OF REQUIRED DESIGN MIX.		X	ACI 318: Ch. 4, 5.2-5.4	1904.2, 1910.2, 1910.3							
6. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X		ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1910.10							
7. INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X		ACI 318: 5.9, 5.10	1910.6, 1910.7, 1910.8							
8. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.		X	ACI 318: 5.11-5.13	1910.9							
9. INSPECTION OF PRESTRESSED CONCRETE: a. APPLICATION OF PRESTRESSING FORCES. b. GROUTING OF BONDED PRESTRESSING TENDONS IN THE SEISMIC-FORCE-RESISTING SYSTEM.	X X		ACI 318: 18.20 ACI 318: 18.18.4								
10. ERECTION OF PRECAST CONCRETE MEMBERS.		Х	ACI 318: Ch.16								
11. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POSTTENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.		Х	ACI 318: 6.2								
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.		X	ACI 318: 6.1.1								

TABLE 1705.6 REQUIRED VERIFICATION AND INSPECTION OF SOILS

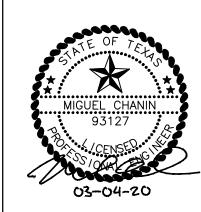
	VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1.	. VERIFY MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.		X
2	. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.		X
3	. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.		X
4	. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	
5	. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.		X

REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
1. MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS:				
a. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.		Х	APPLICABLE ASTM MATERIAL SPECIFICATIONS; AISC 360, SECTION A3.3	
b. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.		X		
2. INSPECTION OF HIGH-STRENGTH BOLTING:				
a. BEARING-TYPE CONNECTIONS.		X	AISC 360, SECTION M2.5	
b. SLIP-CRITICAL CONNECTIONS.	X	X	Ande doo, bleffer wiz.	
3. MATERIAL VERIFICATION OF STRUCTURAL STEEL:				
a. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.			ASTM A 6 OR ASTM A 568	
b. MANUFACTURERS' CERTIFIED MILL TEST REPORTS.			ASTM A 6 OR ASTM A568	
4. MATERIAL VERIFICATION OF WELD FILLER MATERIALS:				
a. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.			AISC 360, SECTION A3.5	
b. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.				
5. INSPECTION OF WELDING: a. STRUCTURAL STEEL:				
1) COMPLETE AND PARTIAL PENETRATION GROOVE WELDS.	X			
2) MULTIPASS FILLET WELDS.	X		AWS D1.1	
3) SINGLE-PASS FILLET WELDS > 5/16"	х			
4) SINGLE-PASS FILLET WELDS < 5/16"		X		
5) FLOOR AND ROOF DECK WELDS.		X	AWS D1.3	
b. REINFORCING STEEL:				
1) VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.		X		
2) REINFORCING STEEL-RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL REINFORCED CONCRETE SHEAR WALLS AND SHEAR REINFORCEMENT.	X		AWS D1.4 ACI 318: 3.5.2	
3) SHEAR REINFORCEMENT.	х			
4) OTHER REINFORCING STEEL.		X		
6. INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS: a. DETAILS SUCH AS BRACING AND STIFFENING. b. MEMBER LOCATIONS. c. APPLICATION OF JOINT DETAILS AT EACH CONNECTION.		x 		

ELISD ROBERT VELA COOLING TOWER INSTALLATION

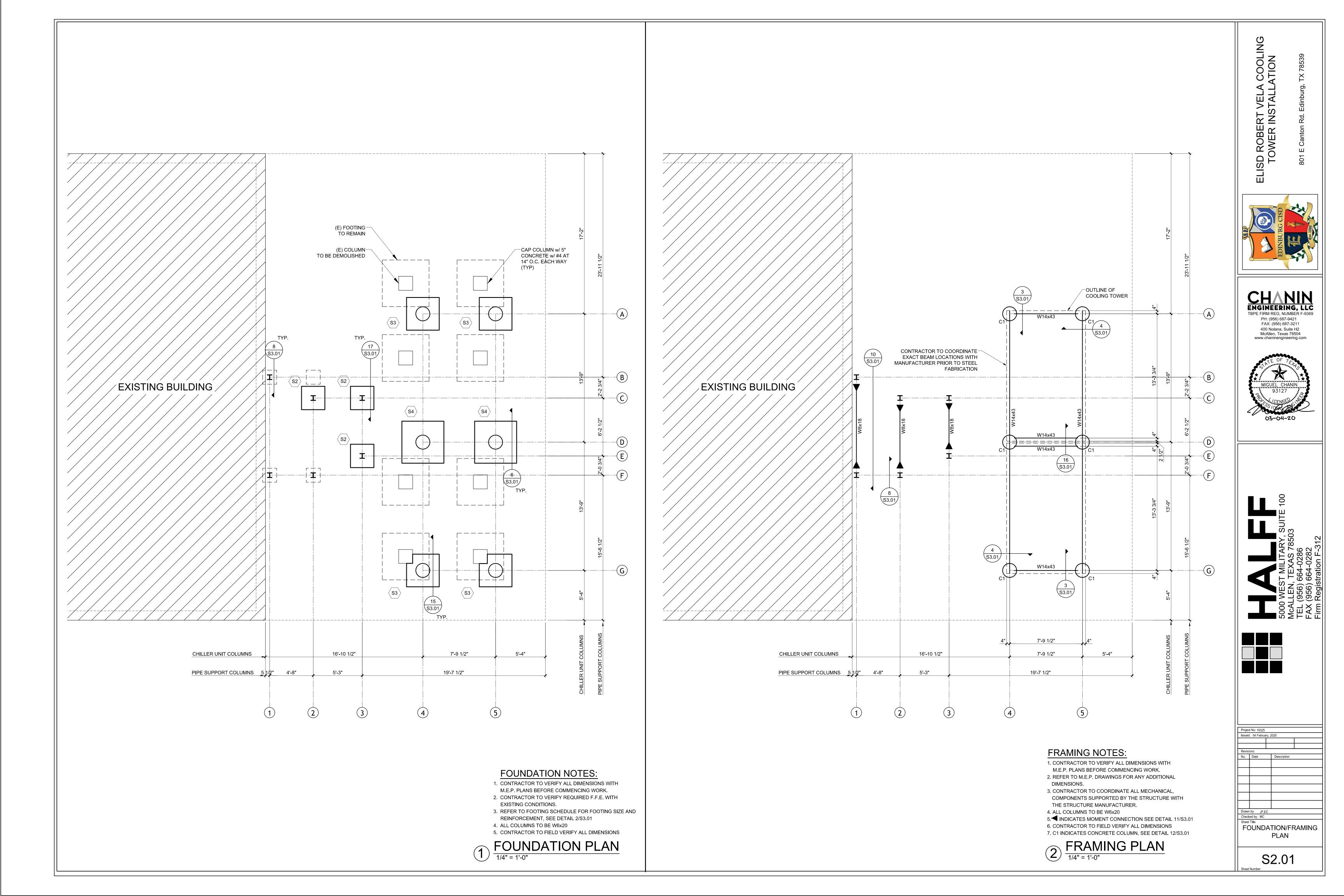
CHANIN ENGINEERING, LLC TBPE FIRM REG. NUMBER F-9369 PH: (956) 687-9421 FAX: (956) 687-3211 400 Nolana, Suite H2 McAllen, Texas 78504 www.chaninengineering.com

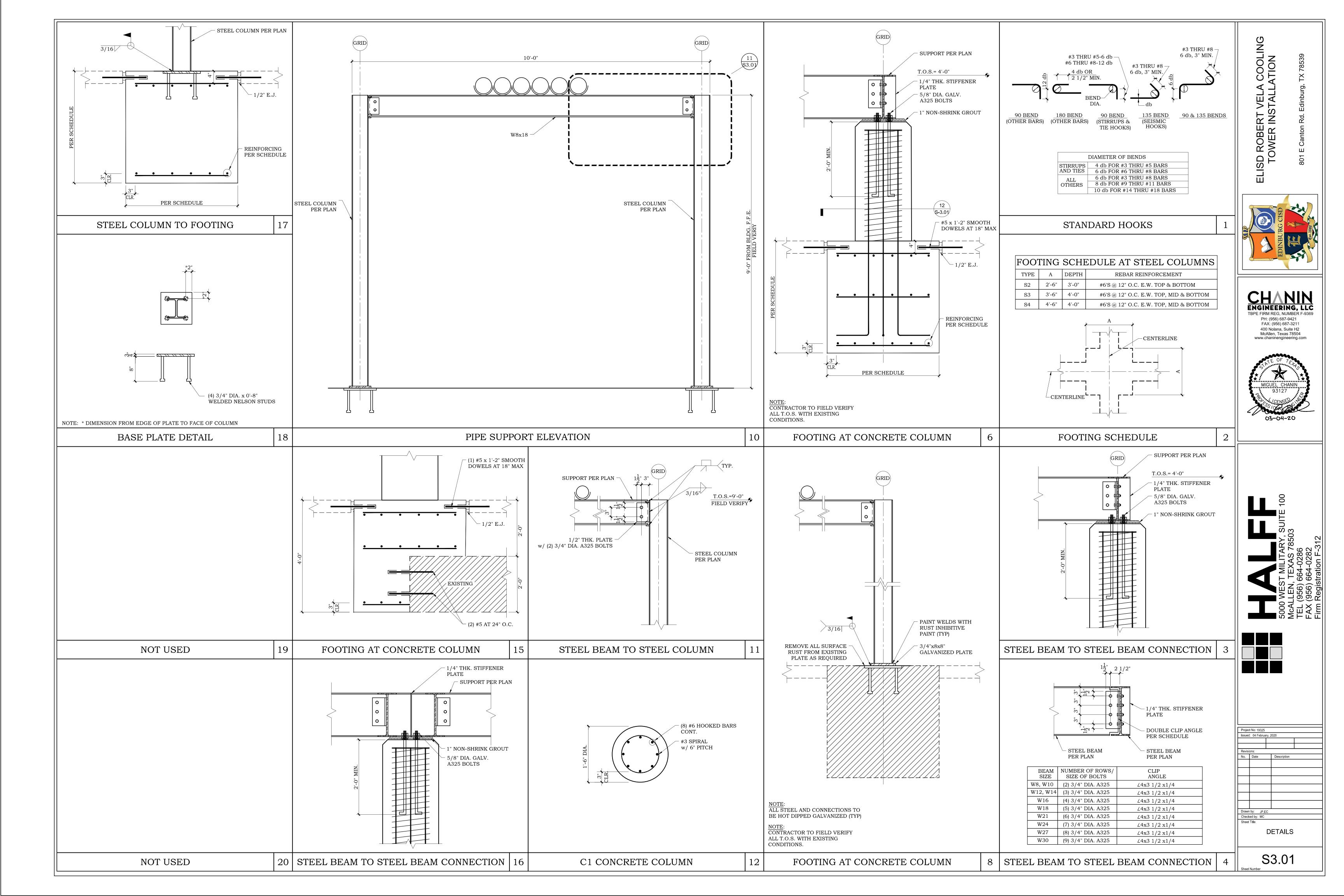




Projec	t No: 19325			
Issued	d: 04 Februa	ary, 2	020	
Revis	ions:			
No.	Date		Description	
Drawr	by: JP,E	С		
Check	ked by: MC			
Sheet	: Tit l e			

GENERAL NOTES





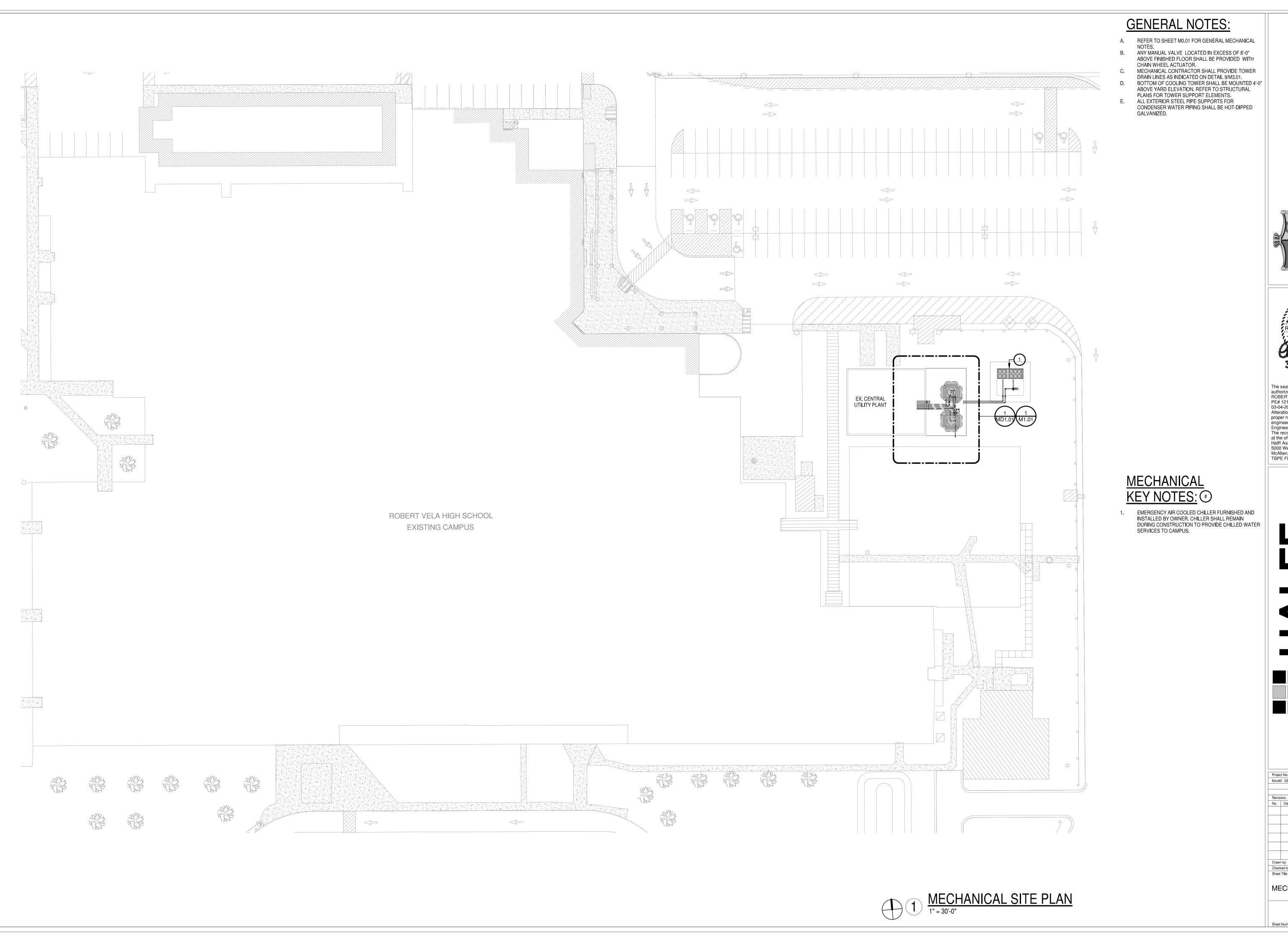
The seal appearing on this document was authorized by:
ROBERTO H. TIJERINA
PE# 121946
03-04-2020
Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act.
The record copy of this drawing is on file at the offices of:
Halff Associates
5000 West Military Highway, Suite100
McAllen, Texas 78503-7446
TBPE FIRM #F-312

MECHANICAL GENERAL LEGEND

M0.01

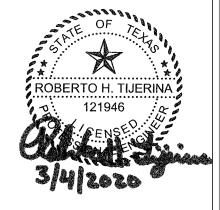
MECHANICAL GENERAL LEGEND

DUCTWO	ORK SYMBOLS	PIPING SYMBOLS	MISCELLANEOUS SYMBOLS	GENERAL ABBREVIATIONS	GENERAL MECHANICAL NOTES
DESCRIPTION BACKDRAFT DAMPER	SYMBOL BDD BDD				
BALANCING/VOLUME DAMPER		SYMBOL DESCRIPTION	X' - X" CUT PLANE	ABV ABOVE AAV ALITOMATIC AIR VALVE MAX MAXIMUM	INFORMATION ON THIS PLAN HAS BEEN OBTAINED FROM EXISTING DRAWINGS
OPPOSED BLADE DAMPER		CONDENSOR WATER RETURN CONDENSOR WATER SUPPLY CONDENSOR WATER RETURN	DUCT STATIC PRESSURE SENSOR	AFF ABOVE FINISHED FLOOR AFMS AIR FLOW MEASURING STATION MFR MANUFACTURER MIN MINIMUM	AND SITE SURVEY. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES BETWEEN EXISTING
SMOKE DAMPER	RECTANGULAR ROUND ROUND		DUCT SMOKE DETECTOR	AMB AMBIENT MVD MOTORIZED VOLUME DAMPER APD AIR PRESSURE DROP MW MAKE UP WATER	CONDITIONS AND CONSTRUCTION DOCUMENTS SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER AND/OR ARCHITECT. THIS PROJECT IS INTENDED FOR LEED CERTIFICATION UNDER THE USGBC RATING SYSTEM.
		PCWS—PCWS—PRIMARY CHILLED WATER SUPPLY PCWR—PCWR—SCWS—SECONDARY CHILLED WATER SUPPLY	CO2 CARBON DIOXIDE SENSOR POINT OF NEW CONNECTION TO EXISTING	BD BLOWDOWN BDD BACK DRAFT DAMPER NC NORMALLY CLOSED	THESE DOCUMENTS AND THE SYSTEMS IDENTIFIED HEREIN ARE CREATED AND SELECTED TO ADHERE TO LEED REQUIREMENTS. DEVIATION FROM THESE SYSTEMS BY THE CONTRACTOR WILL REQUIRE THE CONTRACTOR TO
FIRE DAMPER	RECTANGULAR ROUND ROUND	SECONDARY CHILLED WATER SETURN DRAIN		BF BLIND FLANGE NK NECK BFP BACKFLOW PREVENTER NO NORMALLY OPEN OR NUMBER BFV BUTTERFLY VALVE NTS NOT TO SCALE	ENSURE THAT THE MODIFIED SYSTEM IS COMPLIANT WITH HE RATING SYSTEM. ANY WORK THAT IS NOT COMPLIANT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S COST.
FIRE/SMOKE DAMPER	RECTANGULAR ROUND ROUND	DIRECTION OF PITCH (DOWN) FLUID FLOW DIRECTION	H HUMIDISTAT RH RELATIVE HUMIDITY SENSOR	BHP BRAKE HORSEPOWER BLV BALANCING VALVE BLW BELOW OA OUTSIDE AIR	2. THE CONTRACTOR IS FULLY RESPONSIBLE FOR PERFORMING THE WORK IN FULL COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES UNDER THIS SECTION OF THE CONTRACT. IF THE CONTRACTOR
FLEXIBLE CONNECTION		SECTIONAL VALVE (SEE SPECS) GATE VALVE	AVG T AVERAGING THERMOSTAT OR TEMPERATURE SENSOR (MOUNT 48" A	BOD BOTTOM OF DUCT OBD OPPOSED BLADE DAMPER AFF) BOP BOTTOM OF PIPE	DETERMINES THAT THE CONTRACT DOCUMENTS AND PLANS ARE NOT IN COMPLIANCE WITH THE APPLICABLE LOCAL CODES, HE SHALL INFORM THE ARCHITECT PRIOR TO CONSTRUCTION START FOR DIRECTION. FAILURE TO
		CHECK VALVE THROTTLING VALVE (SEE SPECS) GLOBE VALVE	THERMOSTAT OR TEMPERATURE SENSOR (MOUNT 48" AFF)	BOS BOTTOM OF STEEL BV BALL VALVE	DO SO SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO MEET APPLICABLE LOCAL CODES, AND REWORK SHALL BE AT CONTRACTOR'S
MOTORIZED DAMPER	[M] [M]	BUTTERFLY VALVE	T DUCT TEMPERATURE SENSOR	CAP CAPACITY PD PRESSURE DROP CCMS CENTRAL CONTROL MONITORING SYSTEM PH PHASE CENT CENTRIFUGAL PI PRESSURE INDICATOR	EXPENSE. 3. ALL OPENINGS CUT IN MASONRY AND PLASTER WALLS OR CONCRETE FLOORS SHALL BE CORE DRILLED OR SAWED WHEN POSSIBLE. CONTRACTOR
CONTROL DAMPER	[CD] [CD]	CALIBRATED BALANCING VALVE BALL VALVE	TC TIME CLOCK FREEZESTAT	CMBST COMBUSTION AIR PRV PRESSURE RELIEF VAVLE PS PRESSURE SENSOR	SHALL CHECK BUILDING CONSTRUCTION BEFORE MAKING PENETRATIONS TO AVOID CUTTING THROUGH STRUCTURAL BEAMS AND REINFORCING. CONTRACTOR SHALL INFORM THE ENGINEER IF REINFORCING IS CUT OR
DUCT ELBOW WITH TURNING VANES	The state of the s	PRESSURE REDUCING VALVE	DIFFUSER, GRILLE OR REGISTER MARK	CV CONTROL VALVE OR CONSTANT VOLUME PTRV PRESSURE SAFETY VALVE CHWS CHILLED WATER SUPPLY PV PLUG VALVE	DAMAGED WHILE MAKING OPENINGS. CONTRACTOR SHALL REINFORCE ALL OPENINGS AS REQUIRED BY DRAWINGS AND SPECIFICATIONS. PATCH AND SEAL OPENINGS WITH 6000 PSI CEMENT GROUT. INSTALL DECORATIVE TRIM
		PRESSURE RELIEF OR SAFETY VALVE	A AIR FLOW (CFM) 200 CFM	CHWR CHILLED WATER RETURN PCW PRIMARY CHILLED WATER PCWS PRIMARY CHILLED WATER SUPPLY	(EQUIPMENT FLANGES, FRAMING OR ESCUTCHEONS) AROUND OPENINGS IN FINISHED AREAS. COORDINATE ALL CUTTING AND PATCHING WITH THE OTHER TRADES.
DUCT SECTION - SUPPLY AIR		VACUUM RELIEF OR SAFETY VALVE ANGLE VALVE	12 X 8 ———RECTANGULAR FACE SIZE (WHERE APPLICABLE)	D DIFFUSER OR DAMPER PCWP PRIMARY CHILLED WATER RETURN PCWP PRIMARY CHILLED WATER PUMP	4. ON ANY WORK SHOWN ON MECHANICAL DRAWINGS REQUIRING DEMOLITION OF EXISTING OR NEW BUILDING STRUCTURES AND FINISHES, IT SHALL BE THE
DUCT SECTION - EXHAUST AIR		[S] SOLENOID VALVE	DIRECTION OF SECTION 101 IDENTIFYING NUMBER OR LETTER FOR SECTIONS.	DEG DEGREES RA RETURN AIR (RTN) DIA DIAMETER RE: REFER TO DN DOWN RED REDUCER	RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE THE NECESSARY DEMOLITION. CONTRACTOR SHALL PATCH AND REPAIR ALL DEMOLITION WORK. PATCHING SHALL BE COMPLETED WITH THE SAME MATERIALS AS THE
DUCT SECTION - RETURN, OUTSIDE, OR RELIEF AIR		[M] 2-WAY MOTOR OPERATED CONTROL VALVE	IDENTIFYING NUMBER OR LETTER FOR SECTIONS. NUMBER OF REFERENCE DRAWING WHERE SECTION IS SHOWN.	DX DIRECT EXPANSION REG REGISTER RH RELATIVE HUMIDITY	SURROUNDING AREAS, OR WITH ARCHITECT-APPROVED PATCHING MATERIALS. REPAIRS SHALL BE COMPLETED ACCORDING TO ARCHITECTURAL SPECIFICATIONS. ALL REFINISHING SHALL BE APPROVED BY
DUCT, INCLINED DROP		3-WAY MOTOR OPERATED CONTROL VALVE	IDENTIFYING NUMBER OR LETTER FOR DETAILS.	RPM REVOLUTIONS PER MINUTE EAT ENTERING AIR TEMPERATURE EDB ENTERING DRYBULB TEMPERATURE SA SUPPLY AIR OF NO. 10 OF NO. 11 OF NO. 12 O	THE ARCHITECT. 5. ALL PIPING SHALL BE INSULATED AND JACKETED. REFER TO THE SPECIFICATIONS. CONDENSER COILS ARE TO BE COATED IN ACCORDANCE
DUCT, INCLINED RISE		2-WAY CONTROL VALVE	ENLARGED DETAIL REFERENCE NUMBER OF REFERENCE DRAWING WHERE DETAIL IS SHOWN.	EFF EFFICIENCY SL SOUND LINING ENT ENTERING SD SMOKE DETECTOR	WITH THE SPECIFICATIONS. 6. VERIFY THE LOCATION OF ALL WALLS, PARTITIONS, DOORS, CABINETS, AND CEILINGS FROM ACTUAL FIELD MEASUREMENTS.
FLEXIBLE DUCT - ROUND	8"ø	3-WAY CONTROL VALVE	MATCHURIE A	ESP EXTERNAL STATIC PRESSURE SOV SOLENOID OPERATED VALVE OR SHUT- EWB ENTERING WET BULB OFF VALVE	
DUCT TRANSITION	14"/10"	TRIPLE DUTY VALVE	MATCHLINE B MATCHLINE	FCV FLOW CONTROL VALVE SCW SECONDARY CHILLED WATER	
DUCT TRANSITION	12"/12" - 8"ø	FLOW CONTROL VALVE PLUG VALVE	BOLD DASHED LINE DESIGNATES DEMOLITION WORK	FLA FULL LOAD AMP SCWS SECONDARY CHILLED WATER SUPPLY FLEX FLEXIBLE SCWR SECONDARY CHILLED WATER RETURN FM FLOW METER SCWP SECONDARY CHILLED WATER PUMP	
(SQUARE OR RECTANGULAR TO ROUND)	12/12	—————————————————————————————————————	AIRFLOW DIAGRAM SYMBOLS	FRM FROM FWL FIXED WALL LOUVER TOD TOP OF DUCT	
RECTANGULAR DUCT, SIZE IN INCHES, FIRST DIMENSION IS SIDE SHOWN	10"/14"	PLUGGED TEE	M	GR GRILLE TOS TOP OF PIPE GV GATE VALVE TS TEMPERATURE SENSOR	
(NET CLEAR INSIDE DIMENSION)		FLOW METER		HZ CYCLES PER SECOND (HERTZ) TSTAT THERMOSTAT TSP TOTAL STATIC PRESSURE UNO UNLESS NOTED OTHERWISE	
ROUND DUCT, DIAMETER IN INCHES (NET CLEAR INSIDE DIMENSION)	8"ø	PRESSURE GAUGE WITH VENT COCK	COOLING COIL MOTORIZED OPPOSED BLADE DAMPER	kW KILOWATT VEL VELOCITY VTR VENT THROUGH ROOF	
AIR FLOW IN DIRECTION OF ARROW		THERMOMETER		LAT LEAVING AIR TEMPERATURE WB WET BULB	
45° BRANCH TAKE-OFFS	↓	THERMAL WELL WITH TEMPERATURE SENSOR STRAINER	HEATING COIL	LDB LEAVING DRYBULB TEMPERATURE WPD WATER PRESSURE DROP WTR WATER LWT LEAVING WATER TEMPERATURE WxhxL WIDTH BY HEIGHT BY LENGTH	
		STRAINER WITH BLOWDOWN VALVE	MOTORIZED PARALLEL BLADE DAMPER		
CONICAL LATERAL BRANCH TAKE-OFFS		CONCENTRIC REDUCER ECCENTRIC REDUCER		EQUIPMENT ABBREVIATIONS	
CEILING SUPPLY DIFFUSERS		ECCENTRIC REDUCER UNION	LOUVER FAN STARTER	ABV ABOVE FCCU FAN COIL CONDENSING UNIT AHU AIR HANDLING UNIT FPB FAN POWER BOX	
CEILING RETURN GRILLE/REGISTER		FLEXIBLE PIPE CONNECTOR		ACU AIR CONDENSING UNIT GFUH GAS FIRED UNIT HEATER ACCU AIR COOLED CONDENSING UNIT HC HOT WATER HEATING COIL	
CEILING EXHAUST FAN (EF)		CAPPED PIPE/OUTLET PLUGGED PIPE/OUTLET	BDD FAN	AS AIR SEPARATOR HPU HEAT PUMP UNIT B BOILER HWP HOT WATER PUMP BCU BLOWER COIL UNIT OAH OUTSIDE AIR HOOD	
		AUTOMATIC AIR VENT	BACKDRAFT DAMPER	CC COOLING COIL KEF KITCHEN EXHAUST FAN CF CHEMICAL FEEDER KSF KITCHEN SUPPLY FAN	
SIDEWALL SUPPLY GRILLE/REGISTER		VALVE AND BLIND FLANGE	FD/SD FAN WITH ADJUSTABLE FREQUENCY	CH CHILLER L LOUVER CP CONDENSOR PUMP LEF LAB EXHAUST FAN	
		PIPE HEADER WITH BLIND FLANGE	MOTOR CONTROLLER FIRE/SMOKE DAMPER	CT COOLING TOWER MZK MULTI-ZONE KIT CWP CHILLED WATER PUMP P PUMP	
SIDEWALL RETURN/EXHAUST		PIPE TURNING UPPIPE TURNING DOWN		EDH ELECTRIC DUCT HEATER DC DUST COLLECTOR PP PRIMARY PUMP POAC PERICATER OUTSIDE AIR SYSTEM	
GRILLE/REGISTER		PIPE BRANCH BOTTOM CONNECTION		DOAS DEDICATED OUTSIDE AIR SYSTEM EF EXHAUST FAN EH ELECTRIC HEATER DOAS DEDICATED OUTSIDE AIR SYSTEM PTAC PACKAGE TERMINAL AIR CONDITIONING RH RELIEF HOOD RH RELIEF HOOD	
EXTRACTOR		PIPE BRANCH TOP CONNECTION	AIR FLOW MEASURING STATION	ET EXPANSION TANK RHEF RELIEF HOOD EXHAUST FAN RTU ROOF TOP UNIT	
		PUMP (FOR WATER FLOW DIAGRAM ONLY)	TOTALION STATES	FB FILTER BOX SDB SINGLE DUCT BOX FCU FAN COIL UNIT SF SUPPLY FAN CR. SECONDARY BLAND	
DUCT TEE WITH SPLITTER DAMPER	C XX			SP SECONDARY PUMP SRF SMOKE REMOVAL FAN	
DOOR UNDERCUT	—UC— -			ST CHILLED WATER STORAGE TANK UH UNIT HEATER	
DOOR LOUVER	—L— -			VAV VARIABLE AIR VOLUME BOX VFD VARIABLE FREQUENCY DRIVE	
				VRV VARIABLE REFRIGERANT VOLUME	



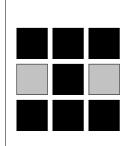
ECISD ROBERT VELA COOLING TOWER INSTALLATION





The seal appearing on this document was authorized by:
ROBERTO H. TIJERINA
PE# 121946
03-04-2020
Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act.
The record copy of this drawing is on file at the offices of:
Halff Associates
5000 West Military Highway, Suite100
McAllen, Texas 78503-7446
TBPE FIRM #F-312

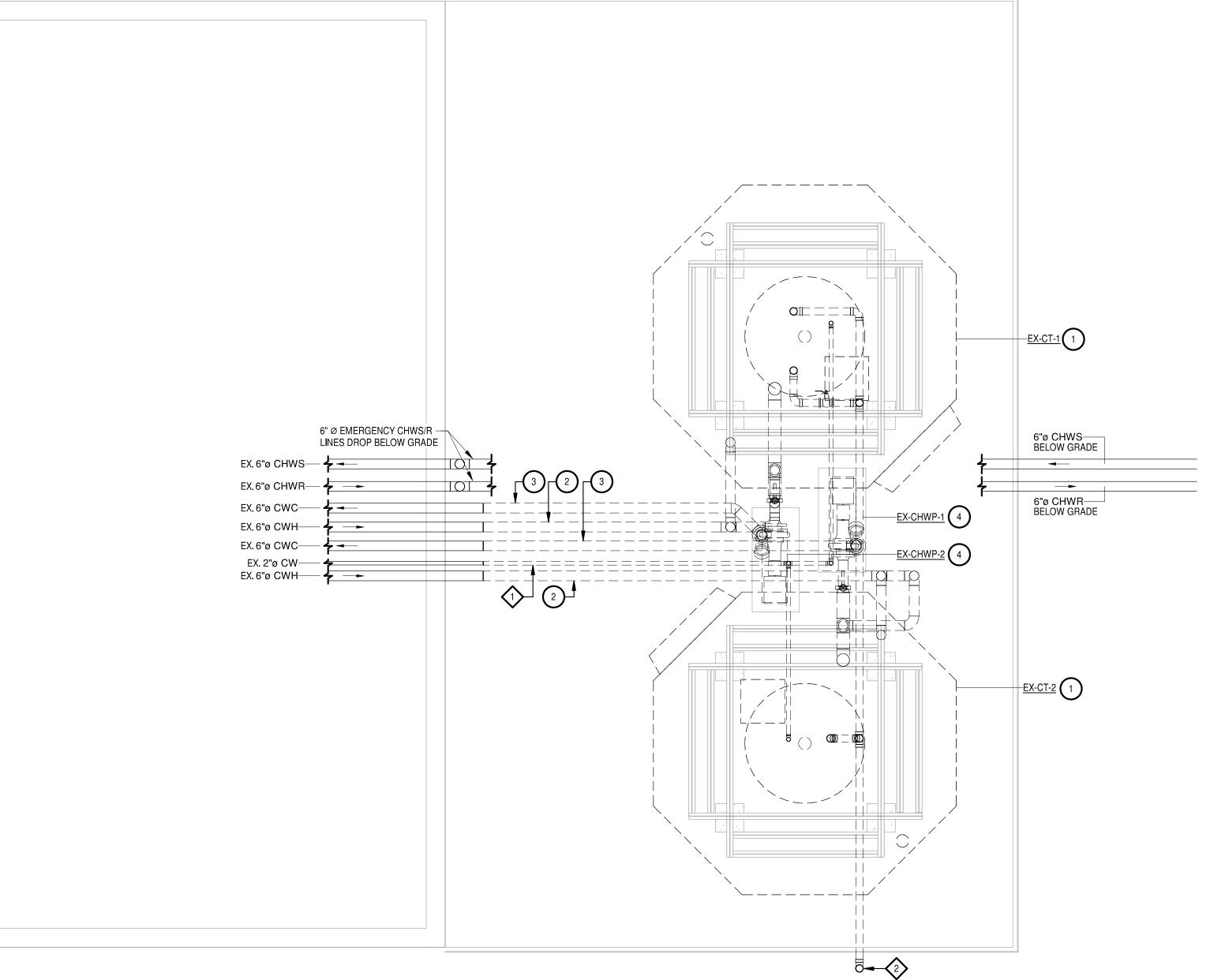
5000 WEST MILITARY, SUITE 100 McALLEN, TEXAS 78503 TEL (956) 664-0286 FAX (956) 664-0282



Projec	ct No: 37841	იი	1	
	d: 02/26/20		'	
Revis	ions:			
No.	Date		Description	
Drawr	by: JB			
Check	ked by: RT			
Sheet	Title			
	-01141			

MECHANICAL SITE PLAN

MS1.00



MECHANICAL/ PLUMBING DEMOLITION
PLAN - CHILLER YARD

1/4" = 1'-0"

<u>GENERAL</u> DEMOLITIONNOT

- A. INFORMATION ON THE PLAN HAS BEEN OBTAINED FROM EXISTING DRAWINGS AND SITE SURVEY. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND CONSTRUCTION DOCUMENTS SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER AND/OR ARCHITECT.
- THE ENGINEER AND/OR ARCHITECT. THE CONTRACTOR IS FULLY RESPONSIBLE FOR PERFORMING THE DEMOLITION WORK UNDER THIS SECTION OF THE PROJECT IN FULL COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES. IF THE CONTRACTOR DETERMINES THAT THE CONTRACT DOCUMENTS AND PLANS ARE NOT IN COMPLIANCE WITH THE APPLICABLE CODES, HE SHALL INFORM THE ARCHITECT PRIOR TO CONSTRUCTION START FOR DIRECTION. FAILURE TO DO SO SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO MEET CODE REQUIREMENTS AND REWORK SHALL BE AT CONTRACTOR'S EXPENSE. APPLICABLE CODES AND STANDARDS ON DEMOLITION WORK SHALL INCLUDE THOSE PUBLISHED BY OSHA AND EPA. AN ASBESTOS SURVEY SHALL BE KEPT ON SITE AT ALL TIMES PER TEXAS DEPARTMENT OF HEALTH REQUIREMENTS.
- TEXAS DEPARTMENT OF HEALTH REQUIREMENTS.

 C. ALL DUST PRODUCTION, SMOKE PRODUCTION AND NOISE SHALL BE SUBJECT TO REAL TIME REVIEW BY THE ARCHITECT. WORK SHALL BE SHUT DOWN DURING CRITICAL ACTIVITIES BY FORMAL REQUEST FROM THE DESIGNATED AUTHORITY OR CONTRACTING ARCHITECT. WORK IN DUSTY AREAS SHALL BE CONTROLLED WITH TEMPORARY PARTIONS. FLAME CUTTING SHALL BE MINIMIZED TO ELIMINATE SMOKE PRODUCTION. PROVIDE FIRE EXTINGUISHERS IN THE IMMEDIATE AREA.
- D. GENERAL CONTRACTOR SHALL BE ADVISED OF ALL NEW PROPOSED ROOF OPENINGS BY ANY SUB-
- E. ON ANY WORK SHOWN ON MECHANICAL DRAWINGS
 WHICH REQUIRES DEMOLITION OF BUILDING
 STRUCTURES AND FINISHES, IT SHALL BE THE
 RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE
 THE NECESSARY DEMOLITION. CONTRACTOR SHALL
 PATCH AND REPAIR ALL BUILDING DAMAGE CREATED
 BY DEMOLITION WORK. PATCHING SHALL BE
 COMPLETED WITH THE SAME MATERIALS AS THE
 SURROUNDING AREAS, OR WITH ARCHITECT
 APPROVED PATCHING MATERIALS.
- APPROVED PATCHING MATERIALS.

 F. ALL OPENINGS CUT IN MASONRY AND PLASTER WALLS OR CONCRETE FLOORS SHALL BE CORE-DRILLED OR SAWED WHEN POSSIBLE. CONTRACTOR SHALL CHECK BUILDING CONSTRUCTION WITH STRUCTURAL ENGINEER BEFORE MAKING PENETRATIONS TO AVOID CUTTING THROUGH STRUCTURAL BEAMS AND REINFORCING. CONTRACTOR SHALL INFORM THE ENGINEER IF REINFORCING IS CUT OR DAMAGED WHILE MAKING OPENINGS AS REQUIRED BY DRAWINGS AND SPECIFICATIONS. PATCH AND SEAL OPENINGS WITH 8000 PSI CEMENT GROUT. INSTALL DECORATIVE TRIM (EQUIPMENT FLANGES, FRAMING, OR ESCUTCHEONS) AROUND OPENINGS IN FINISHED AREAS. COORDINATE ALL CUTTING AND PATCHING WITH THE OTHER TRADES.
- G. ALL SURFACES COVERED BY "SPRAY POLY" AND PROTECTED BY TEMPORARY PARTITIONS SHALL REMAIN PROTECTED THROUGHOUT THE PROJECT. REMOVE THE PROTECTIVE BARRIERS ONLY AFTER THE NEW EQUIPMENT PIPING AND DUCTWORK IS INSTALLED. PATCH AND MAINTAIN THE PROTECTIVE BARRIERS DURING CONSTRUCTION. COVER ALL EQUIPMENT OPENINGS WITH 4 MIL. POLY AND DUCT TAPE IN PLACE.
- H. ALL NEW ROOF PENETRATIONS SHALL BE ROUTED THRU ANY EXISTING OPENING WHEREVER POSSIBLE. LARGER AND NEW OPENINGS SHALL BE KEPT TO A MINIMUM.
- I. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL UNDERGROUND UTILITIES IN AREAS OF EXCAVATION WORK.
- J. CONTRACTOR SHALL REMOVE AND RETURN ANY AND ALL EXISTING EQUIPMENT/MATERIALS TO OWNER.

 OWNER SHALL HAVE FULL RIGHT OF OWNERSHIP UNLESS SPECIFIED OTHERWISE. IF THE OWNER WAIVES THIS OPTION, ANY EQUIPMENT, MATERIAL, ETC SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

 K. CONTRACTOR SHALL KEEP THE ENTIRE MEP
- DEMOLITION SITE CLEAN AT ALL TIMES.

 L. CONTRACTOR AND OWNER SHALL BE FULLY
 RESPONSIBLE TO IDENTIFY ANY AND ALL ASBESTOS
 PRESENT IN THE BUILDING PRIOR TO DEMOLITION AS
- REQUIRED BY LAW.

 M. COORDINATION AMONG OTHER CONSTRUCTION
 DISCIPLINES PRIOR TO DEMOLITION IS MANDATORY.
 CONTRACTOR SHALL IDENTIFY ALL WATER
- DISCIPLINES PRIOR TO DEMOLITION IS MANDATOR CONTRACTOR SHALL IDENTIFY ALL WATER CONNECTION LINES, NATURAL GAS LINES AND SANITARY SEWER LINES PRIOR TO COMMENCING DEMOLITION WORK.

LINETYPE LEGEND

EXISTING TO BE DEMOLISHED

EXSITING TO REMAIN

MECHANICAL KEY NOTES: (

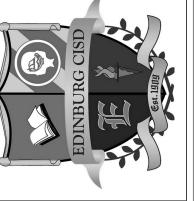
- 1. CONTRACTOR SHALL REMOVE EXISTING COOLING TOWER WITH ASSOCIATED STRUCTURE AND PROVIDE TEMPORARY PIPE SUPPORT AS REQUIRED. REFER TO STRUCTURAL DRAWINGS FOR EXTENT OF DEMOLITION WORK.
- 2. CONTRACTOR SHALL REMOVE EXISTING CONDENSER WATER HOT PIPES INCLUSIVE OF MAINS, BRANCHES, RISERS, VALVES, ACCESSORIES, ETC. FROM COOLING TOWER BACK TO INDICATED LOCATION.
- 3. CONTRACTOR SHALL REMOVE EXISTING CONDENSER WATER COLD PIPES INCLUSIVE OF MAINS, BRANCHES, RISERS, VALVES, ACCESSORIES, ETC. FROM COOLING TOWER BACK TO INDICATED LOCATION.
- CONTRACTOR SHALL REMOVE EXISTING CONDENSER WATER PUMP AND ASSOCIATED HOUSE KEEPING PAD.

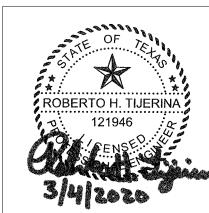
<u>PLUMBING</u> KEY NOTES: <

- 1. DEMOLISH EXISTING 2" MAKE-UP WATER LINE SERVING EXISTING COOLING TOWERS AS SHOWN ON PLANS.
 COORDINATE WITH NEW WORK REQUIREMENTS.
 - DEMOLISH EXISTING SANITARY SEWER AND OVERFLOW DRAIN PIPES SERVING EXISTING COOLING TOWERS AS INDICATED ON PLANS. COORDINATE WITH NEW WORK REQUIREMENTS.

VELA COOLIN TALLATION

TOWER INSTALLATION





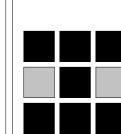
The seal appearing on this document was authorized by:
ROBERTO H. TIJERINA

PE# 121946
03-04-2020
Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act.
The record copy of this drawing is on file at the offices of:
Halff Associates

5000 West Military Highway, Suite100 McAllen, Texas 78503-7446 TBPE FIRM #F-312

TBPE FIRM #F-312

5000 WEST MILITARY, SUITE 100 McALLEN, TEXAS 78503 TEL (956) 664-0286 FAX (956) 664-0286



	ct No: 37841 d: 02/26/20		
	u. 02/20/20		
Revis	ions:		
No.	Date	Description	
Drawı	by: JB		
	ked by: RT		
· ·			

PLUMBING DEMOLITION PLAN

MECHANICAL/

MD1.01

MECHANICAL/ PLUMBING PLAN CHILLER YARD 1/4" = 1'-0"

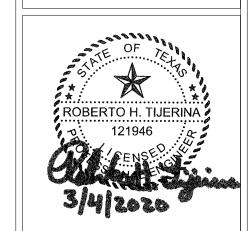
GENERAL NOTES:

- A. REFER TO SHEET M0.01 FOR GENERAL MECHANICAL NOTES.
- B. ANY MANUAL VALVE LOCATED IN EXCESS OF 8'-0"
 ABOVE FINISHED FLOOR SHALL BE PROVIDED WITH
 - CHAIN WHEEL ACTUATOR.

 MECHANICAL CONTRACTOR SHALL PROVIDE TOWER
 DRAIN LINES AS INDICATED ON DETAIL 9/M3.01.
- D. BOTTOM OF COOLING TOWER SHALL BE MOUNTED 4'-0"
 ABOVE YARD ELEVATION. REFER TO STRUCTURAL
 PLANS FOR TOWER SUPPORT ELEMENTS.
- E. ALL EXTERIOR STEEL PIPE SUPPORTS FOR CONDENSER WATER PIPING SHALL BE HOT-DIPPED GALVANIZED.







The seal appearing on this document was authorized by:
ROBERTO H. TIJERINA

PE# 121946
03-04-2020
Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act.
The record copy of this drawing is on file at the offices of:

Halff Associates
5000 West Military Highway, Suite100
McAllen, Texas 78503-7446
TBPE FIRM #F-312

MECHANICAL KEY NOTES:

NEW PIPING/EQUIPMENT

SANITARY WASTE LINE

DOMENSTIC COLD WATER

VENT LINE

NEW UNDERGROUND PIPING

EXISTING PIPING/EQUIPMENT

EXISTING UNDERGROUND PIPING

1. CONNECT NEW 6" CONDENSER WATER COLD (CWC)
PIPE TO EXISTING CONDENSER WATER COLD PIPE
ABOVE GRADE AS INDICATED. FIELD VERIFY SIZE,
LOCATION, AND ELEVATION. WELD STEEL FLANGE TO
EXISTING PIPE FOR NEW PVC CONNECTION. USE
SOLVENT -WELD SCHEDULE - 80 SOCKET FITTING FOR
CONNECTION.

LINETYPE LEGEND

- CONNECT NEW 6" CONDENSER WATER HOT (CWH)
 PIPE TO EXISTING 6" CONDENSER WATER HOT PIPE
 ABOVE GRADE AS INDICATED. FIELD VERIFY SIZE,
 LOCATION, AND ELEVATION. WELD STEEL FLANGE TO
 EXISTING PIPE FOR NEW PVC CONNECTION. USE
 SOLVENT-WELD SCHEDULE 80 SOCKET FITTINGS FOR
 CONNECTION.
- 3. NEW 8" COOLING TOWER EQUALIZER LINE.
- 4. NEW MANUAL ISOLATION VALVE.
- 5. PROVIDE NEW MOTORIZED CONTROL VALVE EQUAL TO BRAY SERIES 70. MOTORIZED CONTROL VALVE SHALL BE LOCATED TOWER SIDE OF MANUAL SHUT-OFF VALVE. INSTALL NEW VALVES BELOW 8' A.F.F.
- 6. FURNISH AND INSTALL 0'-4" HIGH CONCRETE HOUSE KEEPING PAD FOR PUMP. PAD SHALL EXTEND 6" BEYOND EVERY PUMP EDGE.
- 7. UNDER ALTERNATE #1, CONTRACTOR SHALL
 DEMOLISH EXISTING VFD AND PROVIDE NEW VFD FOR
 COOLING TOWER. VFD SHALL BE PROVIDED BY
 MECHANICAL CONTRACTOR AND WIRED BY
 ELECTRICAL CONTRACTOR.
- 8. VFD SHALL BE PROVIDED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL
- CONTRACTOR.

 9. PROVIDE NEW 3-WAY MOTORIZED CONTROL
 CONDENSER WATER BY-PASS VALVE.

 10. PROVIDE NEW COOLING TOWER MAKE-LIP WA
- 10. PROVIDE NEW COOLING TOWER MAKE-UP WATER SUB METER. SUB METER SHALL BE MONITORED BY THE SYSTEM BUILDING AUTOMATION SYSTEM.

<u>PLUMBING</u> <u>KEY NOTES:</u> ◆

- CONNECT NEW 2" MAKE-UP WATER LINE TO COOLING TOWER. INSULATE AND JACKET WATER LINE IN ACCORDANCE WITH SPECIFICATIONS.
- 2. DRAIN COOLING TOWER INTO HUB DRAIN. REFER TO
- DETAIL 9/M3.01
 3. EXPOSED VENT LINES SHALL BE PVC SCHEDULE 40. 10'
 HIGH MINIMUM FROM FINISH FLOOR. SECURE TO
 COOLING TOWER.

Revisions:

No. Date Description

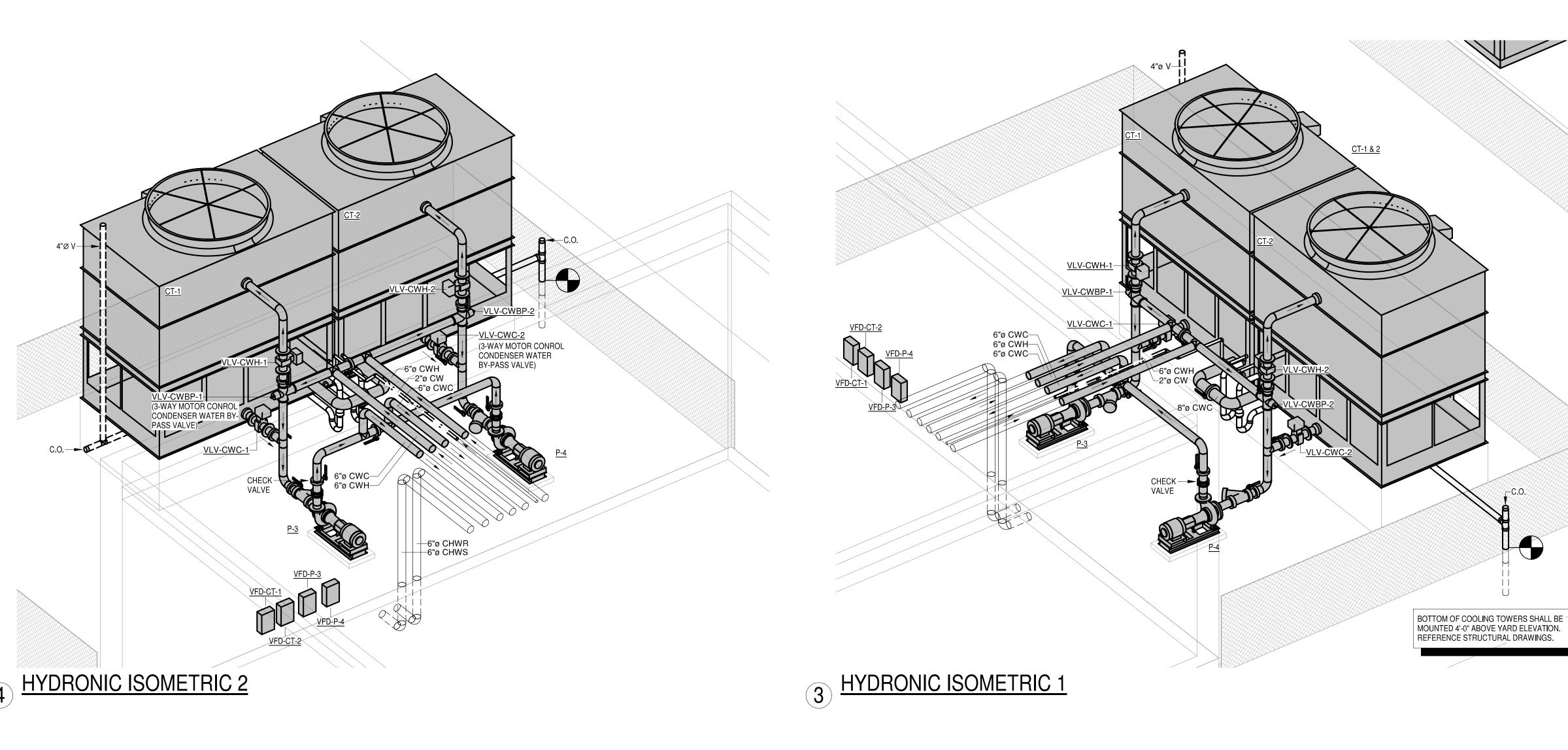
Drawn by: JB
Checked by: RT
Sheet Title

MECHANICAL/

Issued: 02/26/20

PLUMBING PLAN

M1.01



___4"Ø VENT

GENERAL NOTES:

- REFER TO SHEET M0.01 FOR GENERAL MECHANICAL
- NOTES. ANY MANUAL VALVE LOCATED IN EXCESS OF 8'-0"
 ABOVE FINISHED FLOOR SHALL BE PROVIDED WITH
 CHAIN WHEEL ACTUATOR.
- MECHANICAL CONTRACTOR SHALL PROVIDE TOWER DRAIN LINES AS INDICATED ON DETAIL 9/M3.01. BOTTOM OF COOLING TOWER SHALL BE MOUNTED 4'-0" ABOVE YARD ELEVATION. REFER TO STRUCTURAL
- PLANS FOR TOWER SUPPORT ELEMENTS. ALL EXTERIOR STEEL PIPE SUPPORTS FOR CONDENSER WATER PIPING SHALL BE HOT-DIPPED GALVANIZED.

LINETYPE LEGEND

NEW PIPING/EQUIPMENT

SANITARY WASTE LINE

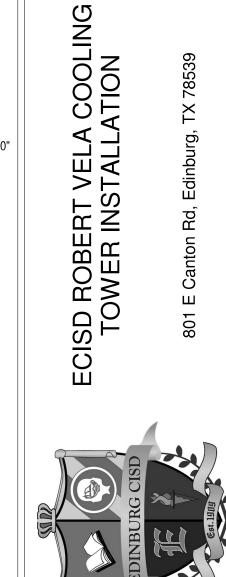
DOMENSTIC COLD WATER

VENT LINE

NEW UNDERGROUND PIPING

EXISTING PIPING/EQUIPMENT

EXISTING UNDERGROUND PIPING





he seal appearing on this document was authorized by: ROBERTO H. TIJERINA

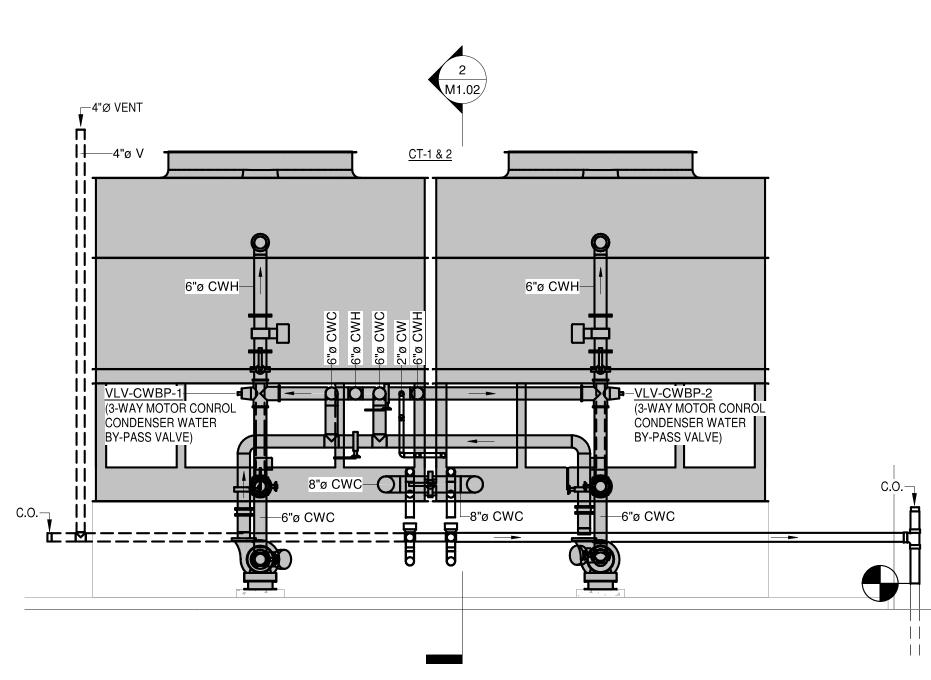
PE# 121946 03-04-2020 Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act. The record copy of this drawing is on file

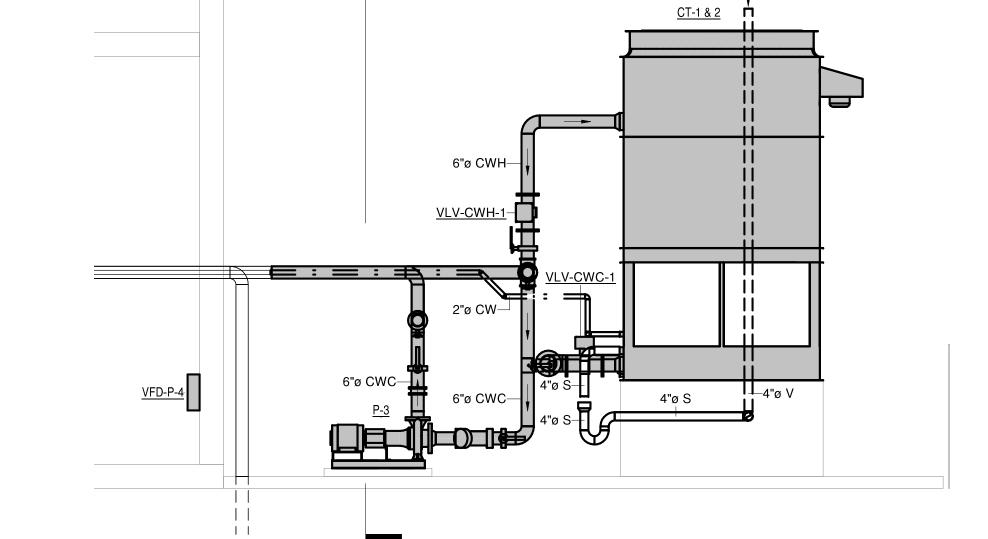
at the offices of: Halff Associates L______

5000 West Military Highway, Suite100 McAllen, Texas 78503-7446 TBPE FIRM #F-312

MECHANICAL/
PLUMBING SECTIONS &
ISOMETRICS

M1.02





2 HYDRONIC/PLUMBING SECTION 2

1 HYDRONIC/PLUMBING SECTION 1

1/4" = 1'-0"

	HVAC PIPING MATERIALS SCHEDULE												
CEDVICE	CI7E	DIDE	FITTINGS	JOINTS	HANGERS		INSULATION						
SERVICE	SIZE	FIFE	FITTINGS	JOHNIS	DOINTS HANGERS	CONDITIONED SPACES	UNCONDITIONED SPACES	OUTDOORS	NOTE				
CONDENSER WATER ABOVE GRADE (EXTERIOR)	ALL	PVC SCH 80	PVC (SOCKET)	SOLVENT WELD	GALVANIZED	N/A	N/A	NONE					

	COOLING TOWER SCHEDULE													
	DESCRIPTION PERFORMANCE										ELECTRICAL			
ТА	G MFGR.	MODEL	WET BULB DESIGN (°F)	WATER FLOW RATE (GPM)	CELL EWT (°F)	BASIN LWT (°F)	WETBULB WB (°F)	STATIC LIFT (FT)	ASHRAE 90.1 PERFORMANCE (GPM/HP)	AIRFLOW PERCELL (CFM)	MOTOR RPM	HP	V/PH/Hz	NOTES
СТ	-1 EVAPCO	USS 29-4K28	80	750	100	85	80	18	37.5	74,150	1800	20	460/3/60	ALL
СТ	-2 EVAPCO	USS 29-4K28	80	750	100	85	80	18	37.5	74,150	1800	20	460/3/60	ALL

- PROVIDE WITH INVERTER DUTY MOTORS WITH SHAFT GROUNDING RINGS.
- PROVIDE WITH FAN VIBRATION SHUT-OFF SWITCH. INSTALLING CONTRACTOR TO HARDWIRE TO DRY CONTACT AT VFD FOR SHUTDOWN.
- PROVIDE COMPLETE TYPE 304 STAINLESS STEEL CONSTRUCTION AND STAINLESS STEEL HARDWARE, INCLUDING WELDED COLD WATER BASIN, MECHANICAL SUPPORTS, CASUING PANELS, AND FAN SCREENS
- 4. PROVIDE WITH FAN MOTORS LOCATED OUTSIDE OF TOWER AIRSTREAM.
- PROVIDE WITH BELT DRIVEN FAN.
- COOLING TOWER MANUFACTURER SHALL ASSEMBLE COOLING TOWER ON SITE AND MOUNT ACCESSORIES. PIPING AND WIRING BY INSTALLING CONTACTOR.
- PROVIDE BOTTOM BFW/GROOVED OUTLET. SINGLE SIDE INLET CONNECTION
- PROVIDE EQUALIZER LINE CONNECTION FOR EACH CELL, 8" BFW/GROOVED CONNECTIONS. INSTALLING CONTRACTOR TO PROVIDE 8" EQUALIZER PIPING WITH LUG TYPE BUTTERFLY ISOLATION VALVE.
- PROVIDE LADDERS WITH SAFETY CAGES, SAFETY GATES, AND EXTERNAL SERVICE PLATFORMS TO ACCESS FAN, INTERNAL PLENUM WALKWAY, AND MECHANICAL. LADDERS SHALL EXTEND TO GRADE.
- 10. COOLING TOWER HOT WATER DISTRIBUTION SYSTEM SHALL BE CAPABLE OF OPERATING AT 750 GPM WHILE MAINTAINING A UNIFORM AIR-SIDE PRESSURE DROP THROUGH THE FILL TO MAXIMIZE COOLING TOWER EFFICIENCY AND MINIMIZE SCALE FORMATION IN THE FILL. SPRAY NOZZLES SHALL BE CAPABLE OF A MINIUM FLOW OF 35% OF DESIGN WATER FLOW WITHOUT DRY AREAS OF FILL MATERIAL.
- 11. TOWER SHALL BE CONSTRUCTED TO MEET THE FOLLOWING BUILDING CODE CONSTRAINTS:

- B. LFRD: 138 MPH, ASD 107 MPH
- C. BUILDING IMPORTANCE FACTOR: 1.0
- D. BUILDING CATEGORY: III
- E. BUILDING EXPOSURE: 6

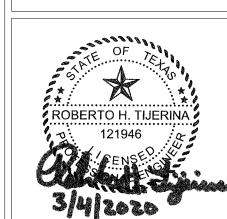
COOLING TOWERS HAVE BEEN PRE-PURCHASED BY OWNER FROM H.A. GRAY & ASSOCIATES TO ASSEMBLE TOWERS AND SET ON STRUCTURE. CONTRACTOR TO PIPE AND POWER TO PROVIDE COMPLETE OPERATION SYSTEM.

VARIABLE FREQUENCY DRIVE SCHEDULE												
PACKAGE	MARK	SERVES	EQUIP	HP	INPUT VOLT	OUTPUT VOLT	MOUNTING	ENCLOSURE	MANUF.	MODEL	HxWxD (IN.)	NOTES
UNDER BASE BID	VFD-P-3	P-3	PUMP	15	460/3	460/3	WALL	NEMA 1	YASKAWA	Z1000	11.8 x 7.9 x 7.9	1,3,4,5.6
UNDER BASE BID	VFD-P-4	P-4	PUMP	15	460/3	460/3	WALL	NEMA 1	YASKAWA	Z1000	11.8 x 7.9 x 7.9	1,3,4,5.6
UNDER ALTERNATE #1	VFD-CT-1	CT-1	COOLING TOWER	20	460/3	460/3	WALL	NEMA 1	YASKAWA	Z1000	11.8 x 7.9 x 7.9	1,3,4,5.6
UNDER ALTERNATE #1	VFD-CT-2	CT-2	COOLING TOWER	20	460/3	460/3	WALL	NEMA 1	YASKAWA	Z1000	11.8 x 7.9 x 7.9	1,3,4,5.6

- 1. VFD SHALL BE PROVIDED AND MOUNTED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR.
- 2. PROVIDE VFD WITH FUSED DISCONNECT. 3. PROVIDE VFD WITH NON-FUSED DISCONNECT.
- 4. PROVIDE BACNET FOR INTERFACE WITH DDC SYSTEM.
- 5. PROVIDE AUTOMATIC BYPASS.
- 6. PROVIDE AUXILARY CONTACT IN VFD TO INFERFACE WITH DISCONNECT FOR SHUTDOWN PROCESS.

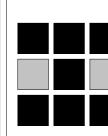
				Р	UMF	SCH	IEDU	ILE					
MARK	SERVICE	TYPE	GPM	DYNAMIC	RPM	MIN. EFF%	NPSH		MOTOR DATA	A	MANUFACTURER	MODEL	NOTES
				HEAD-FT			MAX. REQ	HP	VOLT	PHASE			
P-3	COND. WATER	END SUCTION	750	58	1800	83.7%	10.5	15	460	3	Bell & Gossett	1510	ALL
P-4	COND. WATER	END SUCTION	750	58	1800	83.7%	10.5	15	460	3	Bell & Gossett	1510	ALL

- 1. VARIABLE VOLUME PUMP POWERED THROUGH VARIABLE FREQUENCY DRIVE. PROVIDE SHAFT GROUNDING KIT.
- 2. PUMP BASE AND MOTOR SADDLE SHALL BE HOT DIPPED GALVANIZED. PUMP AND COUPLING GUARD SHALL HAVE TWO COATS OF EPOXY PAINT.
- 3. TEFC PREMIUM EFFICIENCY, SEVERE DUTY MOTOR.



The seal appearing on this document was authorized by:
ROBERTO H. TIJERINA
PE# 121946
03-04-2020

O3-04-2020
Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act.
The record copy of this drawing is on file at the offices of:
Halff Associates
5000 West Military Highway, Suite100
McAllen, Texas 78503-7446
TBPE FIRM #F-312



Project No: 37841 Ssued: 02/26/20		
ssuea: 02/26/20		
Revisions:		
lo. Date	Description	n
Drawn by: JB		
Checked by: RT		
Sheet Title		
	ECHANI CHEDUL	

ROBERTO H. TIJERINA

The seal appearing on this document was authorized by: ROBERTO H. TIJERINA PE# 121946 03-04-2020 Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act.

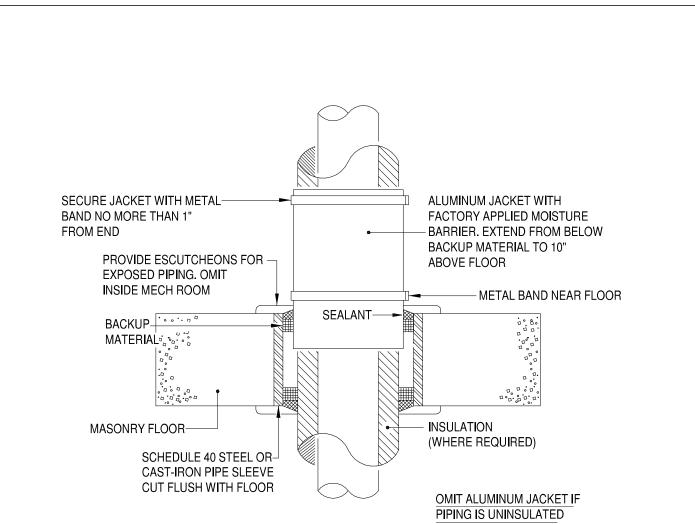
The record copy of this drawing is on file at the offices of:

Halff Associates 5000 West Military Highway, Suite100 McAllen, Texas 78503-7446 TBPE FIRM #F-312

Issued: 02/26/20 Drawn by: JB Checked by: RT

MECHANICAL DETAILS I

M3.01



TOWER DRAIN CONNECTION N.T.S.

PORT

9" INDUSTRIAL

THERMOMETER WITH

3/4" NPT BRASSWELL.

4"OVERLFOW -

6" HUB

DRAIN

LINE

FINISH

FLOOR

4"SEWER

DRAIN LINE

3/4" SUMP

DRAIN

▲ BY MECHANICAL

CONTRACTOR

BY PLUMBING

▼ CONTRACTOR

SHUT-OFF

44 44 44

VALVE

- 2" AIR GAP

MINIMUM

COOLING TOWER

PORT

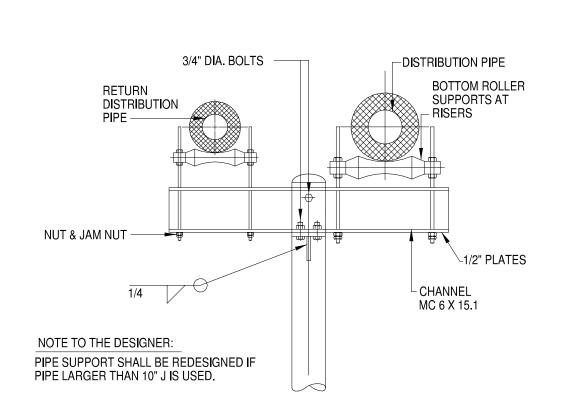
9" INDUSTRIAL

THERMOMETER WITH

3/4" NPT BRASSWELL.

ISOLATION

PIPE THRU FLOOR PENETRATION N.T.S.



TOWER CONNECTION N.T.S.

ISOLATION

MANUAL ISOLATION -

VALVE, TYP.

NOTE: STRUCTURAL DETAILS ARE TO BE USED

WHEN THE PIPING SUPPORTS ARE NOT

SPECIFIED BY STRUCTURAL ENGINEER.

(ON CANTILEVERED SUPPORTS)

(2)1/2" SADDLE BOLTS

7 TEE SUPPORT N.T.S.

GUSSET PLATE (4)

ON TEES OVER 12'

⁶45 TRIANGLE

SIDE = C/3

GUSSET PLATE

CANTILEVERES

BELOW

COLUMN

-MAX LENGTH ∖ "A" x .4

SEE DIMENSIONS

"H"(MAX)

AS REQ.

-RADIUS CORNER

-BOLT RADIUS "D"

-BOLT HOLE (TYP 4)

"B"——						TE	E SUPPORT CHA	ART								
			MARK	"Н"МАХ	MAX-LOAD LBS.	COLUMN	TEE/BEAM	SIDE ARM	BASE PLATE	BOLTS	SIZE	Α	В	С	D	Е
	////////	TEE/BEAM	T1	8'-0"	3500	3"SCH.40	C7x9.8	C4x5.4	10x10x3/8"	4	1/2"	24"	7"	10"	5 1/2"	18"
			T2	8'-0"	5200		C8x11.5					36"	8"			24"
			T3	8'-0"	7000		C10x15.3					48"	10"			30"
		1/4"	T4	8'-0"	8600	\	C10x15.3		•		 	60"	10"	↓		36"
			T5	12'-0"	3500	3"SCH.40	C7x9.8	C4x5.4	10x10x3/8"	4	1/2"	24"	7"	10"	5 1/2"	18"
			T6	12'-0"	5200		C8x11.5					36"	8"			24"
			T 7	12'-0"	7000		C10x15.3					48"	10"			30"
			T8	12'-0"	8600	↓	C10x15.3				\	60"	10"	↓		36"
			Т9	16'-0"	3500	4"SCH.40	C7x9.8	C4x5.4	12x12x5/8"	4	1/2"	24"	7"	12"	7"	18"
			T10	16'-0"	5200		C8x11.5					36"	8"			24"
			T11	16'-0"	7000		C10x15.3					48"	10"			30"
			T12	16'-0"	8600	\	C10x15.3	 	•		↓	60"	10"	↓		36"
		_BOLTS ANCHOR TYPE	T13	20'-0"	3500	6"SCH.40	C7x9.8	C4x5.4	14x14x3/4"	4	1/2"	24"	7"	14"	7 7/8"	18"
		ANUMONTIFE	T14	20'-0"	5200		C8x11.5					36"	8"			24"
			T15	20'-0"	7000		C10x15.3					48"	10"			30"
		BASE PLATE THK. SEE CHART	T16	20'-0"	8600	↓ ↓	C10x15.3				↓	60"	10"			36"
						NOTES:										

1 CARRYING CAPACITY BASED ON ONE (1) 10"Ø PIPE PER FOOT, 20' JOINT, STD WEIGHT W/WATERFILL.

2 CANTILEVER & SINGLE SIDE LOADS SHALL NOT EXCEED 1/2 THE RATE "MAX-LOAD".

3 SIDE ARM LOADS SHALL BE 1/3 TH "MAX-LOAD" AND THE HEIGHT OF THE SIDE ARM SHALL BE LESS THAN B/2.

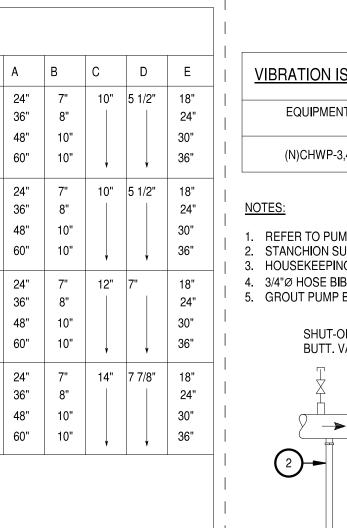
4 USE 36 KSI ASTM A36 STEEL.

4 END SUCTION PUMP
N.T.S.

OF VIBRATION ISOLATOR (N)CHWP-3,4 (N)CHWP-3,4 NON-SLAM CHECK 1. REFER TO PUMP PIPING & GAUGE SPECIFICATIONS VALVE 2. STANCHION SUPPORT ON SUCTION END. VIBRATION ISOLATOR HOUSEKEEPING PAD THICKNESS 4"; CHAMFER EDGES 1" FITTING(S) 4. 3/4"Ø HOSE BIBB DRAIN W/CAP 5. GROUT PUMP BASE AS REQ'D P GAUGE COCK AND GAUGE OR PETE'S PLUG RE: NOTE 1 THERMOWELL BUTT. VALVE INCREASER AS REQUIRED COUPLING GUARD REQ'D./OSHA COMPLIANT \rightarrow

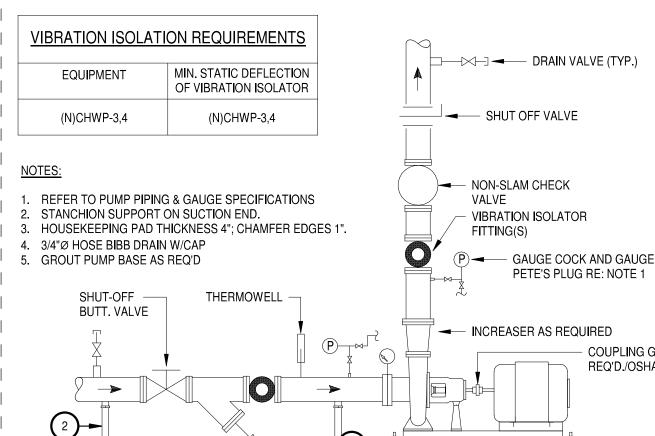
(5) PIPE GUIDE N.T.S.

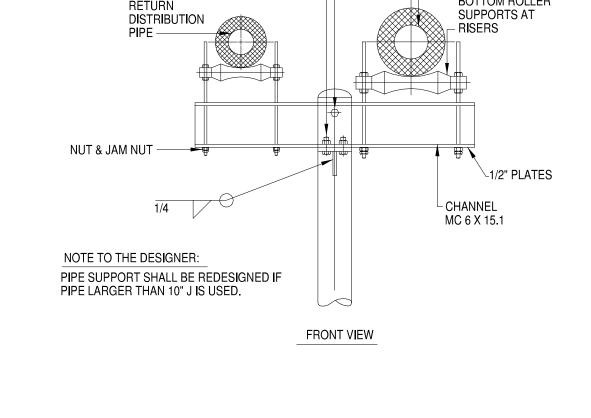
DRAIN VALVE (TYP.) MIN. STATIC DEFLECTION - RESTRAINED SPRING STRAINER -VIBRATION ISOLATOR



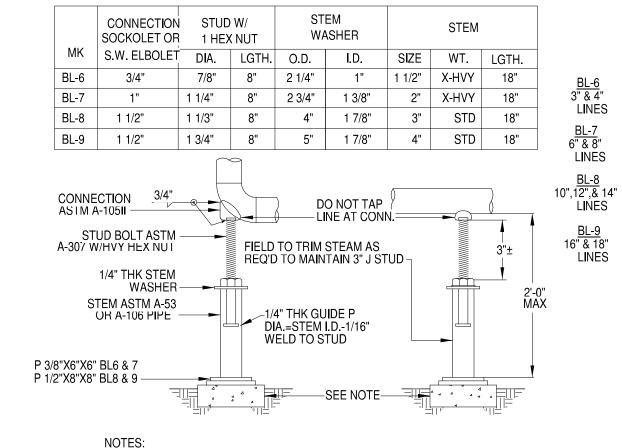
- MANUAL ISOLATION

VALVE, TYP.





TYPE D 4" THRU 12"



MATERIAL NOTES 1.) MATERIAL, UNLESS OTHERWISE NOTED, SHALL BE A.S.T.M. A-36 OR A-285C

WITH A.S.T.M. A-123.

MARK NUMBERS.

LINE SIZE

3/4" THRU 3'

4" THRU 6"

8" THRU 10" 12" THRU 16"

18" THRU 24"

5/16"CONT.WELD FOR

1/4"CONT.WELD FOR

8"TO 12"ELL.

4"OR 6"ELL.

6"SCH. 40 PIPE

FOR 8"TO 12"ELL.

3"SCH.40 PIPE

4"SCH. 40 PIPE

3/4"PL⁻OR 8"TO 12"ELL.

7/8"PLFOR 8"TO 12"ELL.

5/8"PLFOR 4"OR 6"ELL.

3/4"PL⁻OR 4"OR 6"ELL

8"TO 12"ELL.

4"OR 6"ELL.

W/ RETAINER ROD

FOR 4"ELL.

FOR 6"ELL.

SHALL BE HEAVY HEX. TYPE.

FORCES ON EQUIPMENT OR SUPPORTS.

FABRICATED IN ACCORDANCE WITH THE A.I.S.C. CODE OF STANDARD PRACTICE.

2.) SURFACE PREPARATION OR PAINTING WILL BE REQUIRED ONLY IF NOTED BELOW. GALVANIZING IF REQUIRED SHALL BE 2 OZ. MINIMUM COAT IN ACCORDANCE

3.) GALVANIZED MATERIAL THAT IS FIELD CUT, DRILLED OR WELDED, SHALL BE

4.) ALL BOLTING MATERIAL SHALL CONFORM TO A.S.T.M. SPEC. A-307. NUTS

GENERAL NOTES

SUPPORTS.

5.) VENDOR TO FABRICATE & ASSEMBLE AS REQUIRED, AND TAG ASSEMBLY WITH

AS APPLIED TO ANCHORS, GUIDES, AND MISCELLANEOUS

1.) THIS DRAWING SPECIFIED TYPE AND APPLICATION OF NORMAL SUPPORT, GUIDE,

& ANCHOR REQUIREMENTS FOR PIPING ON PIEWAYS, IN STRUCTURES, & AT

2.) SELECTION AND APPLICATION OF TYPE SHALL BE MADE AFTER CONSIDERATION

PIPE GUIDES SHALL NOT BE PLACED CLOSER THAN 40 PIPE DIAMETERS FROM

VERTICAL RUN

25 FT. CENTERS

35 FT. CENTERS

50 FT. CENTERS

60 FT. CENTERS

GENERAL NOTES-PIPE SUPPORTS

*USE 9" ALLOY STUB

ON ALLOY LINE.

DRILL 1" HOLES FOR

3/4" ANCHOR BOLTS.

(TYPICAL)

1 <u>_</u>∕A) _3/8"&1/4"

CONT.WELD

HAS BEEN GIVEN TO EFFECTS FROM TEMPERATURE EXPANSION AND REACTION

A DIRECTIONAL CHANGE OF PIPE, EXCEPT WHERE REQUIRED BY STRESS ANALYSIS.

PIPE GUIDE SPACING TABLE

HORIZONTAL RUN

APPROX. 50 FT. CENTERS (SEE GENERAL NOTE 4)

APPROX. 150 FT. CENTERS

1 3/4"LG. BOLTS W/FLAT

WASHER FOR 3/4"FL

1 1/2"LG. BOLTS W/FLAT

--DRILL 13/16"∅ IN TOP PL TAP BOTTOM P FOL 3/4"

6"TO 12"ELL.

PIPE SUPPORT & ANCHOR FOR USE

ARRANGEMENT & SPOOL CALL-OUTS ARE TYPICAL OF TYPE-A

AT PUMPS & TURBINES

4"OR 6"ELL.

10-UNC-2B THREADS.

WASHER FOR 5/8"FL

COATED WITH GALVACON OR EQUAL ON EXPOSED SURFACES.

1) FIELD TO POUR 4" MIN. THICKNESS 2) FIELD TO PROVIDE GROUT WHERE REQUIRED. PAD UNDER ALL BASE ELLS WHEN USED IN UNPAVED AREAS.

*STEM LENGTH MAY BE INCREASE TO 36" BY USING THE NEXT LARGER CATAGORY OF BASE LEG IE: USE A BL-8 OR 6" OR 8" PIPING.

TYPE BL BASE LEG SUPPORT-ADJUSTABLE

The seal appearing on this document was authorized by: ROBERTO H. TIJERINA PE# 121946 03-04-2020 Alteration of a sealed document without proper notification to the responsible

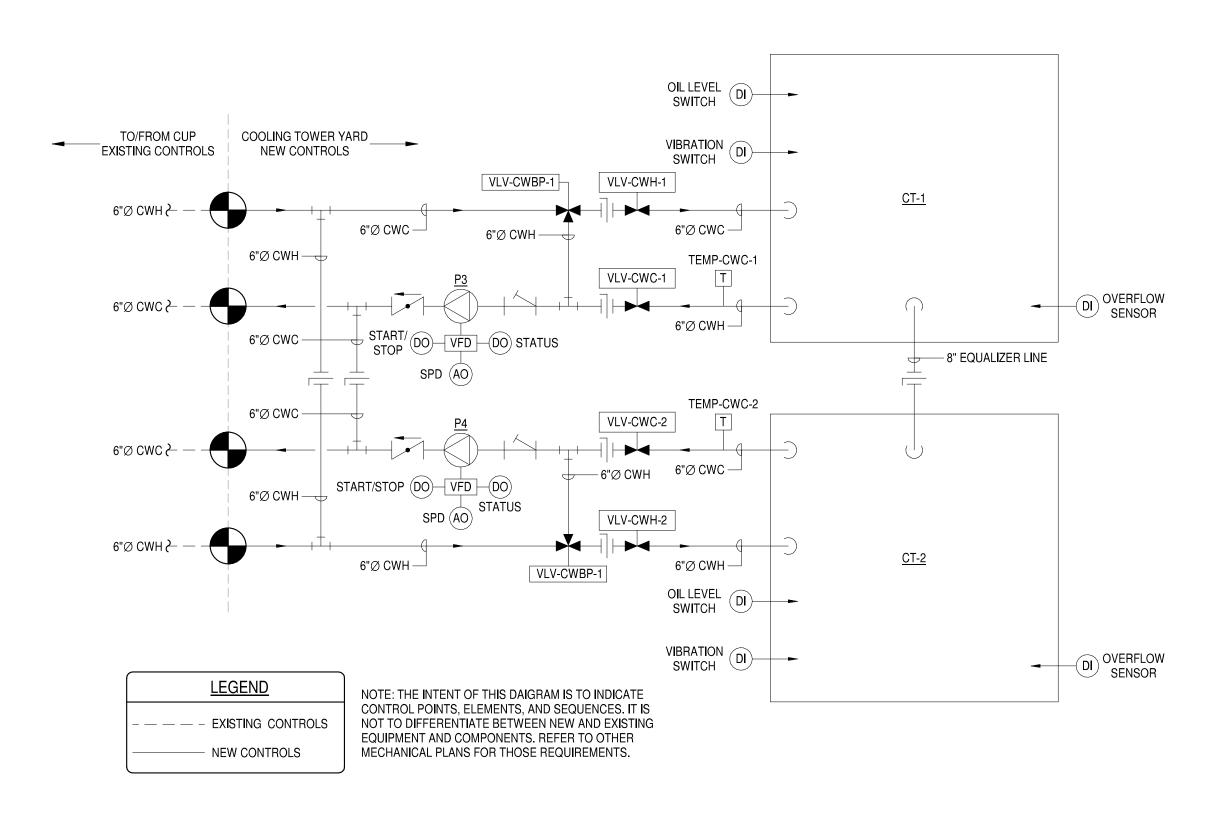
engineer is an offence under the Texas Engineering Practice Act. The record copy of this drawing is on file at the offices of: Halff Associates

5000 West Military Highway, Suite100 McAllen, Texas 78503-7446 TBPE FIRM #F-312

Projec	ct No: 37841	.00	1	
Issued	d: 02/26/20			
Revisi	ions:			
No.	Date		Description	
Drawr	by: JB			
Check	ked by: RT			
Sheet	Title			

MECHANICAL CONTROL DIAGRAM I

M4.01



MECHANICAL CHILLED WATER FLOW

INPUT/OUTPUT SUMMARY AI AO DI DO SP POINT NAME SENSOR TYPE COMMENT VFD-CT-1, DO-START/STOP, AO-SPD, DI-STATUS, ALARM COOLING TOWER (CT-1) FAN START/STOP, STATUS, SPEED, AND ALARM BACNET COMM ELECTRONICALLY ACTUATED VALVE DO(2)-OPEN AND CLOSE, DI-POSITION COOLING TOWER (CT-1) CONDENSER WATER COLD CONTROL VALVE ELECTRONICALLY ACTUATED VALVE DO(2)-OPEN AND CLOSE, DI-POSITION COOLING TOWER (CT-1) CONDENSER WATER HOT CONTROL VALVE DI - STATUS, ALARM COOLING TOWER (CT-1) VIBRATION SWITCH BACNET COMM DI - STATUS, ALARM COOLING TOWER (CT-1) OIL LEVEL SWITCH BACNET COMM COOLING TOWER (CT-2) VIBRATION SWITCH BACNET COMM DI - STATUS, ALARM COOLING TOWER (CT-2) OIL LEVEL SWITCH BACNET COMM DI - STATUS, ALARM 1 DEVICE: VFD-CT-2, DO-START/STOP, AO-SPD, DI-STATUS, ALARM BACNET COMM COOLING TOWER (CT-2) FAN START/STOP, STATUS, SPEED, AND ALARM ELECTRONICALLY ACTUATED VALVE DO(2)-OPEN AND CLOSE, DI-POSITION | X | X COOLING TOWER (CT-2) CONDENSER WATER COLD CONTROL VALVE | X | X ELECTRONICALLY ACTUATED VALVE DO(2)-OPEN AND CLOSE, DI-POSITION COOLING TOWER (CT-2) CONDENSER WATER HOT CONTROL VALVE 1 DEVICE: VFD-P-3, DO-START/STOP, AO-SPD, DI-STATUS, ALARM BACNET COMM CONDENSER WATER PUMP (P-3) START/STOP, STATUS, SPEED, AND ALARM 1 DEVICE: VFD-P-4, DO-START/STOP, AO-SPD, DI-STATUS, ALARM BACNET COMM CONDENSER WATER PUMP (P-4) START/STOP, STATUS, SPEED, AND ALARM $X \mid X \mid X$ CONDENSER WATER FLOW (FLOW-CW) FLOW METER CONDENSER WATER BYPASS VALVE (VLV-CWBP-1) ELECTRONICALLY ACTUATED VALVE AO-OPEN AND CLOSE, AI-POSITION CONDENSER WATER BYPASS VALVE (VLV-CWBP-2) $X \mid X \mid X$ ELECTRONICALLY ACTUATED VALVE AO-OPEN AND CLOSE, AI-POSITION Х TEMPERATURE SENSOR OUTSIDE AIR DRY BULB TEMPERATURE OUTSIDE AIR WET BULB TEMPERATURE TEMPERATURE SENSOR MAKEUP WATER METER SUB METER OVERFLOW SENSOR FLOAT SWITCH OVERFLOW SENSOR FOR EACH TOWER

THE CURRENT/EXISTING LEAD/LAG CHILLER, PRIMARY CHILLED WATER PUMP, AND CONDENSER WATER PUMP SHALL REMAIN. THE CONTROL SEQUENCES SHALL BE UNALTERED EXCEPT AS NOTED HEREIN FOR TOWER CONTROL.

COOLING TOWER CONTROL: TWO TOWERS SHALL ENABLE DURING PLANT OPERATION EXCEPT AS FOLLOWS:

1. A FAILURE OF EITHER TOWER

2. A LOW LOAD CONDITION IN WHICH BOTH TOWERS AT LOW SPEED PROVIDE A CONDENSER WATER SUPPLY BELOW 50°F (SEE TOWER SEQUENCE BELOW).

BOTH TOWERS SHALL OPERATE IN PARALLEL TO MAINTAIN A CONDENSER WATER SUPPLY TEMPERATURE EQUAL TO THE LESSER OF 85°F OR 5°F ABOVE AMBIENT WET BULB TEMPERATURE. IF BOTH TOWERS IN OPERATION PROVIDE A CONDENSER WATER SUPPLY THAT REACHES 55°F (OR AS RECOMMENDED BY CHILLER MANUFACTURER), AND BOTH TOWERS ARE OPERATING AT MINIMUM FAN SPEED. THE LAG TOWER SHALL BE DISABLED AND THE LAG TOWER'S AUTO ISOLATION VALVES SHALL SHALL CLOSE. SINGLE TOWER OPERATION SHALL CONTINUE TO MAINTAIN 50°F. IF LEAD TOWER VFD IS AT MINIMUM AND CWS FALLS BELOW 50°F, CONDENSER WATER BYPASS VALVE SHALL MODULATE OPEN TO MAINTAIN 50°F. AS CONDENSER WATER TEMPERATURE INCREASES, SEQUENCE SHALL BE REVERSED UNIL BOTH TOWERS ARE AGAIN OPERATIONAL. IF CONDENSOR WATER BYPASS-VALVE IS OPEN AT TIME OF LEAD CHILLER SHUTDOWN, BYPASS VALVE CLOSURE SHALL BE PART OF SHUTDOWN SEQUENCE PRIOR TO SHUTDOWN OF PUMPS.

CONDENSER WATER PUMPS SHALL BE OPERATED AND HAVE SPEED CONTROL BASED UPON TESTING, ADJUSTING, AND BALANCING. WHEN A SINGLE CHILLER AND CONDENSER WATER PUMP ARE OPERATING, VFD ON LEAD PUMP SHALL MODULATE TO FREQUENCY TO PROVIDE 750 GPM. WHEN BOTH CHILLERS AND CONDENSER WATER PUMPS ARE OPERATING, CONDENSER WATER PUMP VFD'S SHALL MODULATE TOGETHER TO A FREQUENCY TO PROVIDE 750 GPM. NOTE THAT WHEN CONDENSOR WATER BYPASS IS ACTIVE AND VFD SHALL OPERATE AT FREQUENCY PRIOR TO BYPASS SEQUENCE START. DURING SINGLE CHILLER DUAL TOWER OPERATION, SET EACH PUMP VFD SPEED AT 375 GPM.

ELECTRICAL SYMBOLS & ABBREVIATIONS

NOT ALL SYMBOLS MAY BE USED ON THIS PROJECT.

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
<u> </u>	GENERAL	<u> </u>	FIRE ALARM	<u> </u>	OUTLET DEVICES
CON	CONTACTOR	V	VISUAL ANNUNCIATOR - WALL MOUNTED	ф	SIMPLEX RECEPTACLE - 20A - 120V - NEMA 5-20R
J	JUNCTION BOX - CEILING MOUNTED	А	AUDIBLE ANNUNCIATOR - WALL MOUNTED	Ь	DUPLEX RECEPTACLE - 20A - 120V - NEMA 5-20R
HJ	JUNCTION BOX - WALL MOUNTED	V	VISUAL ANNUNCIATOR - CEILING MOUNTED	•	DUPLEX RECEPTACLE - 20A - 120V - NEMA 5-20R CONNECTED TO
РВ	PULL BOX - SIZE AS INDICATED	A	AUDIBLE ANNUNCIATOR - CEILING MOUNTED	₩	STANDBY POWER DISTRIBUTION SYSTEM
RLY	RELAY PANEL	AV	AUDIBLE/VISUAL ANNUNCIATOR - WALL MOUNTED		DUPLEX RECEPTACLE - 20A - 120V - NEMA 5-20R WITH INTEGRAL GROUND FAULT PROTECTION
S	SPEAKER - CEILING MOUNTED	AV	AUDIBLE/VISUAL ANNUNCIATOR - CEILING MOUNTED	фxx	DUPLEX RECEPTACLE 20A 12OV - NEMA 5-20R IG=ISOLATED GROUND
HS	SPEAKER - WALL MOUNTED	SS	SPEAKER STROBE ANNUNCIATOR - WALL MOUNTED		C=CEILING MOUNTED WP=NEMA 3R WHILE IN USE
РВ	PUSHBUTTON	SS	SPEAKER STROBE ANNUNCIATOR - CEILING MOUNTED		AC=ABOVE COUNTER
$\bigcirc\bigcirc$	CLOCK - CEILING MOUNTED - SINGLE OR DOUBLE FACE	В	BELL ANNUNCIATOR	#	QUADRUPLEX RECEPTACLE - 20A - 120V - NEMA 5-20R - INTERNAL MARKINGS AND/OR ABBREVIATIONS FOR DUPLEX RECEPTACLES
HOO	CLOCK - WALL MOUNTED - SINGLE OR DOUBLE FACE		SMOKE FIRE DAMPER		APPLY
DPB	DURESS ALARM BUTTON	(H)	HEAT DETECTOR	\Diamond	SPECIAL PURPOSE RECEPTACLE - VERIFY EQUIPMENT REQUIREMENTS PRIOR TO SUBMISSION OF BID OR PROPOSAL
CR	CARD READER	S	SMOKE DETECTOR	⋈ xx	FLOOR OUTLET DEVICE - SINGLE SERVICE - POWER - SUBSCRIPT
MS	MOTION SENSOR	SDS	DUCT SMOKE DETECTOR	Ŭ [™]	INDICATES TYPE - SEE SCHEDULES AND SPECIFICATIONS
ML	MAGNETIC DOOR LOCK	F	MANUAL PULL STATION	⚠ xx	FLOOR OUTLET DEVICE - MULTIPLE SERVICE - POWER AND DATA - SUBSCRIPT INDICATES TYPE - SEE SCHEDULES AND SPECIFICATIONS
DP	DOOR POSITION SWITCH	TS	SPRINKLER SYSTEM TAMPER SWITCH	⊘ xx	FLOOR OUTLET DEVICE - DATA - SUBSCRIPT INDICATES TYPE - SEE
VS	VIBRATION SWITCH	FS	SPRINKLER SYSTEM FLOW SWITCH		SCHEDULES AND SPECIFICATIONS
		DH	MAGNETIC DOOR HOLDER	▼	TELEPHONE OUTLET ROUGH-IN PER DETAIL
		FH	EXTERIOR WEATHERPROOF HORN	∇	DATA OUTLET ROUGH-IN PER DETAIL
	LIGHTING	IT	INDICATOR TEST SWITCH	Δ	COMBINATION TELEPHONE AND DATA OUTLET
0	RECESSED DOWNLIGHT			$\underline{\Psi}$	CABLE TELEVISION OUTLET
•	RECESSED DOWNLIGHT WALL WASH FIXTURE - CLEAR SIDE INDICATES DIRECTION OF WASH				
Ю	WALL MOUNTED FIXTURE - SCONCE				
	2' X 4' RECESSED TROFFER - CEILING OR WALL MOUNTED				
	FIXTURE CONNECTED TO EMERGENCY SYSTEM OR WITH		SWITCH DEVICES		PANELS AND RELATED ITEMS (FLOORPLANS) PANELBOARD - SEE ONE-LINE DIAGRAM - PANEL SCHEDULE
	BATTERY BACK UP - EMERGENCY EGRESS LIGHT	\$	SWITCH - SINGLE POLE		SWITCHBOARD OR DISTRIBUTION PANEL - SEE ONE-LINE DIAGRAM - PANEL
0 🗵	FIXTURE CONNECTED TO UNSWITCHED PHASE CONDUCTOR - NIGHT LIGHT	\$ (x)	SWITCH - DOUBLE POLE, 3-WAY OR 4 WAY		SCHEDULE
$\underline{\otimes}$ $\underline{\Theta}$	EXIT LIGHT, SINGLE/DOUBLE FACE CEILING MOUNTED WITH ARROWS AS INDICATED IN DRAWINGS	\$OC	SWITCH - DIGITAL WITH INTEGRAL OC SENSOR		TRANSFORMER WITH HOUSEKEEPING PAD - SEE ONE-LINE DIAGRAM
	EXIT LIGHT, WALL MOUNTED, SINGLE/DOUBLE FACE WITH	\$RL	SWITCH - DIGITAL WITH ON/OFF/RAISE LOWER CONTROL		
₩ ₩	ARROWS AS INDICATED IN DRAWINGS	\$ D	SWITCH - DIGITAL WITH ON/OFF/DIMMER CONTROL	ATS	AUTOMATIC TRANSFER SWITCH
\Box	EMERGENCY LIGHT - BATTERY TYPE WITH CHARGER	\$⊤	SWITCH - TIMER	EGB	ELECTRICAL DISTRIBUTION GROUNDING BUSBAR
A	SYMBOL IDENTIFYING FIXTURE TYPE. ALL FIXTURES THIS ROOM ARE FIXTURE TYPE INDICATED UNLESS	\$M	SWITCH - MOTOR RATED - WITH THERMAL OL SIZED PER MFR		
	INDIVIDUALLY MARKED	(OS)	OCCUPANCY SENSOR - CEILING MOUNTED	TGB	TELECOMMUNICATIONS GROUNDING BUSBAR
	POLE MOUNTED LUMINAIRE - QUANTITY AS INDICATED	(DS)	DAYLIGHT SENSOR - CEILING MOUNTED		
\ll	EXTERIOR FLOOD LIGHT	PC	PHOTOCELL		

SYMBOL	DESCRIPTION RACEWAYS
	CONDUIT CONCEALED IN WALL OR CEILING WITH ONE PHASE - NEUTRAL AND GROUND CONDUCTOR UNLESS OTHERWISE NOTED
	CONDUIT UNDER FLOOR - UNDER GROUND OR CAST IN STRUCTURE WITH ONE PHASE - NEUTRAL AND GROUND CONDUCTOR UNLESS OTHERWISE NOTED
PIA-2,4,6	BRANCH CIRCUIT HOMERUN SUBSCRIPT INDICATES PANEL AND BREAKER
	SWITCH LEG
// <u></u>	POWER DISTRIBUTION (ONE-LINE DIAGRAMS CIRCUIT BREAKER - DRAW OUT WITH LSIG ELECTRONIC TRIP UNIT
≪ ↔	CIRCUIT BREAKER - DRAW OUT WITH LSIG ELECTRONIC TRIP UNIT
6 6	CIRCUIT BREAKER - MOLDED CASE WITH ELECTRONIC LSI TRIP UNIT 400A AND ABOVE
XXXXX	FEEDER SIZE - SEE SCHEDULE
∆ulu Ymm	TRANSFORMER WITH WINDING CONNECTIONS AS INDICATED
Ē	GROUNDING CONNECTION, SIZED PER NEC
þ	FUSE
	DISCONNECT SWITCH (AMPERAGE RATING/NO. POLES/FUSE SIZE/ENCLOSURE)
	MOTOR STARTER - AS INDICATED
	MOTOR STARTER WITH DISCONNECT - AS INDICATED
\bigcirc	MOTOR
•	EQUIPMENT ELECTRICAL CONNECTION PER MANUFACTURER'S REQUIREMENTS
DPM	DIGITAL POWER METER
SPD	SURGE PROTECTION DEVICE
MS	FULL VOLTAGE STARTER
SS	SOFT STARTER

ABBREVIATIONS

۸	AMPERE(O)	IZM	I/II OMATT
A	AMPERE(S)	KW	KILOWATT
AC	ABOVE FINISHED COUNTER	KWH	KILOWATT HOUR
A/C	AMPERE INTERRUPTING CARACITY	LB	POUND
AIC	AMPERE INTERRUPTING CAPACITY	M	MANHOLE
AFF	ABOVE FINISHED FLOOR	MAX	MAXIMUM
AFG	ABOVE FINISHED GRADE	MCC	MOTOR CONTROL CENTER
AHU	AIR HANDLING UNIT	MECH	MECHANICAL
ATS	AUTOMATIC TRANSFER SWITCH	MFD	MANUFACTURED
BAS	BUILDING AUTOMATION SYSTEM	MFR	MANUFACTURER
BFF	BELOW FINISHED FLOOR	MH	MOUNTING HEIGHT
BFG	BELOW FINISHED GRADE	MIN	MINIMUM
BLDG	BUILDING	MLO	MAIN LUGS ONLY
C	CONDUIT	MS	MOTOR STARTER, FULL VOLTAGE
CB	CIRCUIT BREAKER	MTG	MOUNTING
CCTV	CLOSED CIRCUIT TELEVISION	NA	NOT APPLICABLE
CKT	CIRCUIT	NC	NORMALLY CLOSED
COND	CONDUCTOR	NF	NON FUSED
DIA	DIAMETER	NO	NORMALLY OPEN
DIST	DISTRIBUTION	OC	OCCUPANCY
DDC	DIRECT DIGITAL CONTROL	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
DN	DOWN	OL	OVERLOADS SIZED PER MFR REQ'T
DWGS	DRAWINGS	Р	POLE
EC	EMPTY CONDUIT	PA	PUBLIC ADDRESS
EDF	ELECTRIC DRINKING FOUNTAIN	PB	PUSHBUTTON
EF	EXHAUST FAN	PC	PHOTO CELL
EMCS	ENERGY MGMT CONTROL SYSTEM	PH	PHASE
EMT	ELEC. METALLIC TUBING	PNL	PANELBOARD
EQMT	EQUIPMENT	PSI	POUNDS PER SQUARE INCH
EXH	EXHAUST	PVC	POLY VINYL CHLORIDE CONDUIT
EXP	EXPLOSION PROOF	PWR	POWER
EXTG	EXISTING	RGS	RIGID GALVANIZED STEEL
FA	FIRE ALARM	RNC	RIGID NONMETALLIC CONDUIT
FC	FOOTCANDLES	SC	SPLIT CIRCUIT
FCU	FAN COIL UNIT	SS	SOFT STARTER
FLEX	FLEXIBLE METAL CONDUIT	SQFT	SQUARE FOOT
FT	FEET, FOOT	SUSE	SUITABLE FOR USE AS SERVICE ENTRANCE
GALV	GALVANIZED	SW	SWITCH
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	SWBD	SWITCHBOARD
GND	GROUND	TSTAT	THERMOSTAT
HP	HORSEPOWER	TV	TELEVISION
HOA	HAND OFF AUTOMATIC	UON	UNLESS OTHERWISE NOTED
HVAC	HEATING/VENTILATING/AIR CONDITIONING	V	VOLT(S)
HZ	HERTZ	VFD	VARIABLE FREQUENCY DRIVE
IC	INTERCOM	VP	VAPOR PROOF
ID	INSIDE DIAMETER	W	WIRE
IMC	INTERMEDIATE STEEL CONDUIT	WP	WEATHERPROOF
IN	INCHES	XFMR	TRANSFORMER
IG	ISOLATED GROUND	Z	IMPEDANCE
JB	JUNCTION BOX	1P	SINGLE POLE
KV	KILOVOLT	2P	TWO POLE
	KILOVOLT AMPERE	3P	THREE POLE

GENERAL PROJECT NOTES:

- ALL WORK TO BE COMPLETED IN ACCORDANCE WITH THE FOLLOWING:
 1.1. 2017 NATIONAL ELECTRICAL CODE, NEC
 1.2. ANY ADDITIONAL REQUIREMENTS ADOPTED BY LOCAL AUTHORITIES HAVING JURISDICTION.
- 2. CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND FAMILIARIZING HIMSELF WITH THE REQUIREMENTS OF THESE CODES PRIOR TO SUBMISSION OF PROPOSAL AND COMPLETING ALL WORK IN ACCORDANCE WITH SUCH. CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTION OF ANY WORK NOT COMPLETED IN ACCORDANCE WITH THESE CODES.
- 3. NO TERM, PROVISION OR REQUIREMENTS OF THESE DRAWINGS OR SPECIFICATIONS, WHETHER IMPLICIT OR EXPLICIT, SHALL BE CONSTRUED AS WAIVING ANY OF THE RULES, REGULATIONS OR REQUIREMENTS OF THESE CODES.
- 4. IN THE EVENT OF A CONFLICT BETWEEN ANY OF THE CODES AND THE PROJECT DOCUMENTS, THE MORE STRINGENT REQUIREMENT OR THAT CALLING FOR THE GREATER AMOUNT OF WORK OR MATERIALS SHALL TAKE PRECEDENCE.
- 5. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND PROJECT REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ALL WORK NOT COMPLETED IN ACCORDANCE WITH SPECIFICATIONS.
- 6. ALL UTILITY OUTAGES TO BE COORDINATED WITH OWNER MINIMUM (2) WEEKS PRIOR TO OUTAGE.
- 7. THE CONTRACTOR SHALL INCLUDE IN HIS BID OR PROPOSAL ALL COSTS ASSOCIATED WITH LOCATING AND IDENTIFYING

- ALL EXISTING UNDERGROUND UTILITIES THAT MAY CONFLICT WITH NEW WORK OR MAY BE DAMAGED DURING EXCAVATION OPERATIONS THAT ARE PART OF THE INSTALLATION OF NEW WORK. THE CONTRACTOR SHALL COORDINATE NEW WORK WITH EXISTING UNDERGROUND UTILITIES AND REROUTE AS REQUIRED. ANY DAMAGE TO EXISTING UNDERGROUND UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 8. ALL WORK SHALL BE PERFORMED BY QUALIFIED, LICENSED ELECTRICIANS, UNDER THE SUPERVISION AND DIRECTION OF A SUPERINTENDENT HAVING SUCCESSFUL EXPERIENCE COMPLETING PROJECTS OF COMPARABLE SCOPE AND COMPLEXITY.
- 9. COORDINATE WORK WITH ALL OTHER TRADES. GIVE SPECIAL CONSIDERATION TO COORDINATING INSTALLATION OF LIGHTING, SPRINKLER PIPING, AND DUCTWORK.
 COORDINATE WALL OUTLET LOCATIONS WITH MILLWORK.
 COORDINATE WALL SWITCHES WITH DOOR SWINGS. VERIFY EXACT LOCATION, COLOR AND FINISH OF OUTLETS AND DEVICES WITH ARCHITECT OR DESIGNATED TENANT REPRESENTATIVE PRIOR TO ROUGH-IN.
- 10. ALL ELECTRICAL DISTRIBUTION EQUIPMENT,
 TRANSFORMERS, PANELBOARDS, DISCONNECTS, ETC. SHALL
 BE IDENTIFIED AS INDICATED ON THE CONTRACT DRAWINGS
 USING MECHANICALLY FASTENED ENGRAVED LAMINATED
 PLASTIC NAMEPLATES. NAMEPLATES SHALL INDICATE
 EQUIPMENT NAME, VOLTAGE, AND SOURCE.
- 11. UPON COMPLETION OF WORK, PREPARE "AS-BUILT"
 DRAWINGS IN ELECTRONIC FORMAT DEPICTING ALL
 DEVIATIONS FROM THE ORIGINAL DRAWINGS. HANDWRITTEN
 MARKUPS ARE NOT ACCEPTABLE. PROVIDE COMPLETED

- DRAWINGS TO THE OWNER IN BOTH IN CAD AND PDF FORMATS.
- 12. PENETRATIONS OF WALLS, FLOORS AND ROOF FOR THE PASSAGE OF ELECTRICAL RACEWAYS SHALL BE APPROVED BY THE STRUCTURAL ENGINEER. PENETRATIONS ARE TO BE PROPERLY SEALED AFTER INSTALLATION OF RACEWAYS TO MAINTAIN THE STRUCTURAL, WATERPROOF AND FIREPROOF INTEGRITY OF THE WALL, FLOOR OR ROOF SYSTEM.
- 13. CONTRACTOR SHALL NOTIFY ENGINEER WHERE FIELD CONDITIONS VARY FROM CONSTRUCTION DOCUMENTS.
- 14. CONTRACTOR SHALL COORDINATE WITH ENGINEER ON ANY CHANGES TO ELECTRICAL PANEL SCHEDULES.
- 15. SWITCHES FOR SUPPLY AND EXHAUST FANS TO BE PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. COORDINATE WITH MECHANICAL CONTRACTOR ON DEVICE REQUIREMENTS. PROVIDE ADDITIONAL DISCONNECT MEANS WHERE CONTROL SWITCH DOES NOT MEET NEC REQUIREMENTS FOR LOCAL DISCONNECT MEANS.
- 16. ALL MECHANICAL EQUIPMENT CONDUIT AND CONTROL WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
- 17. JUNCTION BOXES AND OUTLET BOXES SHALL BE RECESSED IN WALLS. CONCEAL CONDUIT IN WALLS OR ABOVE CEILING, UNLESS OTHERWISE NOTED.
- 18. PROVIDE 3/4" CONDUIT WITH BUSHING AND PULL STRING FROM DATA AND TELEPHONE OUTLETS TO 6" ABOVE CEILING IN OFFICE AREAS AND TO BOTTOM OF STRUCTURAL JOIST IN EXPOSED CEILING AREAS.

- 19. ALL FUSES 600 AMPERES OR LESS SHALL BE CLASS RK-1, DUAL ELEMENT, TIME DELAY, 250 VOLT OR 600 VOLT AS REQUIRED BY APPLICATION.
- PROVIDE SEPARATE COPPER GROUNDING CONDUCTOR SIZED PER NEC ARTICLE 250 FOR EACH CIRCUIT. USE OF CONDUIT SYSTEM OR RACEWAYS FOR GROUNDING IS NOT ACCEPTABLE.
- BE DEEMED EVIDENCE BY THE CONTRACTOR OF THE FOLLOWING:
 21.1. THE CONTRACTOR HAS THOROUGHLY REVIEWED AND IS

21. CONTRACTOR'S SUBMISSION OF A BID OR PROPOSAL SHALL

- IN FULL UNDERSTANDING OF THE DRAWINGS AND SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS AND ALL REQUIREMENTS CONTAINED THEREIN.

 21.2. THE CONTRACTOR HAS THOROUGHLY REVIEWED THE
- DRAWINGS AND SPECIFICATIONS AND HAS SUFFICIENT FAMILIARITY OF EXISTING SITE CONDITIONS AND THE REQUIREMENTS NECESSARY FOR THE SUCCESSFUL COMPLETION OF THE PROJECT.

 21.3. WHERE THE CONTRACTOR FEELS THERE IS AN
- OMISSION, LACK OF CLARITY OR AMBIGUITY IN THE CONTRACT DOCUMENTS, HE HAS SUBMITTED A WRITTEN REQUEST FOR INFORMATION AND HAS RECEIVED AN ACCEPTABLE RESPONSE PROVIDING SUFFICIENT INFORMATION TO ALLOW HIM TO PROCEED WITH FULL UNDERSTANDING OF THE PROJECT REQUIREMENTS AND HAS INCLUDED ALL ASSOCIATED COSTS IN HIS BID OR PROPOSAL.
- 21.4. THE CONTRACTOR HAS IDENTIFIED AND HAS INCLUDED ALL INCIDENTAL COSTS, FEES AND CHARGES IN HIS PROPOSAL RELATING TO THE SCOPE OF WORK CONTAINED IN THESE DOCUMENTS.

- 21.5. THE CONTRACTOR HAS CONFIRMED WITH THE ENGINEER THAT HE HAS RECEIVED AND ADDRESSED AS REQUIRED ALL ADDENDA RELATED TO THE PROJECT.
- 21.6. THE CONTRACTOR HAS SUCCESSFULLY COMPLETED PROJECTS OF COMPARABLE SCOPE AND COMPLEXITY AND HAS ACCESS TO THE SKILLS, EQUIPMENT AND RESOURCES NECESSARY TO COMPLETE THIS TYPE OF WORK.

ELECTRICAL SHEET LIST

E0.00 ELECTRICAL COVER SHEET

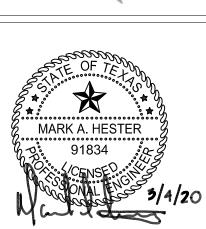
E1.00 ELECTRICAL SITE PLAN

E4.00 ONE-LINE DIAGRAM, LOAD ANALYSIS

E4.00 ONE-LINE DIAGRAM, LOA
E4.01 ELECTRICAL DETAILS

ECISD ROBERT VELA COOLING TOWER INSTALLATION





The seal appearing on this document was authorized by:
MARK A. HESTER
PE# 91834
03/04/2020
Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.
The record copy of this drawing is on file at the offices of:
Halff Associates
100 NE Loop 410, Suite 200
San Antonio, Texas 78216
TBPELS FIRM #F-312

5000 WEST MILITARY, SUITE 100 McALLEN, TEXAS 78503 TEL (956) 664-0286 FAX (956) 664-0282 Firm Registration F-312

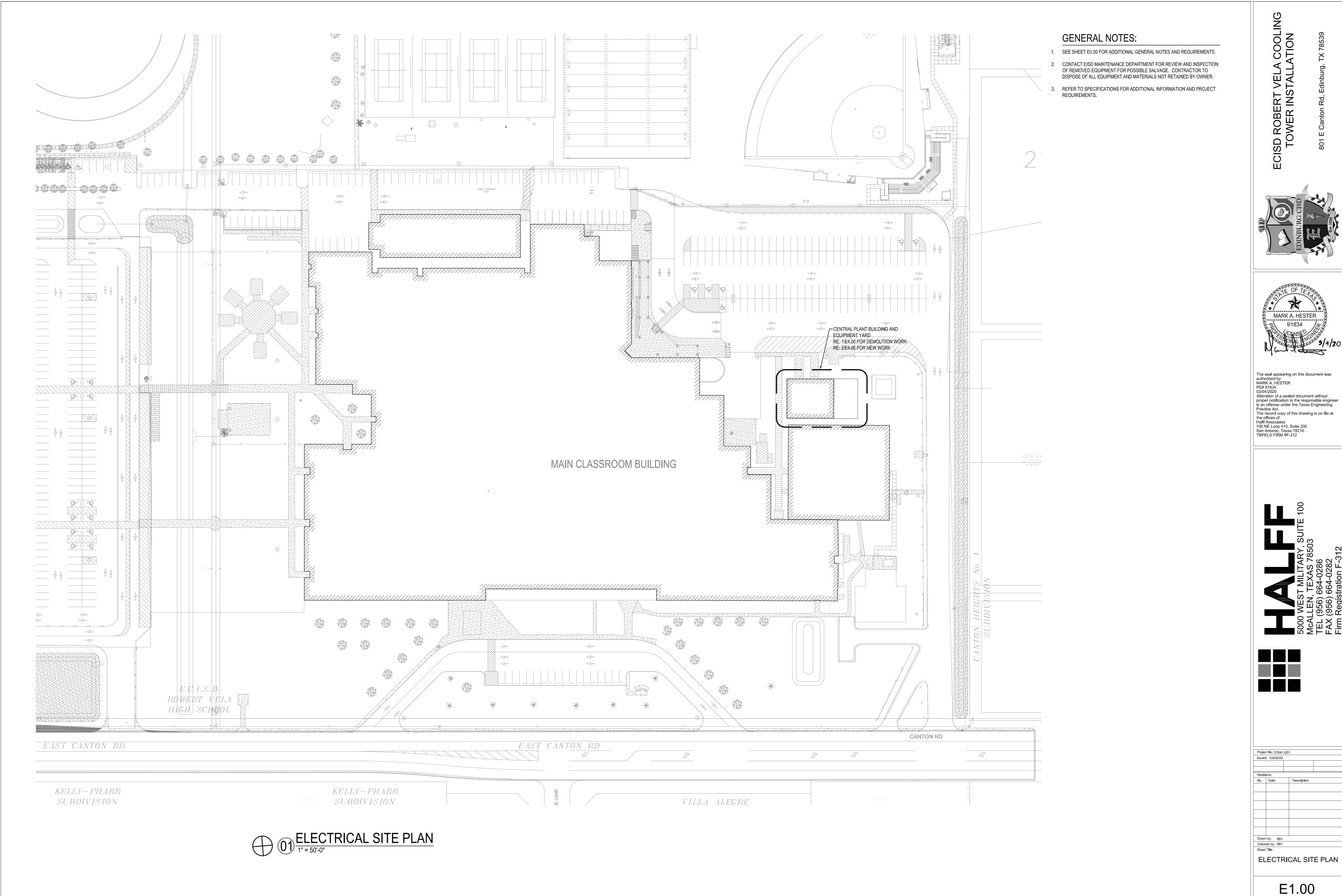


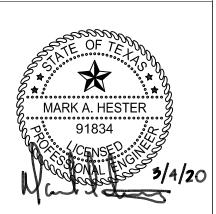
Droie	ct No: 37841	00.	1	
			ı	
Issue	d: 03/04/20			I
Revis	ions:			
No.	Date		Description	
Draw	n by: MH			
Chec	ked by: MH			
Shee	t Title			

F0 00

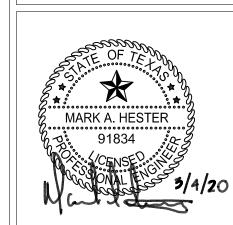
ELECTRICAL COVER

SHEET

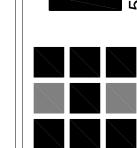








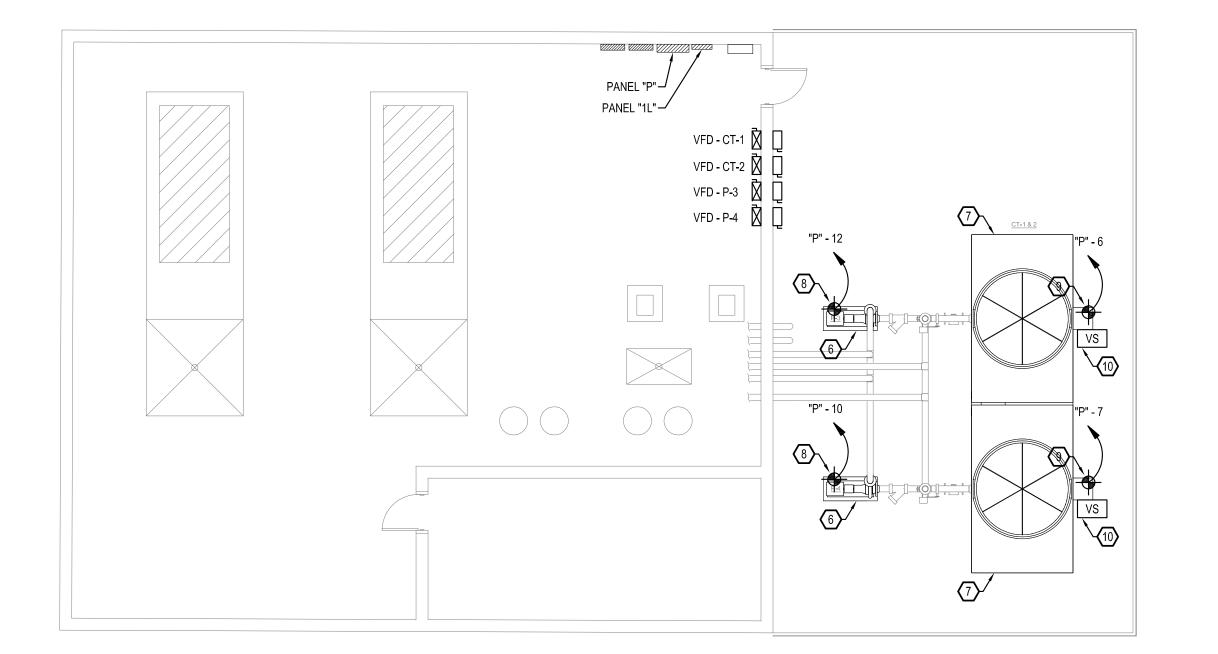
The seal appearing on this document was authorized by:
MARK A. HESTER
PE# 91834 PE# 91834
03/04/2020
Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.
The record copy of this drawing is on file at the offices of:
Halff Associates
100 NE Loop 410, Suite 200
San Antonio, Texas 78216
TBPELS FIRM #F-312



ONE LINE DIAGRAM LOAD ANALYSIS

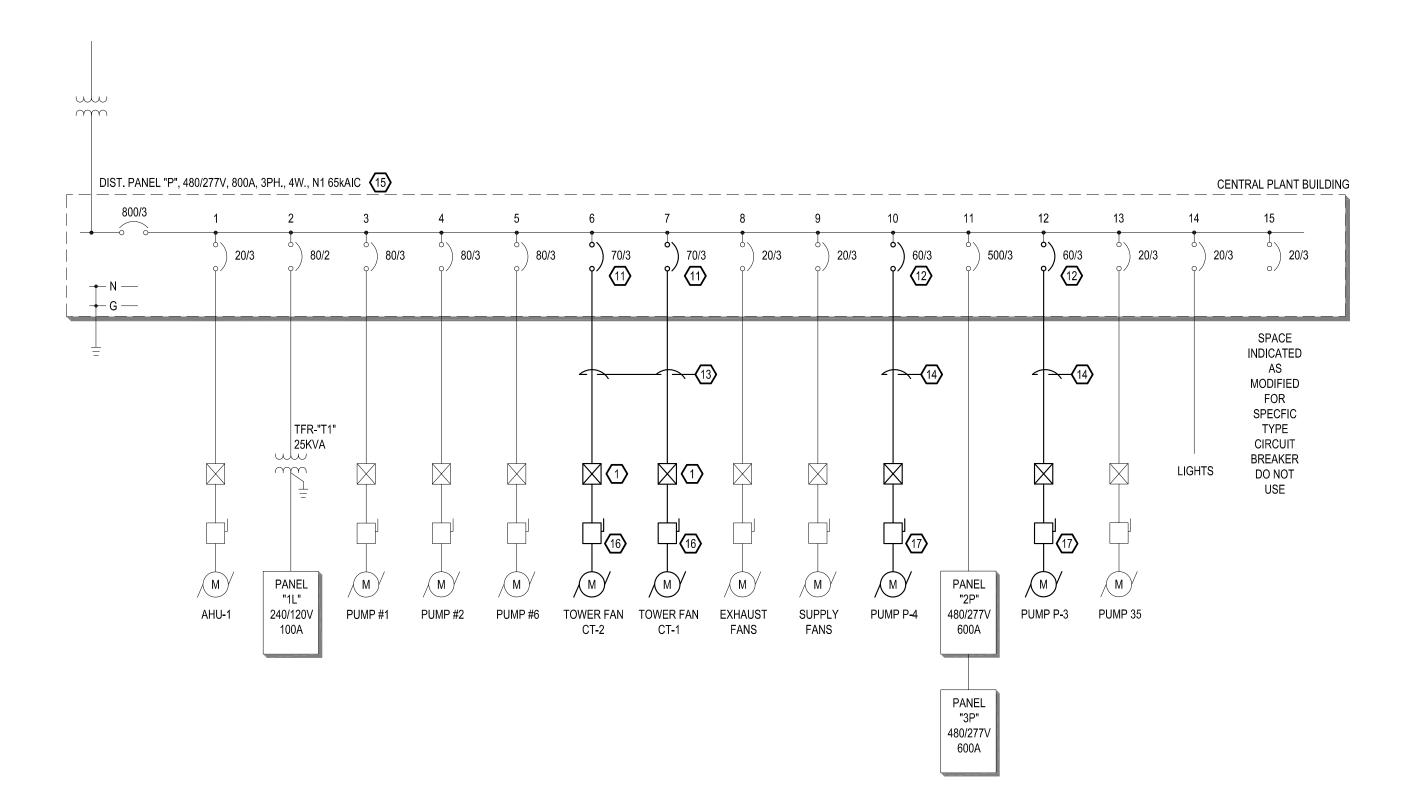
Checked by: MH

PANEL "1L" -



CHILLER YARD PARTIAL PLAN - ELECTRICAL DEMOLITION 1/8" = 1'-0"

CHILLER YARD PARTIAL PLAN - ELECTRICAL NEW WORK



93 PARTIAL ONE-LINE DIAGRAM NO SCALE

KEYED NOTES:⊗

1. EXISTING VARIABLE FREQUENCY DRIVE TO BE REUSED UNDER BASE BID AND REPLACED AND CAP. WHERE CONDUITS PENETRATE WALL, SEAL PENETRATIONS WITH APPROVED MATERIAL SUITABLE FOR BUILDING TYPE AND CONSTRUCTION AND PAINT TO MATCH

GENERAL NOTES:

LOCAL, STATE AND FEDERAL REQUIREMENTS.

PANEL "P" LOAD ANALYSIS:

TÓTAL REMOVED LOAD TOTAL 79.8KVA

TOTAL ADDED LOAD TOTAL 79.8KVA

PANEL "P: NET CHANGE IN LOAD

REMOVED LOAD
(2) - 15HP 17.5KVA / MOTOR (CONDENSER WATER PUMPS)

(2) - 20HP 22.4KVA / MOTOR (COOLING TOWER FANS)

ADDED LOAD
(2) - 15HP 17.5KVA / MOTOR (CONDENSER WATER PUMPS)
(2) - 20HP 22.4KVA / MOTOR (COOLING TOWER FANS)

BY OWNER.

1. CONTRACTOR SHALL EXERCISE SUFFICIENT CARE TO MINIMIZE DAMAGE TO VARIABLE

2. ALL REMOVED CONDUCTORS AND CABLING TO BE RETURNED TO OWNER FOR SALVAGE.

3. ALL OTHER MATERIALS TO BE DISPOSED OF BY CONTRACTOR IN ACCORDANCE WITH

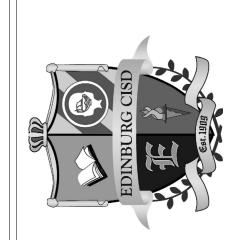
4. DELIVER ALL RETAINED ITEMS AND MATERIALS TO LOCATION DESIGNATED BY OWNER.

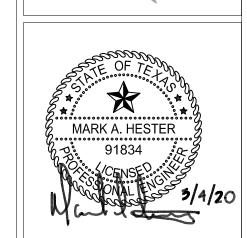
FREQUENCY DRIVES, MOTOR STARTERS AND DISCONNECTS DURING REMOVAL FOR REUSE

- 2. EXISTING MOTOR STARTER TO BE REMOVED. REMOVE ALL ASSOCIATED CONDUIT AND CONDUCTORS. WHERE CONDUITS PENETRATE, WALL SEAL PENETRATIONS WITH APPROVED MATERIAL SUITABLE FOR BUILDING TYPE AND CONSTRUCTION AND PAINT TO MATCH ADJACENT FINISH.
- 3. EXISTING DISCONNECT SWITCH TO BE REMOVED. REMOVE ALL ASSOCIATED CONDUIT AND CONDUCTORS. WHERE CONDUIT ENTERS FOUNDATION, CUT 6" AFF, THREAD AND CAP. WHERE CONDUITS PENETRATE WALL, SEAL PENETRATIONS WITH APPROVED MATERIAL SUITABLE FOR BUILDING TYPE AND CONSTRUCTION AND PAINT TO MATCH ADJACENT FINISH.
- OTHERS. REMOVE ALL ASSOCIATED CONDUIT AND CONDUCTORS. WHERE CONDUIT ENTERS FOUNDATION, CUT 6" AFF, THREAD AND CAP. WHERE CONDUITS PENETRATE WALL, SEAL PENETRATIONS WITH APPROVED MATERIAL SUITABLE FOR BUILDING TYPE AND CONSTRUCTION AND PAINT TO MATCH ADJACENT FINISH.
- 5. EXISTING COOLING TOWER FAN TO BE REMOVED BY OTHERS. REMOVE ALL ASSOCIATED AND CAP. WHERE CONDUITS PENETRATE WALL, SEAL PENETRATIONS WITH APPROVED MATERIAL SUITABLE FOR BUILDING TYPE AND CONSTRUCTION AND PAINT TO MATCH
- 6. NEW CONDENSER WATER PUMP BY DIVISION 23.
- 9. PROVIDE EQUIPMENT CONNECTION AS REQUIRED FOR NEW COOLING TOWER FAN. HOMERUN THROUGH DISCONNECT AND VARIABLE FREQUENCY DRIVE AS INDICATED.
- SHUTDOWN SWITCH. PROVIDE INTERPOSING RELAY PER DETAIL, RE: 3/E4.01. LOCATE RELAY ENCLOSURES ABOVE VARIABLE FREQUENCY DRIVES. THIS WORK TO BE INCLUDED AS PART OF BASE BID.

- 16. 100/3/NF/N3R

- UNDER ALTERNATE #1. IF ALTERNATE #1 IS SELECTED REMOVE VFD AND ALL ASSOCIATED CONDUIT AND CONDUCTORS. WHERE CONDUIT ENTERS FOUNDATION, CUT 6" AFF, THREAD
- 4. EXISTING COOLING TOWER WATER CONDENSER PUMP TO BE REMOVED BY
- CONDUIT AND CONDUCTORS. WHERE CONDUIT ENTERS FOUNDATION, CUT 6" AFF, THREAD
- 7. NEW COOLING TOWER BY DIVISION 23.
- 8. PROVIDE EQUIPMENT CONNECTION AS REQUIRED FOR NEW CONDENSER WATER PUMP. HOMERUN THROUGH DISCONNECT AND MOTOR STARTER AS INDICATED. MOTOR STARTER BY DIV 23. COORDINATE EXACT LOCATION WITH DIV 23 PRIOR TO ROUGH-IN.
- VARIABLE FREQUENCY DRIVE BY DIV 23. COORDINATE EXACT LOCATION WITH DIV 23 PRIOR
- 10. PROVIDE CONDUIT AND CONDUCTORS AS REQUIRED FOR COOLING TOWER FAN VIBRATION
- 11. PROVIDE NEW 70/3 CB WITH ALL REQUIRED MOUNTING HARDWARE.
- 12. PROVIDE NEW 60/3 CB WITH ALL REQUIRED MOUNTING HARDWARE.
- 13. (3) #4, (1) #8 G. (1) 1" C.
- 14. (3) #6, (1) #6 G. (1) 3/4" C.
- 15. VERIFY LOADS AND REATTACH ALL LOOSE LOAD IDENTIFICATION TAGS WITH MECHANICAL FASTENERS.
- 17. 60/3/NF/N3R





The seal appearing on this document was authorized by:
MARK A. HESTER
PE# 91834 Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act The record copy of this drawing is on file at the offices of:
Halff Associates
100 NE Loop 410, Suite 200
San Antonio, Texas 78216
TBPELS FIRM #F-312

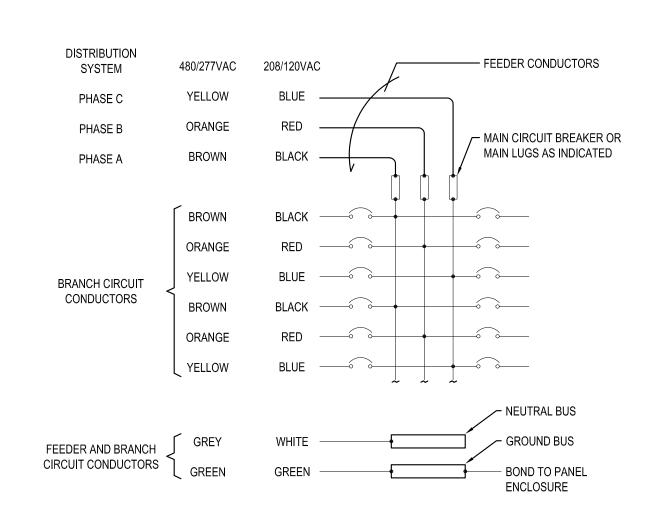


Projec	ct No: 37841.	001	
Issue	d: 03/04/20		
Revis	ions:		
No.	Date	Description	
Drawı	n by: MH		
Checl	ked by: MH		
Sheet	Title	·	
ΕL	ECTR	ICAL DE	TAILS

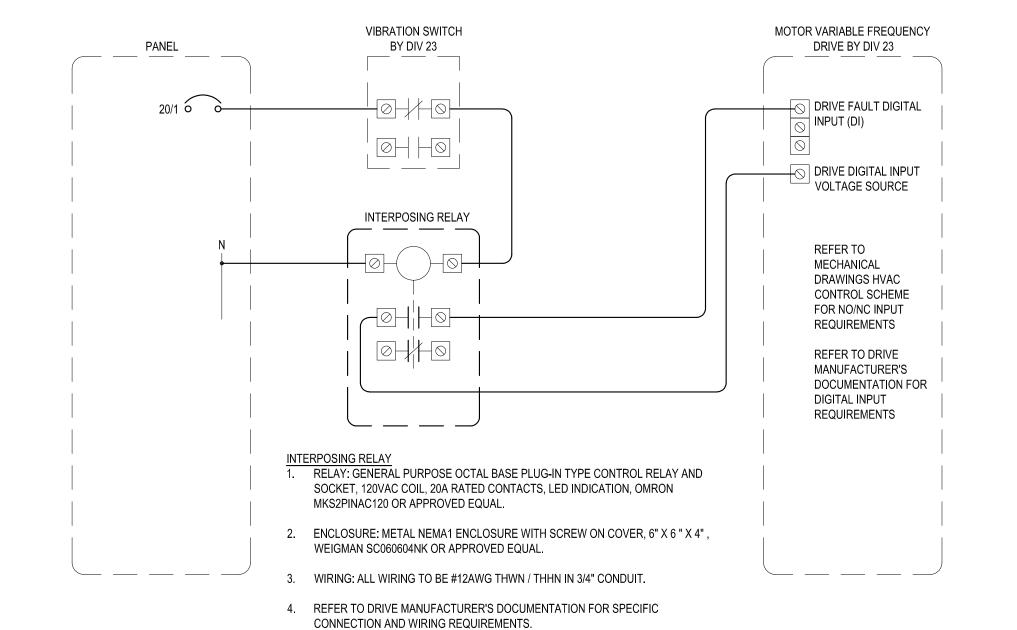
E4.01

UNDER NO CIRCUMSTANCES SHALL ANY SUPPORTS BE INSTALLED IN SUCH A WAY AS TO WEAKEN OR CRIPPLE BUILDING STRUCTURAL MEMBERS. CONTRACTOR SHALL VERIFY REQUIREMENTS AND LIMITATIONS PRIOR TO MOUNTING SUPPORT HARDWARE. DOUBLE NUT AND LOCKWASHER SUPPORT LENGTH VARIES. COORDINATE - 3/8" DIAMETER MIN. WITH OTHER TRADES THREADED ROD. AS REQUIRED TO PRIOR TO INSTALLATION MIN. 8" SPACE FOR FUTURE TOP AND BOTTOM - 1-5/8" UNISTRUT OR **EQUIVALENT** STEEL PLATE WITH DOUBLE NUT AND LOCKWASHER

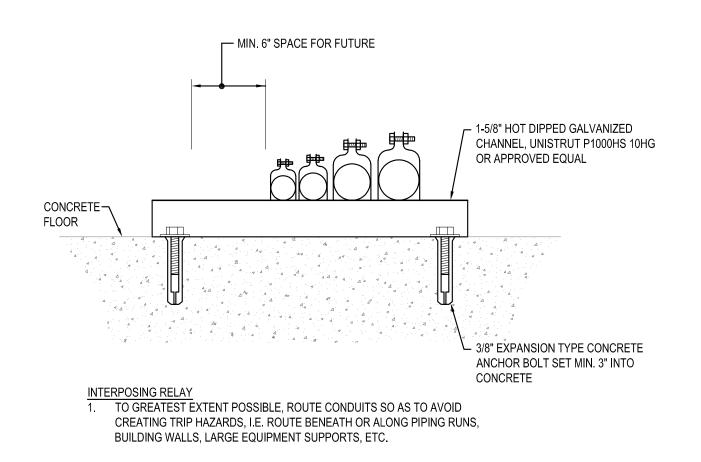












O4 CONDUIT FLOOR SUPPORT DETAIL
NOT TO SCALE