DRAWING INDEX

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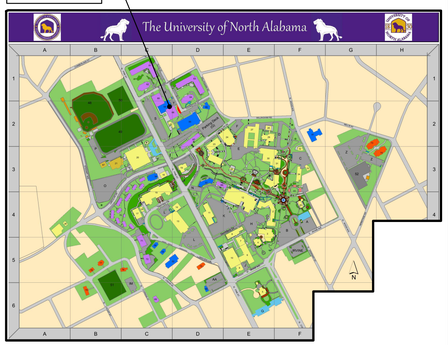
PROJECT LOCATION



University of NORTH ALABAMA
1830

FLORENCE, ALABAMA

RICE AND RIVERS HALL
CHILLER AND COOLING TOWER REPLACEMENT

CONTRACT DOCUMENTS

May 30, 2019

ENGINEERED SOLUTIONS INCORPORATED
CONSULTING ENGINEERS

1813 University Drive NW - Suite 200 - Huntsville, AL 35801
PH: (256) 533-3482 - FAX: (256) 539-1205
ESI Project #: 19-002

MECHANICAL ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
ABV	ABOVE	GPM	GALLON PER MINUTE
A/E	ARCHITECT / ENGINEER	HD	HEAD
AFF	ABOVE FINISHED FLOOR	HOA	HAND-OFF-AUTOMATIC SWITCH
AFG	ABOVE FINISHED GRADE	HP	HORSE POWER
AMB	AMBIENT	HT.	HEIGHT
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	HTR.	HEATER
APPROX.	APPROXIMATELY	HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS	HWP	HOT WATER PUMP
AUX	AUXILLARY	HWR	HOT WATER RETURN
AWWA	AMERICAN WATER WORKS ASSOCIATION	HWS	HOT WATER SUPPLY
BAS	BUILDING AUTOMATION SYSTEM	HZ	HZ FREQUENCY
BFC	BELOW FINISHED CEILING	ID	INSIDE DIAMETER
BFG	BELOW FINISHED GRADE	IN.	INCHES
BHP	BRAKE HORSE POWER	INV.	INVERT
BOP	BOTTOM OF PIPE	IN.-WC	INCHES OF WATER COLUMN
BTU	BRITISH THERMAL UNIT	IPS	INTERNATIONAL PIPE STANDARD
BTUH	BRITISH THERMAL UNIT PER HOUR	KW	KILOWATT
CCT	CONTROL CIRCUIT TRANSFORMER	KWH	KILOWATT HOUR
CF	CUBIC FEET	LAT	LEAVING AIR TEMPERATURE (°F)
CFH	CUBIC FEET PER HOUR	LB.	POUND
CH	CHILLER	LBS.	POUNDS
CHWP	CHILLED WATER PUMP	LWT	LEAVING WATER TEMPERATURE (°F)
CHWR	CHILLED WATER RETURN	LPR	LOW PRESSURE STEAM CONDENSATE RETURN
CHWS	CHILLED WATER SUPPLY	LPS	LOW PRESSURE STEAM (15 PSIG & BELOW)
CKT	CIRCUIT	MAX.	MAXIMUM
℄	CENTERLINE	MBH	BTU PER HOUR (THOUSAND)
CO	CLEAN-OUT	MCA	MINIMUM CIRCUIT AMPS
CONC.	CONCRETE	MECH.	MECHANICAL
CONN.	CONNECTION	MFR.	MANUFACTURER
CONT.	CONTINUATION	MIN.	MINIMUM
CONT'R	CONTRACTOR	MISC.	MISCELLANEOUS
CT	COOLING TOWER	MOCP	MAXIMUM OVERCURRENT PROTECTION
CTOC	CENTER TO CENTER	MUW	MAKE-UP WATER
CW	COLD WATER	N/A	NOT APPLICABLE
CWP	CONDENSER WATER PUMP	N.C.	NORMALLY CLOSED
CWR	CONDENSER WATER RETURN	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
CWS	CONDENSER WATER SUPPLY	NIC	NOT IN CONTRACT
Db	DRY BULB TEMPERATURE (°F)	N.O.	NORMALLY OPEN
dB	DECIBEL	NOM.	NOMINAL
DDC	DIRECT DIGITAL CONTROL	NTS	NOT TO SCALE
DEG.	DEGREE	O.A.T.	OUTSIDE AIR TEMPERATURE (°F)
DIA.	DIAMETER	O.C.	ON CENTER
DN.	DOWN	O.L.'S	OVERLOADS
DPR	DAMPER	ORIG.	ORIGINAL
Dp	DEWPOINT TEMPERATURE (°F)	P	PUMP
D.P.S.T.	DOUBLE POLE SINGLE THROW	PD	PRESSURE DROP (FEET OF WATER)
DWG.	DRAWING	PRESS.	PRESSURE
EA.	EACH	PRV	PRESSURE REDUCING VALVE
E.A.	EXHAUST AIR	PSI	POUNDS PER SQUARE INCH
EAT	ENTERING AIR TEMPERATURE (°F)	PSIA	PSI ABSOLUTE
EER	ENERGY EFFICIENCY RATIO	PSIG	PSI GAUGE
EF	EXHAUST FAN	PT	PRESSURE/TEMPERATURE TEST PLUG
ELEC.	ELECTRICAL	SMACNA	SHEET METAL AND A/C CONTRACTORS NATIONAL ASSOC.
ELEV.	ELEVATION	SP.	STATIC PRESSURE (INCHES OF WATER)
EQUIP.	EQUIPMENT	SPECS.	SPECIFICATIONS
ET	EXPANSION TANK	S.P.S.T.	SINGLE POLE SINGLE THROW
EWB	ENTERING WET BULB TEMPERATURE (°F)	STD.	STANDARD
EWT	ENTERING WATER TEMPERATURE (°F)	TEMP.	TEMPERATURE
EXH.	EXHAUST	T.O.D.	TOP OF DUCT
EXIST.	EXISTING	TOT.	TOTAL
EXP.	EXPANSION	TYP.	TYPICAL
F	DEGREES FARENHEIT	UH	UNIT HEATER
FD	FLOOR DRAIN	UL	UNDERWRITERS LABORATORIES
FLG.	FLANGE	V	VOLTS/VOLTAGE
FLR.	FLOOR	VFD	VARIABLE FREQUENCY DRIVE
FPM	FEET PER MINUTE	VOL.	VOLUME
FRAC.	FRACTIONAL	W	WATT
FT.	FOOT OR FEET	W/	WITH
GA.	GAUGE	Wb	WET BULB TEMPERATURE (°F)
GAL.	GALLONS	WTR.	WATER
GALV.	GALVANIZED	XFMR	TRANSFORMER

NOTE: ALL ABBREVIATIONS MAY NOT BE APPLICABLE TO THIS PROJECT.

CONTROLS

SYMBOL	DESCRIPTION
T	ROOM THERMOSTAT
T	REMOTE BULB THERMOSTAT
T	DUCT OR PIPE THERMOSTAT WITH AVG. ELEMENT
T	DUCT OR PIPE TEMPERATURE SENSOR
C	HOLDING COIL IN MOTOR STARTER
R2	RELAY COIL
R2-A	CONTACT, NORMALLY OPEN (N.O.)
R2-B	CONTACT, NORMALLY CLOSED (N.C.)
	SWITCH
R	PILOT LIGHT (RED)
DP	DIFFERENTIAL PRESSURE SENSOR
	THERMOMETER
	PRESSURE GAUGE & GAUGE COCK
AO	ANALOG OUTPUT
AI	ANALOG INPUT
BO	BINARY OUTPUT
BI	BINARY INPUT
FS	FLOW SWITCH
CT	CURRENT TRANSDUCER
•	ALARM POINT ON DDC SYSTEM
HOA	HAND-OFF-AUTOMATIC SWITCH

PIPING SYMBOLS

SYMBOL	DESCRIPTION
	LOW PRESSURE STEAM (15 PSIG & BELOW)
	LOW PRESSURE STEAM CONDENSATE RETURN
	CONDENSATE PUMP DISCHARGE
V V	VENT LINE
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CD	CONDENSATE DRAIN (INSULATED)
MUW	MAKE-UP WATER (NON-POTABLE)
	UNION IN LINE
	INCREASER OR REDUCER
SLOPE	SLOPE PIPING IN DIRECTION OF ARROW

DRAWING SYMBOLS

SYMBOL	DESCRIPTION
X / Y	SECTION LETTER DRAWING NUMBER WHERE DRAWN
X / Y	EQUIPMENT DESIGNATION EQUIPMENT NUMBER

DRAWING IDENTIFICATION

SYMBOL	DESCRIPTION
A / M3.1	A: LARGE SCALE PLAN IDENTIFIER M3.1: DRAWING NUMBER WHERE SHOWN

VALVES

SYMBOL	DESCRIPTION
	GATE VALVE
	GLOBE VALVE
	GATE VALVE WITH 3/4" HOSE ADAPTER
	CHECK VALVE
	ANGLE GLOBE VALVE
	BUTTERFLY VALVE (LUG TYPE/LEVER HANDLE)
	BUTTERFLY VALVE (LUG TYPE/GEAR DRIVE/WHEEL HANDLE)
	BALL VALVE
	SAFETY OR PRESSURE RELIEF VALVE
	STRAINER
	MANUAL AIR VENT
	TEST PLUG (PRESSURE/TEMPERATURE)
	RISING STEM

GENERAL NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEM AS INDICATED ON THE DRAWINGS, AS SPECIFIED, AND AS REQUIRED BY CODE.
2. BY SUBMISSION OF A BID THE CONTRACTOR ACKNOWLEDGES THAT HE UNDERSTANDS THE COMPLETE SCOPE OF WORK, HAS READ ALL OF THE PLANS AND SPECIFICATIONS, HAS PERFORMED DUE DILIGENCE BY CHECKING IN DETAIL THE EXISTING CONDITIONS AND HAS BROUGHT TO THE ATTENTION OF THE DESIGN TEAM ANY DISCREPANCIES BETWEEN THE PLANS AND EXISTING CONDITIONS THAT ARE NOT OF AN UNFORESEEN CONDITION.
3. THE PLANS ARE DIAGRAMMATIC ONLY AND ARE INTENDED TO SHOW ONLY THE GENERAL ARRANGEMENT OF EQUIPMENT AND PIPING AS THEY RELATE TO GENERAL BUILDING CONDITIONS. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE THE WORK TO AVOID CONFLICTS WITH ALL TRADES. THIS MAY ENTAIL SHIFTING EQUIPMENT, PIPING, ETC. AND/OR ADDING FITTING/OFFSETS TO MEET JOB CONDITIONS.
4. GENERAL ARRANGEMENT OF MECHANICAL EQUIPMENT, PIPING, AND CLEARANCES ETC., IS BASED UPON SPECIFIED EQUIPMENT. SUBSTITUTIONS OF EQUIPMENT WILL RESULT IN DIMENSIONAL AND PIPING ARRANGEMENT CHANGES FROM THAT SHOWN ON CONTRACT DOCUMENTS. DIMENSIONS ARE SHOWN FOR BIDDING PURPOSES ONLY. FINAL DIMENSIONS WILL BE ESTABLISHED BY THE CONTRACTOR DURING THE SHOP DRAWINGS PHASE AND UPON SUBMISSION OF CONSTRUCTION ARRANGEMENT DRAWINGS FOR APPROVAL.
5. EXAMINE NOT ONLY THE PLANS AND SPECIFICATIONS FOR THIS DIVISION, BUT PLANS AND SPECIFICATIONS OF THE OTHER DIVISIONS OF WORK AND VISIT THE SITE TO BECOME ACQUAINTED WITH EXISTING CONDITIONS. EXECUTION OF CONTRACT IS EVIDENCE THAT CONTRACTOR HAS EXAMINED ALL DRAWINGS AND SPECIFICATIONS, AND THAT ALL CONDITIONS WHICH HAVE A BEARING IN ANY WAY ON THE MANNER OF INSTALLING THE WORK IN THIS DIVISION ARE KNOWN. LATER CLAIMS FOR LABOR AND MATERIAL REQUIRED DUE TO DIFFICULTIES ENCOUNTERED, WHICH COULD HAVE BEEN FORESEEN HAD EXAMINATION BEEN MADE, WILL NOT BE RECOGNIZED.
6. ALL CONTRACTORS ON THIS PROJECT (GENERAL, MECHANICAL, ELECTRICAL, CONTROLS, MASON, ETC.) SHALL WORK TOGETHER IN A COLLABORATIVE EFFORT TO COORDINATE EACH DISCIPLINES MATERIAL AND THEIR LOCATION THROUGHOUT THE BUILDING AND SITE. THIS COORDINATION TO INCLUDE (BUT NOT LIMITED TO) THE ROUTING, LOCATION, HEIGHT, DEPTH (ETC.) OF PIPING/CONDUIT/VALVES AS IT RELATES TO FOOTINGS, COLUMNS, BEAMS, JOISTS, WALLS, EQUIPMENT (ETC.) AS WELL AS EACH OTHERS RESPECTIVE TRADE. A COMPLETE SHOP DRAWING SHOWING THESE COORDINATION EFFORTS SHALL BE PRODUCED AND PROVIDED DURING THE SUBMITTAL PHASE OF THE PROJECT. FAILURE TO PRODUCE SAID DOCUMENTS DOES NOT RELIEVE THE CONTRACTOR(S) OF THEIR REQUIRED COORDINATION EFFORTS. FAILURE TO COORDINATE DURING THE COURSE OF THE PROJECT (SPECIFICALLY AT CRITICAL STAGES) WILL NOT RESULT IN A CHANGE ORDER BEING ISSUED IF CONFLICTS BETWEEN TRADES ARISE. ANY PIPING/CONDUIT/EQUIPMENT BEING RELOCATED DUE TO CLEARANCE VIOLATIONS OR CONFLICTS BETWEEN TRADES WILL BE AT THE RESPECTIVE CONTRACTOR(S) EXPENSE.
7. CONTRACTOR SHALL PAY ALL SERVICES AND CONNECTION CHARGES AND SHALL VERIFY EXACT LOCATION OF UTILITIES, INVERT ELEVATIONS, ETC.. PRIOR TO BEGINNING ANY ROUGH-IN OF SUBSURFACE WORK. COORDINATE ALL UTILITY TIE-IN REQUIREMENTS WITH RESPECTIVE UTILITIES.
8. PROVIDE MANUFACTURERS' RECOMMENDED CLEARANCE REQUIREMENTS ON ALL AC UNITS AND EQUIPMENT FOR SERVICING, CLEANING, COIL REMOVAL, AND FILTER CHANGING. LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS AND CONTROLS.
9. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH OTHER TRADES INVOLVED PRIOR TO INSTALLATION.
10. ALL EQUIPMENT, PIPING, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED, AND REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION.
11. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL PIPING TRANSITIONS AS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL PIPING DIMENSIONS BEFORE FABRICATION.
12. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
13. SCHEDULE/PHASE DEMOLITION WORK IN ADVANCE WITH OWNER'S REPRESENTATIVE. COORDINATION WITH FACILITY OPERATING HOURS AND ACCESSIBILITY TO AREAS AFFECTED BY THIS PROJECT SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
14. ALL EQUIPMENT TO BE REMOVED IS THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER'S REPRESENTATIVE BY THE CONTRACTOR. AT THE DISCRETION OF THE OWNER'S REPRESENTATIVE, ANY OR ALL OF SUCH EQUIPMENT MAY BE REFUSED AND RELEASED TO THE CONTRACTOR FOR DISPOSAL.
15. CONTRACTOR SHALL FIELD VERIFY BY MEASUREMENT THE EXACT LOCATION OF EQUIPMENT, ELECTRICAL CONDUIT, WIRING, LIGHTS, PIPING, STRUCTURE, AND OTHER CONDITIONS WHICH WILL AFFECT MECHANICAL INSTALLATION. CONTRACTOR SHALL LOCATE EQUIPMENT AND ROUTE PIPING TO AVOID CONFLICTS AND INTERFERENCES WITH STRUCTURAL, ELECTRICAL, PLUMBING, AND ARCHITECTURAL FIELD CONDITIONS.
16. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXISTING CONDITION OF ALL EQUIPMENT AFFECTED BY THIS PROJECT AND THE EXACT LOCATION OF MATERIAL TO BE REMOVED (OR RELOCATED) BEFORE DEMOLITION WORK IS STARTED. REPORT ANY INCONSISTENCIES WITH THE CONTRACT DOCUMENTS IMMEDIATELY TO THE ENGINEER. DEMOLITION WORK SHALL BE PHASED TO ACCOMPLISH
17. REPLACEMENT WITH MINIMUM DOWNTIME. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SHUT-DOWNS OR SERVICE INTERRUPTIONS WITH OWNER'S REPRESENTATIVE.

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CONSULTING ENGINEERS

UNIVERSITY OF NORTH ALABAMA
RICE AND RIVERS HALL
CHILLER AND COOLING TOWER REPLACEMENT
FLORENCE, ALABAMA

REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED No. 24557 PROFESSIONAL 05/30/19 ENGINEER SCOTT L. WINFREY

PROJECT #	19-002
FILE NAME:	19002-M-1
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL - NOTES, LEGEND, ABBREVIATIONS, & SYMBOLS

SHEET NUMBER
M-1
OF
10

CENTRIFUGAL WATER-COOLED CHILLER SCHEDULE

CH – –

				EVAPORATOR							CONDENSER							ELECTRICAL						
MARK	NET CAP. TONS	KW/TON	FULL LOAD SOUND PRESSURE (dBA)	GPM	EWT	LWT	PASSES	FOULING	MAX. ΔP (FT. H_2O)	SHELL	GPM	EWT	LWT	PASSES	FOULING	MAX. ΔP (FT. H_2O)	SHELL	VOLTAGE	RLA	MCA	MOCP	WEIGHT (LB)	ACCESSORIES	BASIS OF DESIGN
CH-1	375	0.5399	79.3	900	54°F	44°F	2	0.0001	15'	040A	1100	85°F	95°F	2	0.00025	12'	040A	460-3ø	273	339	600	17,200	(A)(B)(C)(D)(E)	TRANE HDWA0400

ACCESSORIES:
- (A) UNIT MOUNTED STARTER WITH CIRCUIT BREAKER
- (B) VICTAULIC CONNECTIONS
- (C) REFRIGERANT MONITOR W/ SINGLE SCBA STATION
- (D) FACTORY APPLIED INSULATION
- (E) ADAPTIVIEW CONTROL INTERFACE (OPEN PROTOCOL TO COMMUNICATE WITH ANDOVER)

NOTE:
BASIS OF DESIGN CHILLER INDICATES MAXIMUM DIMENSION(S) ACCEPTABLE.

PUMP SCHEDULE

CWP – | CHWP – | HWP –

MARK	TYPE	SERVICE	GPM	T.D.H.	SUCTION SIZE (IN.)	DISCHARGE SIZE (IN.)	MIN. EFF.%	H.P.	RPM	FRAME	VOLTAGE	ACCESSORIES	BASIS OF DESIGN
CWP-1	1	CONDENSER WATER	1100	60'	6"	5"	80	20	1800	256T	460-3ø	(A)(B)(C)	B&G e-1510 5BD
CHWP-1	1	CHILLED WATER	900	75'	6"	5"	80	25	1800	284T	460-3ø	(A)(B)(C)	B&G e-1510 5EB
HWP-1	1	HOT WATER	800	75'	6"	5"	80	25	1800	284T	460-3ø	(A)(B)(C)	B&G e-1510 5EB

TYPE:
- 1 BASE MOUNTED; END SUCTION

ACCESSORIES:
- (A) SUCTION DIFFUSER W/ STRAINER
- (B) TRIPLE DUTY VALVE
- (C) O.D.P. MOTOR (HIGH EFF.)/INVERTER RATED

MOTOR CONTROLLER SCHEDULE

MARK	TYPE	SERVICE	VOLTAGE	H.P.	ACCESSORIES	ENCLOSURE
CWP-1	1	CONDENSER WATER PUMP	460-3ø	20	(A)(B)(C)	NEMA 1
CHWP-1	2	CHILLED WATER PUMP	460-3ø	25	(D)(E)	NEMA 1
HWP-1	2	HOT WATER PUMP	460-3ø	25	(D)(E)	NEMA 1
CT-1	2	COOLING TOWER FAN	460-3ø	25	(D)(E)	NEMA 3R

TYPE:
- 1 ACROSS LINE COMBINATION MAGNETIC
- 2 VARIABLE FREQUENCY DRIVE

ACCESSORIES:
- (A) HOA IN COVER
- (B) PILOT LIGHT IN COVER
- (C) CONTROL CIRCUIT TRANSFORMER
- (D) BYPASS
- (E) INTEGRAL DISCONNECT

FAN SCHEDULE

EF –

MARK	TYPE	AIRFLOW (CFM)	STATIC PRESSURE (IN. WC.)	MAX SONES	MOTOR HP	VOLTAGE	WALL OPENING	WEIGHT (#)	ACCESSORIES	BASIS OF DESIGN
EF-1	1	3,000	0.5"	18	3/4	120-1ø	23.5" X 23.5"	75	(A)(B)(C)	GREENHECK AER-E20C-620-VG

TYPE:
- 1 WALL MOUNTED; PROPELLER

ACCESSORIES:
- (A) BACKDRAFT DAMPER (MOTORIZED; 120-1ø)
- (B) MOTOR/FAN GUARD
- (C) ECM (VARIABLE SPEED) MOTOR

COOLING TOWER SCHEDULE

CT – –

MARK	TYPE	SERVICE	OAWB	GPM	EWT	LWT	HP	VOLTAGE	OPERATION WEIGHT (LB)	ACCESSORIES	BASIS OF DESIGN
CT-1	1	CHILLER CH-1	78°F	1100	95°F	85°F	25	460-3ø	16,100	(A)(B)(C)(D)(E)(F)(G)(H)(I)(J)	BAC S3E-8518-06N

TYPE:
- 1 INDUCED DRAFT; CROSSFLOW

ACCESSORIES:
- (A) MAKE-UP WATER VALVE
- (B) INVERTER RATED MOTOR (TEAO)
- (C) VIBRATION CUTOUT SWITCH
- (D) EXTERNAL MOUNTED TERMINAL BOX
- (E) STAINLESS STEEL BASIN
- (F) EASY CONNECT PIPING CONNECTION
- (G) INTERNAL WALKWAY
- (H) VARIABLE FREQUENCY DRIVE (NEMA 3R)
- (I) ALUMINUM LADDER/SAFETY CAGE/PERIMETER HANDRAILS
- (J) EXTENDED BEARING LUBE LINES

EXPANSION TANK SCHEDULE

ET – –

MARK	TYPE	SYSTEM PRESSURE MIN. (PSI)	SYSTEM PRESSURE MAX. (PSI)	SYSTEM TEMP. MIN. (°F)	SYSTEM TEMP. MAX. (°F)	TANK DIMENSIONS (IN.) DIA.	TANK DIMENSIONS (IN.) H	CAPACITY VOLUME (GAL.)	CAPACITY ACCEPTANCE (GAL.)	WEIGHT (#)	ACCESSORIES	BASIS OF DESIGN
ET-1	1	55	80	40°F	80°F	16"	45"	34	11	390	(A)	B&G D-60V
ET-2	1	55	80	55°F	190°F	30"	60"	159	56	1800	(A)	B&G D-260V

TYPE:
- 1 DIAPHRAGM; PRE-CHARGED

ACCESSORIES:
- (A) TANK PURGE VALVE (TPV)

PIPE INSULATION SCHEDULE

DESCRIPTION	PIPE SIZE (INCHES)	INSULATION THICKNESS (INCHES)	INSULATION TYPE	JACKET TYPE	REMARKS
HVAC SYSTEMS					
HOT WATER SUPPLY/RETURN (HWS/HWR)	0 TO 8"	3"	2	1	(A)
CHILLED WATER SUPPLY/RETURN (CHWS/CHWR)	0 TO 8"	2"	1	1	(A)
MAKE-UP WATER (EXTERIOR)	0 TO 2"	1"	2	1	(B)
MAKE-UP WATER (INTERIOR)	0 TO 2"	1"	2	–	

INSULATION TYPE:
- 1 CELLULAR GLASS
- 2 FIBERGLASS

JACKET TYPE:
- 1 ALUMINUM

REMARKS:
- (A) PROVIDE JACKET FOR PIPING EXPOSED IN MECHANICAL ROOM UP TO 8'-0" A.F.F.
- (B) ALL EXPOSED EXTERIOR PIPING; COVER WITH JACKET.

AIR SEPARATOR SCHEDULE

AS – –

MARK	TYPE	SERVICE	CAPACITY (GPM)	CONNECTION SIZE (IN.)	ACCESSORIES	BASIS OF DESIGN
AS-1	1	CHILLED WATER	900	8"	(A)(B)(C)	B&G R-8

TYPE:
- 1 IN-LINE; TANGENTIAL FLOW

ACCESSORIES:
- (A) FLANGED CONNECTION
- (B) STRAINER
- (C) HIGH CAPACITY AIR VENT

NOTE TO BIDDERS:

THE FOLLOWING LIST OF EQUIPMENT WILL BE OWNER PROVIDED/CONTRACTOR INSTALLED:

- CHILLER (CH-1)
- PUMPS (CWP-1, CHWP-1, HWP-1)
- COOLING TOWER (CT-1)
- EXPANSION TANKS (ET-1, ET-2)
- AIR SEPARATOR (AS-1)
- MOTOR STARTER AND VARIABLE FREQUENCY DRIVES FOR PUMPS AND COOLING TOWER

ALL OTHER EQUIPMENT NOT LISTED ABOVE IS TO BE PROVIDED BY THIS CONTRACTOR.

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CHILLER AND COOLING TOWER REPLACEMENT
FLORENCE, ALABAMA

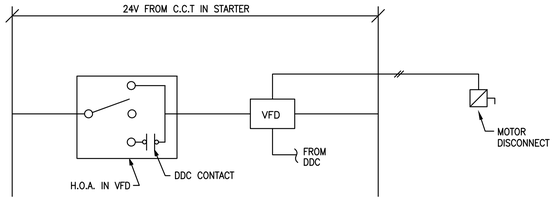
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED No. 24580 PROFESSIONAL 05/30/19 ENGINEER SCOTT L. WHITFIELD

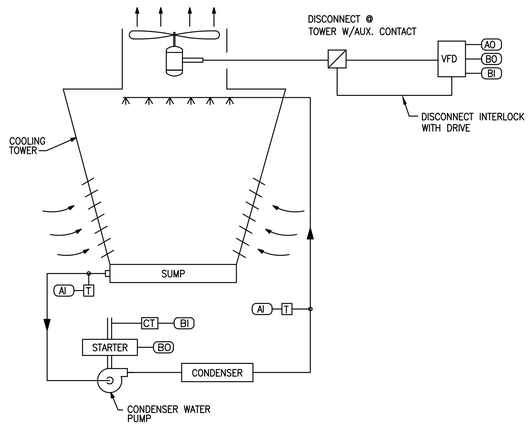
PROJECT #	19-002
FILE NAME:	19002-M-2
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL - SCHEDULES

SHEET NUMBER
M-2
OF
10



COOLING TOWER FAN WIRING



CONDENSER WATER (COOLING TOWER) CONTROL

SEQUENCE OF OPERATION:

CONDENSER WATER CONTROL SEQUENCE

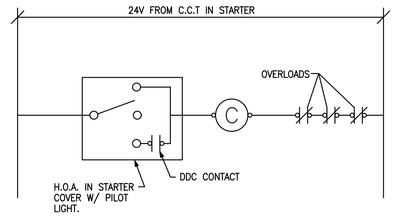
DDC ENERGIZES CONDENSER WATER PUMP CWP–1 WHEN CHILLER IS ENERGIZED.

DDC ENERGIZES COOLING TOWER FAN MOTOR CONTROLLER WHEN CHILLER IS ENERGIZED.

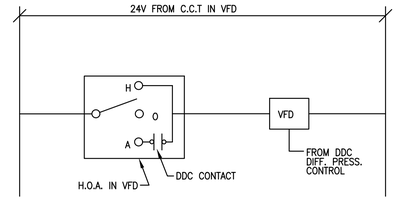
CONDENSER WATER TEMPERATURE IS CONTROLLED BY MODULATING VARIABLE FREQUENCY DRIVE CONTROLLING FAN MOTOR IN RESPONSE TO TEMPERATURE OF (85°F) WATER LEAVING TOWER.

DDC SYSTEM MONITORS ALL SYSTEM FUNCTIONS INDICATED ON DRAWINGS.

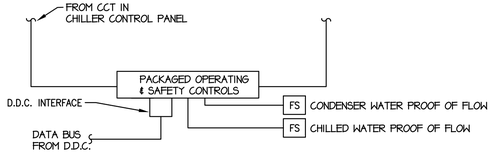
PROVIDE SYSTEM GRAPHIC INDICATING ALL POINTS INDICATED ON THE DRAWINGS AND IN THE DDC ARCHITECTURE DIAGRAM.



PUMP CWP–1 WIRING



PUMPS HWP–1 & CHWP–1 WIRING



CHILLER CH–1 CONTROL

SEQUENCE OF OPERATION:

CHILLER CONTROL SEQUENCE

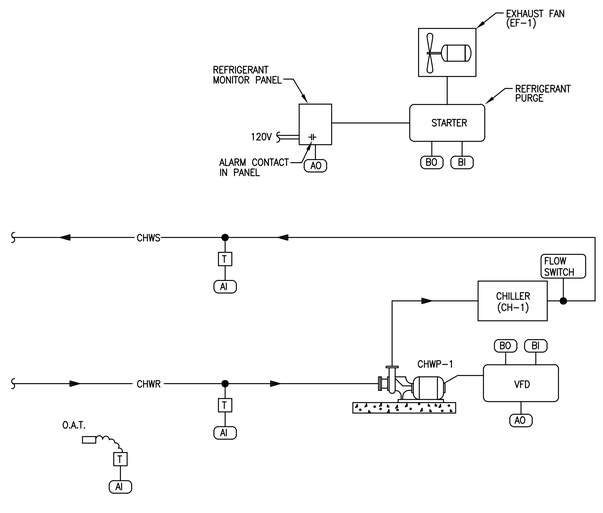
IF OUTSIDE AIR TEMPERATURE IS 55°F (ADJUSTABLE) OR ABOVE, MECHANICAL REFRIGERATION IS ENABLED.

DDC ENERGIZES CHILLER CONTROL PANEL, WHICH IN TURN ENERGIZES CHWP AND CWP. PACKAGED CHILLER OPERATING CONTROLS WILL MAINTAIN CHWS SETPOINT TEMPERATURE OF 44°F. PUMPS TO BE ENERGIZED WHENEVER MECHANICAL REFRIGERATION IS ENABLED.

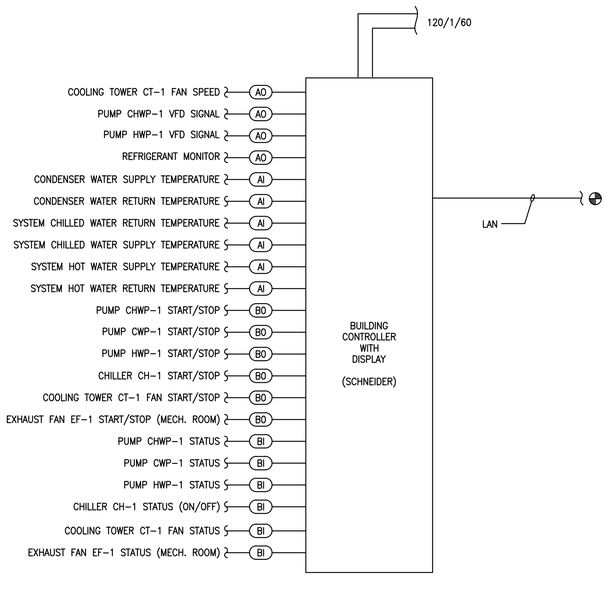
DDC PANEL PROVIDES MONITORING OF ALL CHILLER FUNCTIONS.

COOLING TOWER FAN VARIABLE FREQUENCY DRIVE (VFD) CONTROLS FAN SPEED IN RESPONSE TO CWS SETPOINT TEMPERATURE OF 85°F.

PROVIDE SYSTEM GRAPHIC FOR EACH POINT AS INDICATED ON THE SCHEMATIC DRAWINGS AND DDC ARCHITECTURE.



CHILLED WATER SYSTEM CONTROL



DDC SYSTEM ARCHITECTURE

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Suite 200
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ESI Project #: 19-002

UNIVERSITY OF NORTH ALABAMA
RICE AND RIVERS HALL
CHILLER AND COOLING TOWER REPLACEMENT
FLORENCE, ALABAMA

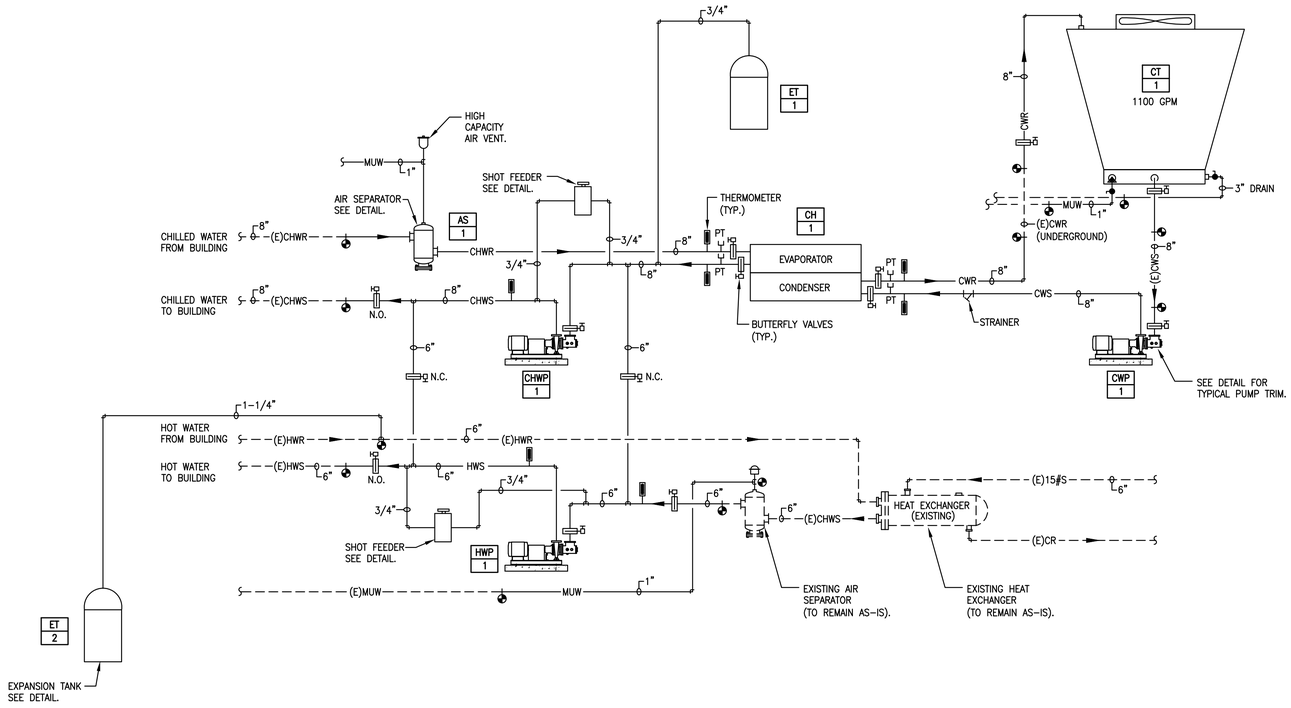
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA
No. 24564
PROFESSIONAL
05/30/19
ENGINEER
SCOTTY L. WINFREY

PROJECT #	19–002
FILE NAME:	19002–M–3
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL - CONTROLS

SHEET NUMBER
M-3
OF
10



CHILLED WATER/HOT WATER/CONDENSER WATER SYSTEM SCHEMATIC

N.T.S.

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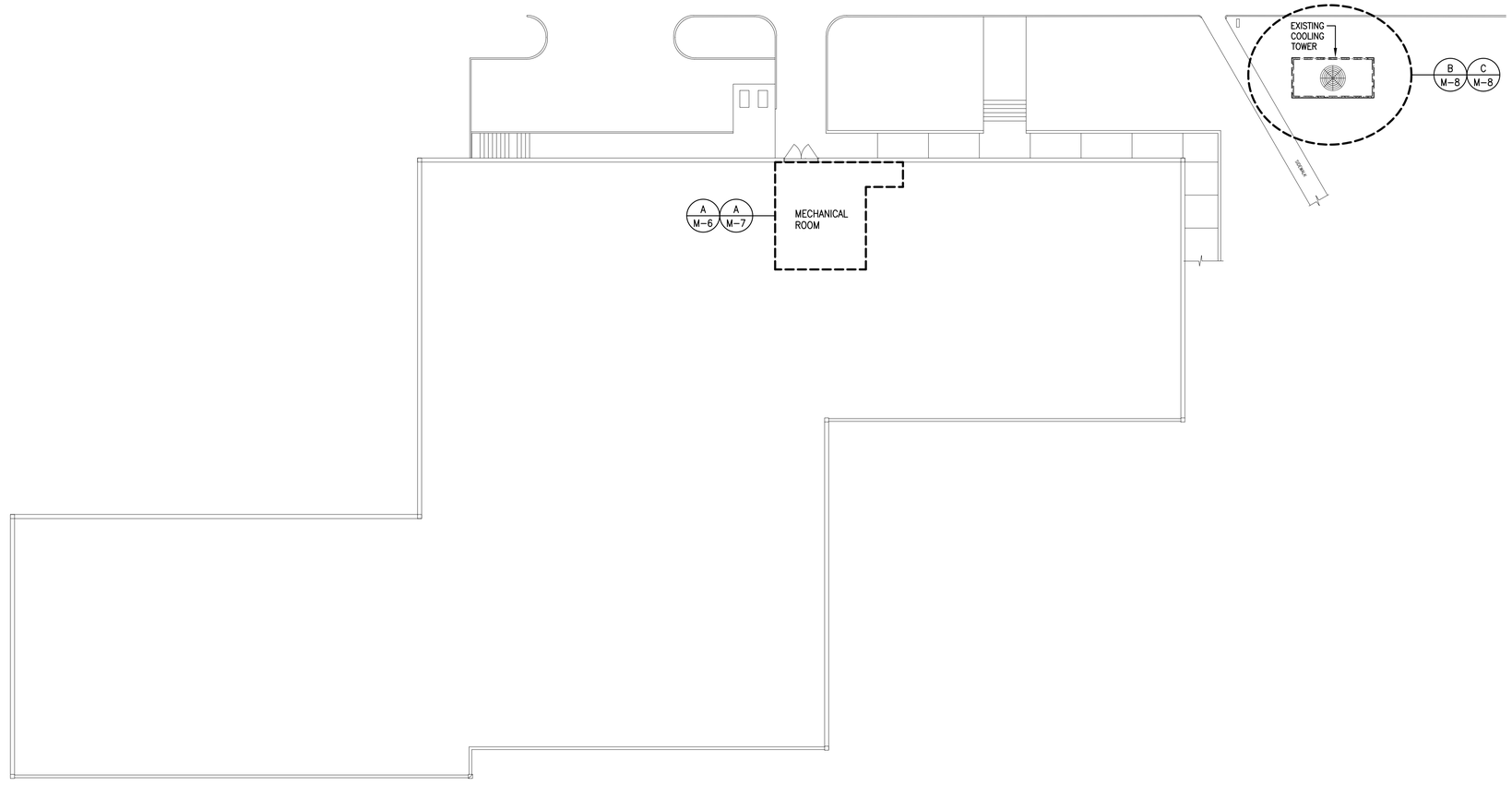
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA
No. 24557
PROFESSIONAL
05/30/19
ENGINEER
SCOTTY L. WINFREY

PROJECT #	19-002
FILE NAME:	19002-M-4
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL - SCHEMATIC

SHEET NUMBER
M-4
OF
10



MECHANICAL – SITE PLAN
SCALE: 1/16" = 1'-0"

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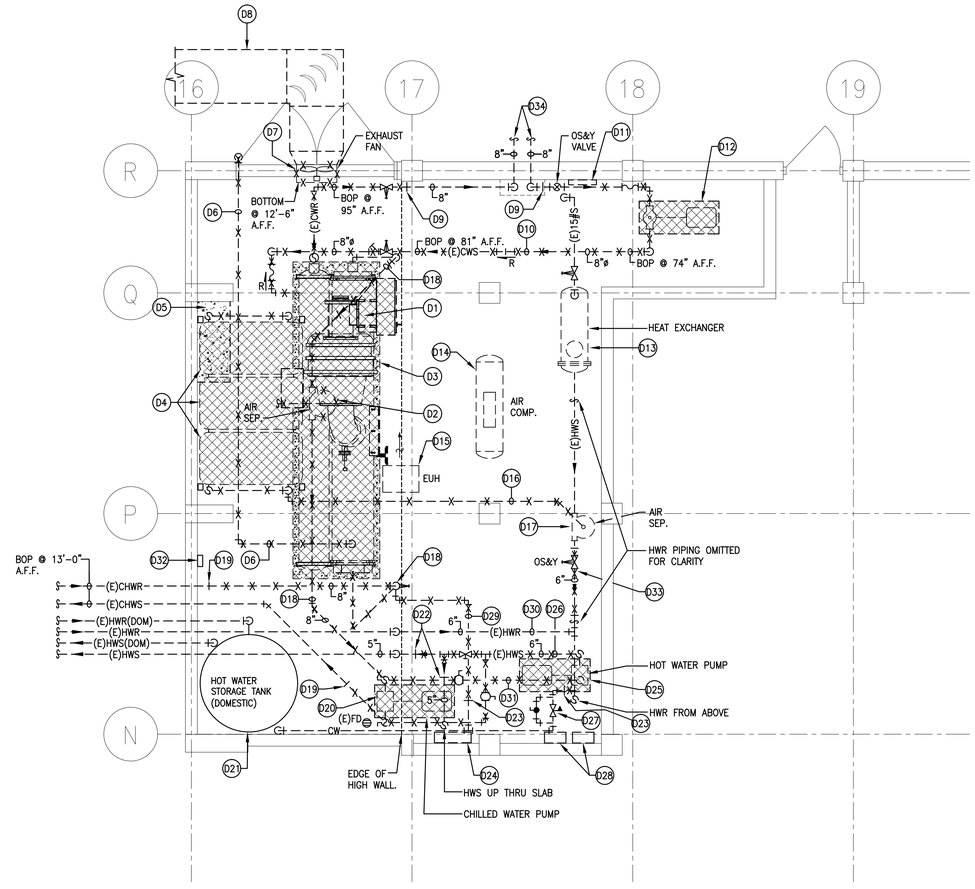
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA
No. 24567
PROFESSIONAL
05/30/19
ENGINEER
SCOTT L. WINFREY

PROJECT #	19-002
FILE NAME:	19002-M-5
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL - SITE PLAN

SHEET NUMBER
M-5
OF
10



A / M-5 MECHANICAL ROOM – DEMOLITION PLAN
SCALE: 1/4" = 1'-0"

DEMOLITION KEY NOTES:

D1 CENTRIFUGAL CHILLER AND ASSOCIATED PIPING AS INDICATED TO BE REMOVED AND DISPOSED OF. ALL REFRIGERANT TO BE RECLAIMED AND DISPOSED OF PER ASHRAE STANDARDS.

D2 AIR SEPARATOR TO BE REMOVED AND DISPOSED OF. INCLUDING HANGERS AND PIPING.

D3 CONCRETE HOUSEKEEPING PAD TO BE REMOVED AND DISPOSED OF.

D4 COMPRESSION TANKS (5 THUS) AND ASSOCIATED PIPING AND STRUCTURAL SUPPORT FRAME TO BE REMOVED AND DISPOSED OF.

D5 CONCRETE PAD TO REMAIN AND BE USED FOR EXPANSION TANK.

D6 RUPTURE DISC VENT PIPING TO BE REMOVED AND DISPOSED OF. INCLUDING HANGERS.

D7 EXHAUST FAN TO BE REMOVED AND DISPOSED OF.

D8 EXHAUST DUCT TO REMAIN AND BE RE-USED.

D9 CONDENSER WATER RETURN PIPING TO BE REMOVED BACK TO THIS POINT OF RECONNECTION.

D10 CONDENSER WATER SUPPLY PIPING TO BE REMOVED AND DISPOSED OF.

D11 COOLING TOWER CHEMICAL TREATMENT FEED SYSTEM TO REMAIN AND BE RE-USED/RE-CONNECTED.

D12 CONDENSER WATER PUMP TO BE REMOVED AND DISPOSED OF.

D13 STEAM TO HOT WATER HEAT EXCHANGER TO REMAIN (NO WORK ON THIS SYSTEM).

D14 AIR COMPRESSOR TO REMAIN.

D15 ELECTRIC UNIT HEATER TO REMAIN.

D16 COMPRESSION TANK PIPING TO AIR SEPARATOR TO BE REMOVED AND DISPOSED OF.

D17 AIR SEPARATOR TO REMAIN.

D18 CHILLED WATER SUPPLY/RETURN PIPING TO BE REMOVED AND DISPOSED OF.

D19 CHILLED WATER PIPING TO BE REMOVED BACK TO THIS POINT OF RECONNECTION.

D20 CHILLED WATER PUMP TO BE REMOVED AND DISPOSED OF.

D21 DOMESTIC HOT WATER STORAGE TANK TO REMAIN.

D22 HOT WATER PIPING TO REMOVED BACK TO THIS POINT OF RECONNECTION.

D23 MAKEUP WATER PIPING TO BE REMOVED BACK TO THIS POINT OF RECONNECTION.

D24 ABANDONED CONTROL PANEL ENCLOSURE TO REMAIN.

D25 HOT WATER PUMP TO BE REMOVED AND DISPOSED OF.

D26 HOT WATER SUPPLY PIPING TO BE REMOVED AND DISPOSED OF.

D27 MAKEUP WATER PRESSURE REDUCING VALVE AND BYPASS TO REMAIN FOR HOT WATER SYSTEM.

D28 DDC CONTROL PANEL ENCLOSURE TO REMAIN AND BE REUSED.

D29 MAKEUP WATER PIPING TO BE REMOVED AND DISPOSED OF.

D30 HOT WATER RETURN PIPING TO REMAIN. PROTECT INSULATION DURING DEMO AND CONSTRUCTION.

D31 BYPASS LINE CONNECTING PUMPS TOGETHER FOR EMERGENCY FLOW TO BE REMOVED AND DISPOSED OF.

D32 DOMESTIC HOT WATER TEMPERATURE SENSOR CONTROLLER TO BE RELOCATED. SEE SHEET M-7.

D33 OS&Y SHUTOFF VALVE ON HOT WATER SUPPLY TO BE REMOVED AND DISPOSED OF.

D34 CONDENSER WATER SUPPLY/RETURN PIPING TO/FROM COOLING TOWER TO REMAIN.

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CHILLER AND COOLING TOWER REPLACEMENT
FLORENCE, ALABAMA

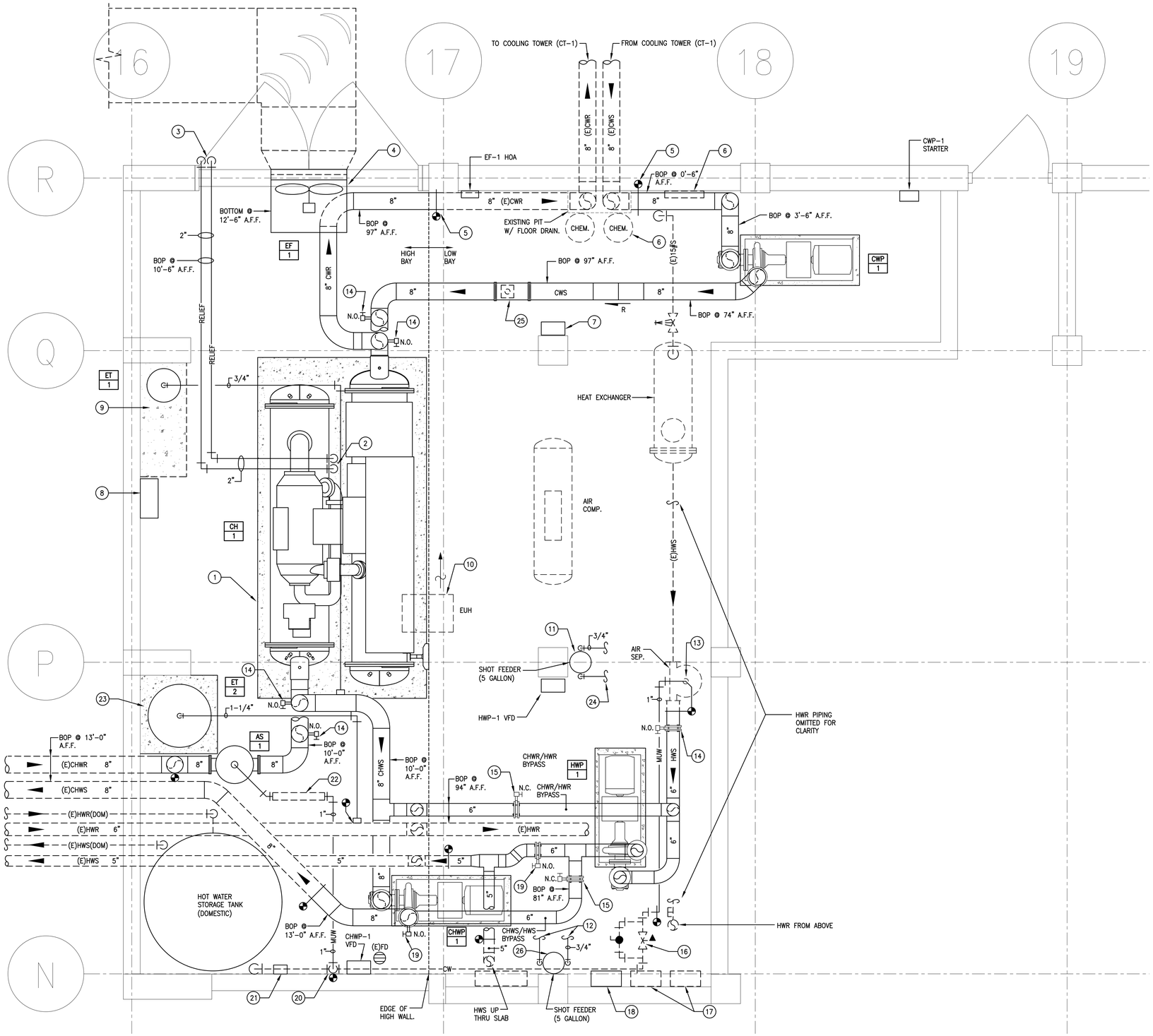
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED No. 24654 PROFESSIONAL 05/30/19 ENGINEER SCOTTY L. WINFREE

PROJECT #	19-002
FILE NAME:	19002-M-6
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL ROOM - DEMOLITION PLAN

SHEET NUMBER
M-6
OF
10



A M-5 MECHANICAL ROOM – FLOOR PLAN
SCALE: 1/2" = 1'-0"

KEY NOTES:

1. PROVIDE NEW 4" HIGH CONCRETE PAD FOR CHILLER (CH-1). 3000# CONCRETE WITH 1.5#/CU. YD. OF FIBER REINFORCING.
2. 2" SCHEDULE 40 STEEL PIPING FOR CONDENSER/EVAPORATOR PRESSURE RELIEF VALVES.
3. REUSE EXISTING PENETRATION THRU WALL AND ENLARGE AS REQUIRED FOR NEW PIPING. PENETRATION TO BE SEALED. CUT ON 45 DEG. AND COVER WITH 1/4" MESH WIRE.
4. EXHAUST FAN TO BE MOUNTED WHERE FAN WAS REMOVED. FILL IN OPENING FOR NEW FAN DIMENSION AS REQUIRED FOR RIGID MOUNTING.
5. RECONNECT NEW CONDENSER WATER RETURN/SUPPLY PIPING TO EXISTING AT APPROXIMATELY THIS LOCATION.
6. COOLING TOWER CHEMICAL TREATMENT SYSTEM TO BE RECONNECTED TO NEW PIPING. COORDINATE WITH WATER TREATMENT CONTRACTOR.
7. MOUNT SELF-CONTAINED BREATHING APPARATUS (SCBA) ON COLUMN.
8. REFRIGERANT MONITOR TO BE MOUNTED ACCESSIBLE ON WALL. PROVIDE WITH 120-1ø POWER.
9. EXISTING CONCRETE PAD TO BE REUSED FOR EXPANSION TANK MOUNTING. SECURE TANK TO WALL.
10. ELECTRIC UNIT HEATER TO REMAIN IN THIS LOCATION.
11. SHOT FEEDER FOR HOT WATER SYSTEM.
12. 3/4" PIPING TO/FROM CHILLED WATER SYSTEM TO SERVE SHOT FEEDER.
13. CONNECT 1" MAKEUP WATER (MUW) LINE TO EXISTING AIR SEPARATOR.
14. NEW 6" BUTTERFLY VALVE (TYP). LUG STYLE. NIBCO LD-2000-5 OR APPROVED EQUAL.
15. BUTTERFLY VALVES NORMALLY CLOSED (N.C.) FOR MANUAL BYPASS OPERATION IN CASE OF PUMP FAILURE. SEE PIPING SCHEMATIC SHEET M-4. NIBCO LD-2000-5 OR APPROVED EQUAL.
16. RECONNECT NEW MAKEUP WATER LINE DOWNSTREAM OF EXISTING PRESSURE REDUCING VALVE FOR HOT WATER SYSTEM.
17. EXISTING DDC CONTROLLER ENCLOSURE TO REMAIN AND BE REUSED.
18. NEW DDC CONTROL PANEL (120-1) FOR PLANT OPERATION. CONNECT INTO EXISTING SCHNEIDER SYSTEM.
19. BUTTERFLY VALVES NORMALLY OPEN (N.O.) FOR MANUAL BYPASS OPERATION IN CASE OF PUMP FAILURE. SEE PIPING SCHEMATIC SHEET M-4. NIBCO LD-2000-5 OR APPROVED EQUAL.
20. CONNECT NEW MAKEUP WATER LINE TO EXISTING COLD WATER FEED LINE.
21. RELOCATED DOMESTIC HOT WATER TEMPERATURE SENSOR CONTROLLER.
22. MAKEUP WATER PRESSURE REDUCING VALVE, BYPASS, BFP, ETC. FOR CHILLED WATER SYSTEM. SEE DETAIL SHEET M-9.
23. PROVIDE NEW 4" HIGH CONCRETE PAD FOR EXPANSION TANK. 3000# CONCRETE WITH 1.5#/CU. YD. OF FIBER REINFORCING.
24. 3/4" PIPING TO/FROM HOT WATER SYSTEM TO SERVE SHOT FEEDER.
25. FLANGED END Y-STRAINER. HOFFMAN 450C OR APPROVED EQUAL.
26. SHOT FEEDER FOR CHILLED WATER SYSTEM.

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ESI Project #: 19-002

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RICE AND RIVERS HALL
CHILLER AND COOLING TOWER REPLACEMENT
FLORENCE, ALABAMA

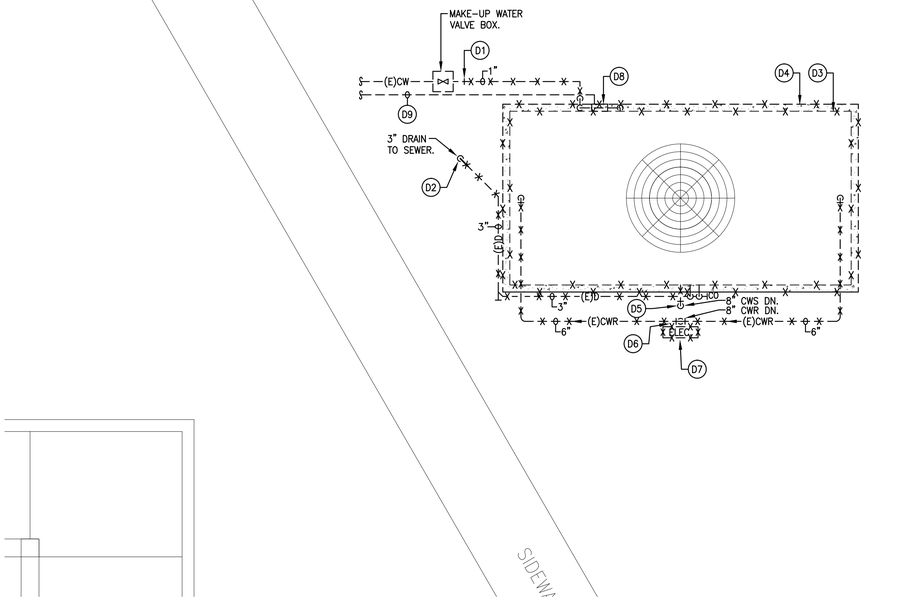
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA
No. 24564
PROFESSIONAL
05/30/19
ENGINEER
SCOTTY L. WINFREY

PROJECT #	19-002
FILE NAME:	19002-M-7
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL ROOM - FLOOR PLAN

SHEET NUMBER
M-7
OF
10



B
M-5

PARTIAL SITE PLAN – DEMOLITION

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

DEMOLITION KEY NOTES:

(D1) 1" MAKEUP WATER LINE TO BE REMOVED BACK TO THIS POINT OF RECONNECTION.

(D2) 3" SANITARY SEWER DRAIN TO BE REMOVED BACK TO THIS POINT OF RECONNECTION.

(D3) COOLING TOWER TO BE REMOVED AND DISPOSED OF.

(D4) CONCRETE PAD TO BE REMOVED AND DISPOSED OF.

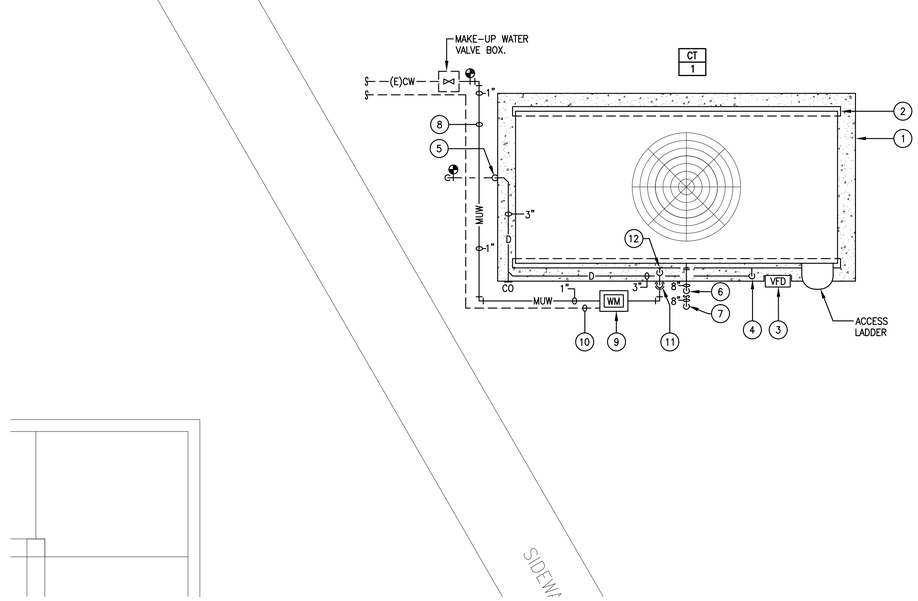
(D5) 8" CONDENSER WATER SUPPLY PIPING TO BE REMOVED TO APPROXIMATELY 1'-6" ABOVE GRADE. RECONNECT NEW PIPING AT THIS POINT.

(D6) 8" CONDENSER WATER RETURN PIPING TO BE REMOVED TO APPROXIMATELY 1'-6" ABOVE GRADE. RECONNECT NEW PIPING AT THIS POINT.

(D7) ELECTRICAL DISCONNECT/STARTER TO BE REMOVED AND DISPOSED OF. SEE ELECTRICAL DRAWINGS FOR DETAILS.

(D8) CHEMICAL TREATMENT WATER METER TO BE REMOVED AND STORED UNTIL RE-INSTALLATION IN A DIFFERENT LOCATION.

(D9) CONTROL/SIGNAL WIRING FOR CHEMICAL TREATMENT WATER METER. WIRING TO BE PROTECTED DURING CONSTRUCTION.



C
M-5

PARTIAL SITE PLAN

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

KEY NOTES:

(1) PROVIDE NEW 12" THICK CONCRETE PAD FOR COOLING TOWER. PAD TO EXTEND BEYOND TOWER 12". EDGE TO BE CHAMFERED. ADJUST GRADE AS REQUIRED FOR LEVEL PAD.

(2) I-BEAM SUPPORT FOR COOLING TOWER MOUNTING. SEE DETAIL ON SHEET M-10.

(3) COOLING TOWER FAN VARIABLE FREQUENCY DRIVE (VFD) MOUNTED ON STAINLESS STEEL UNISTRUT FRAME INDEPENDENT OF TOWER. ATTACH TO CONCRETE PAD. SEE ALSO ELECTRICAL NOTES AND DETAILS.

(4) 3" OVERFLOW DRAIN AND 2" MAIN DRAIN CONNECTION. PIPE TO EXISTING SANITARY SEWER. SUPPORT PIPING WITH STAINLESS STEEL UNISTRUT AND CLAMPS ALONG CONCRETE PAD.

(5) DROP 3" DRAIN PIPING DOWN TIGHT TO PAD AND UNDERGROUND OVER TO EXISTING 3" PIPING.

(6) 8" CONDENSER WATER SUPPLY. CONNECT AT APPROXIMATELY 1'-6" ABOVE GRADE AND EXTEND TO INLET CONNECTION ON COOLING TOWER. PROVIDE BUTTERFLY VALVE FOR SHUTOFF/ISOLATION. LUG STYLE NIBCO LD-2000-5 OR APPROVED EQUAL.

(7) 8" CONDENSER WATER RETURN. CONNECT AT APPROXIMATELY 1'-6" ABOVE GRADE AND EXTEND TO OUTLET CONNECTION ON COOLING TOWER. PROVIDE BUTTERFLY VALVE FOR SHUTOFF/ISOLATION. LUG STYLE NIBCO LD-2000-5 OR APPROVED EQUAL.

(8) ROUTE NEW 1" MAKEUP WATER PIPING UNDERGROUND.

(9) PROVIDE CAST IRON VALVE BOX WITH HEAVY DUTY LID FOR MOUNTING CHEMICAL TREATMENT WATER METER. PROVIDE WITH 1" TEE AND DRAIN VALVE (N.C.) UPSTREAM OF WATER METER FOR WINTER DRAIN DOWN.

(10) CONTROL/SIGNAL WIRING FOR CHEMICAL TREATMENT WATER METER. EXTEND TO EXISTING AND SPLICE AS REQUIRED.

(11) PROVIDE STEEL SLEEVE FOR 1" MAKEUP WATER TIGHT TO CONCRETE SLAB.

(12) 1" MAKEUP WATER SUPPLY. EXTEND TO INLET CONNECTION ON COOLING TOWER.

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CHILLER AND COOLING TOWER
REPLACEMENT
FLORENCE, ALABAMA

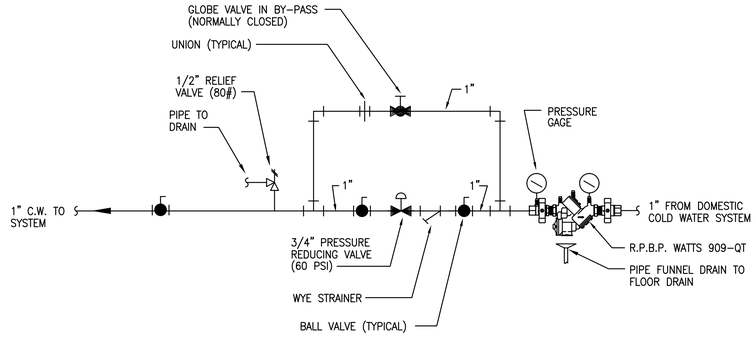
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA
No. 24567
PROFESSIONAL
05/30/19
ENGINEER
SCOTTY L. WINFREY

PROJECT #	19-002
FILE NAME:	19002-M-8
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

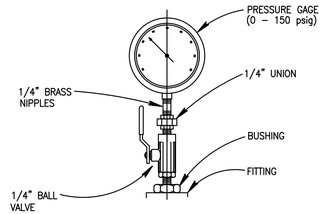
MECHANICAL - PARTIAL DEMOLITION SITE PLAN & SITE PLAN

SHEET NUMBER
M-8
OF
10



COLD WATER MAKE - UP

NO SCALE



PRESSURE GAGE

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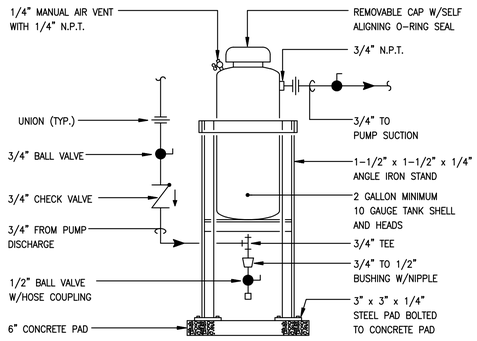
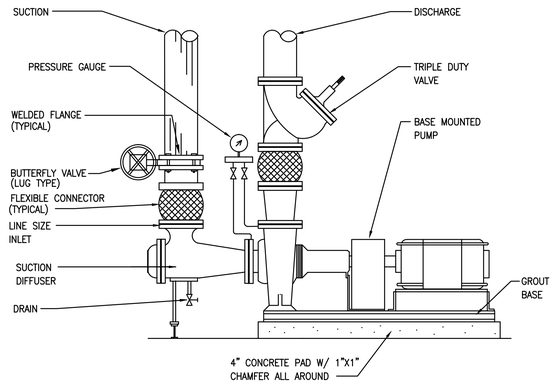


WATER TREATMENT ONE SHOT FEEDER DETAIL

NO SCALE



END SUCTION PUMP

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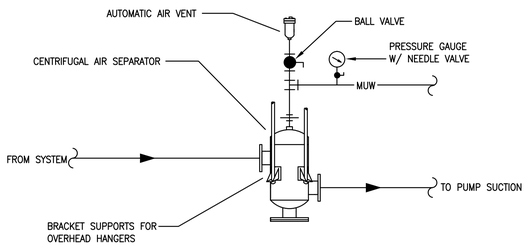

AIR SEPARATOR DETAIL

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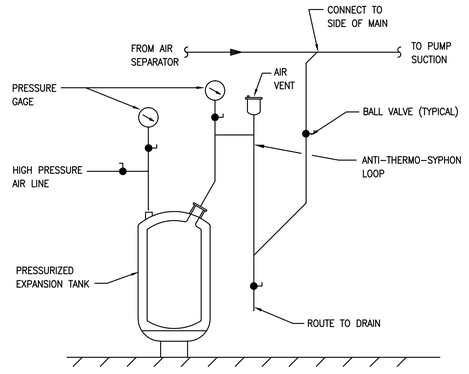

BLADDER TYPE EXPANSION TANK

NO SCALE

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FLORENCE, ALABAMA

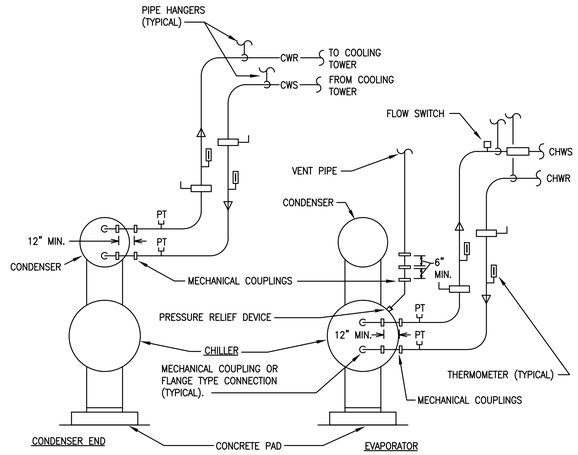
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED No. 16037 PROFESSIONAL ENGINEER 05/30/19 SCOTT L. WINFREE

PROJECT #	19-002
FILE NAME:	18028-M-9
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL - DETAILS

SHEET NUMBER
M-9
OF
10

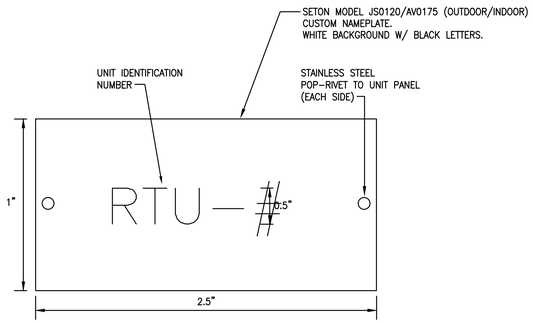


NOTES:

1. DRAIN ALL LOW POINTS OF SYSTEMS TO NEAREST FLOOR DRAIN.
2. PROVIDE ADDITIONAL MECHANICAL COUPLINGS OR FLANGED CONNECTIONS IF MECHANICAL COUPLING ARE NOT USED AS REQUIRED TO REMOVE A MINIMUM AMOUNT OF PIPING FOR REMOVAL OF TUBES AND/OR CHILLER.
3. VENT PIPES FROM ALL REFRIGERANT SAFETY RELIEF DEVICES SHALL EXTEND TO EXTERIOR OF BUILDING IN ACCORDANCE WITH ANSI B-9.1.

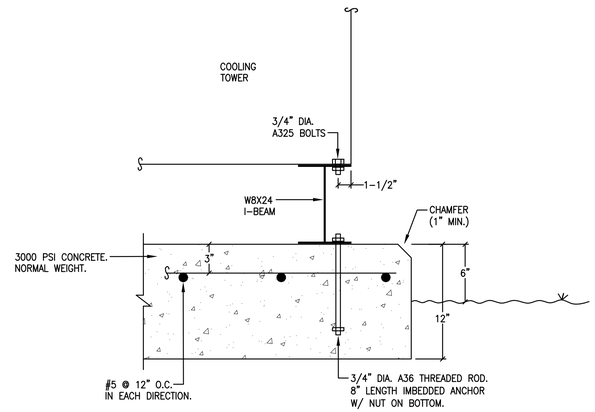
TYPICAL CONNECTIONS TO CONDENSER & CHILLER

NO SCALE



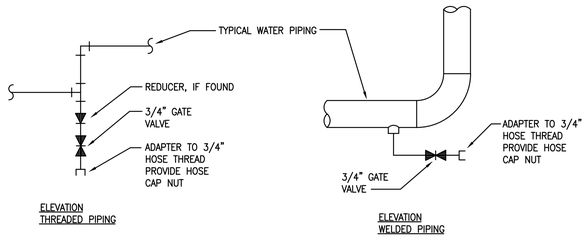
IDENTIFICATION NAMEPLATE DETAIL

NO SCALE



COOLING TOWER PAD/MOUNTING DETAIL

NO SCALE

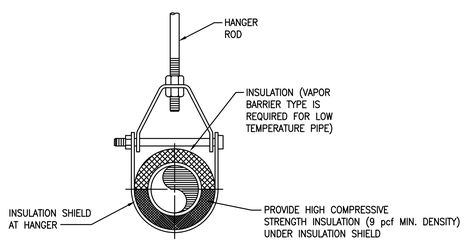


NOTES:

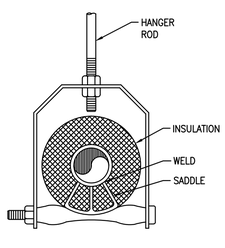
1. DRAIN ALL LOW POINTS AS INDICATED ABOVE.
2. WHERE SCALE POCKETS ARE SHOWN ON PIPE RISER DIAGRAMS AND/OR PLANS LOCATE DRAIN AT BOTTOM OF SCALE POCKET.

TYPICAL DRAIN VALVE CONNECTION

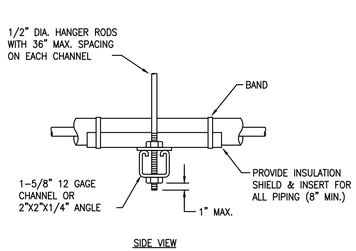
NO SCALE



ADJUSTABLE CLEVIS HANGER TYPE 1 IN SPECIFICATIONS



ADJUSTABLE ROLLER HANGER TYPE 43 IN SPECIFICATION

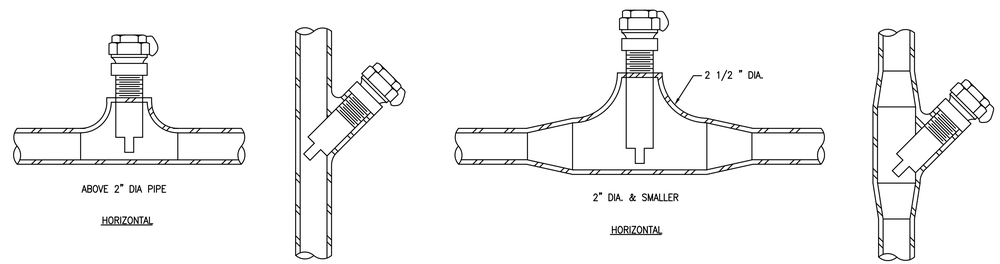


SIDE VIEW
TRAPEZE HANGER FOR UP TO 1000 LB. UNIFORM LOAD

NOM. SIZE	THRU 3/4"	1	1-1/4	1-1/2	2	2-1/2	3	4	5	6	8
PIPE	7 FT	7	7	9	10	11	12	14	16	17	19
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.											

TYPICAL PIPE HANGERS

NO SCALE



INSTALLATION OF THERMOMETER WELLS

NO SCALE

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FLORENCE, ALABAMA

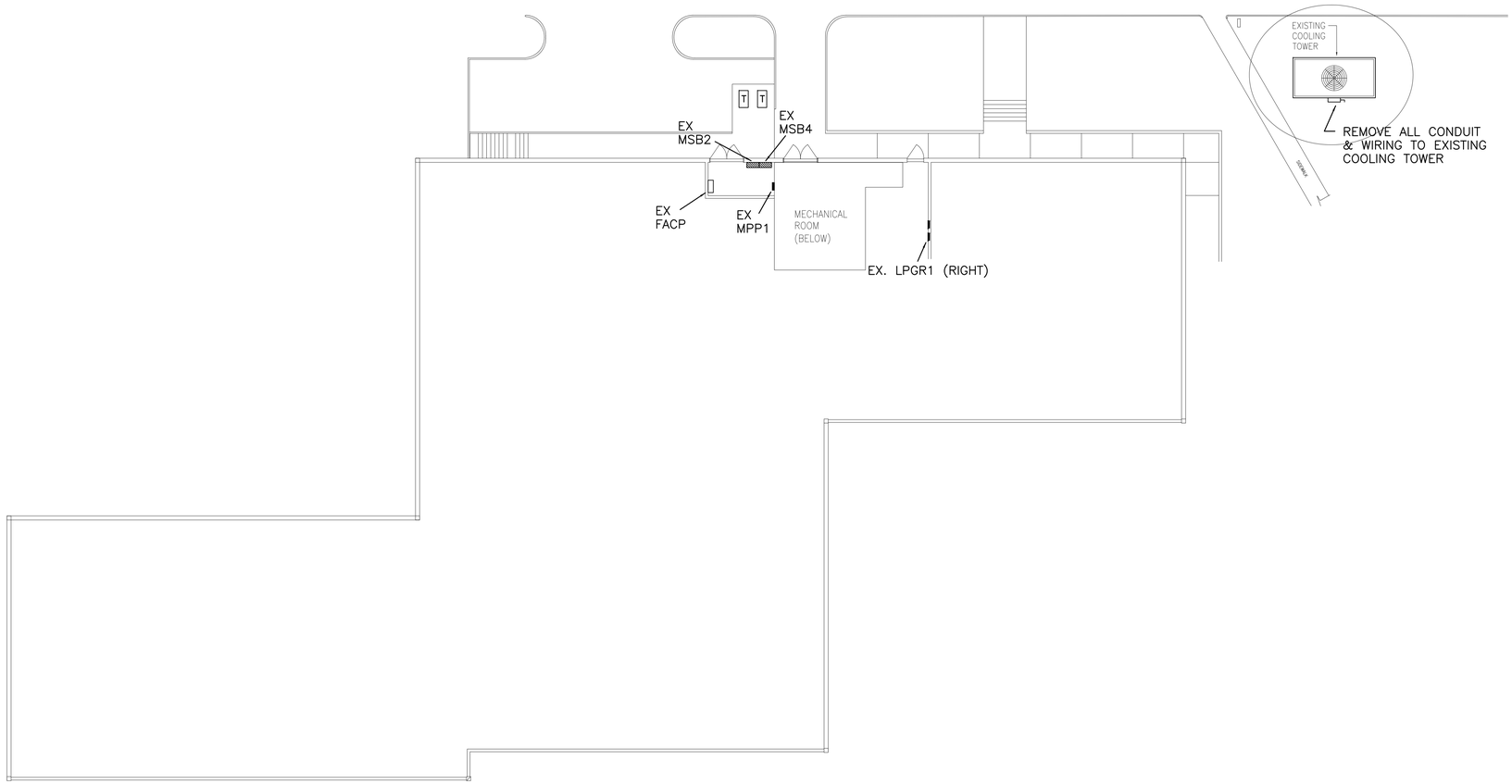
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED PROFESSIONAL ENGINEER
No. 24580
05/30/19
SCOTT L. WHITFIELD

PROJECT #	19-002
FILE NAME:	19002-M-10
DATE:	05/30/19
DRAWN BY:	CKM/TAK
CHECKED BY:	SLW

MECHANICAL - DETAILS

SHEET NUMBER
M-10
OF
10



ELECTRICAL SITE PLAN

SCALE: 1/16" = 1'-0"

16' 0 16' 32'

GRAPHIC SCALE
1/16"=1'-0"

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FLORENCE, ALABAMA

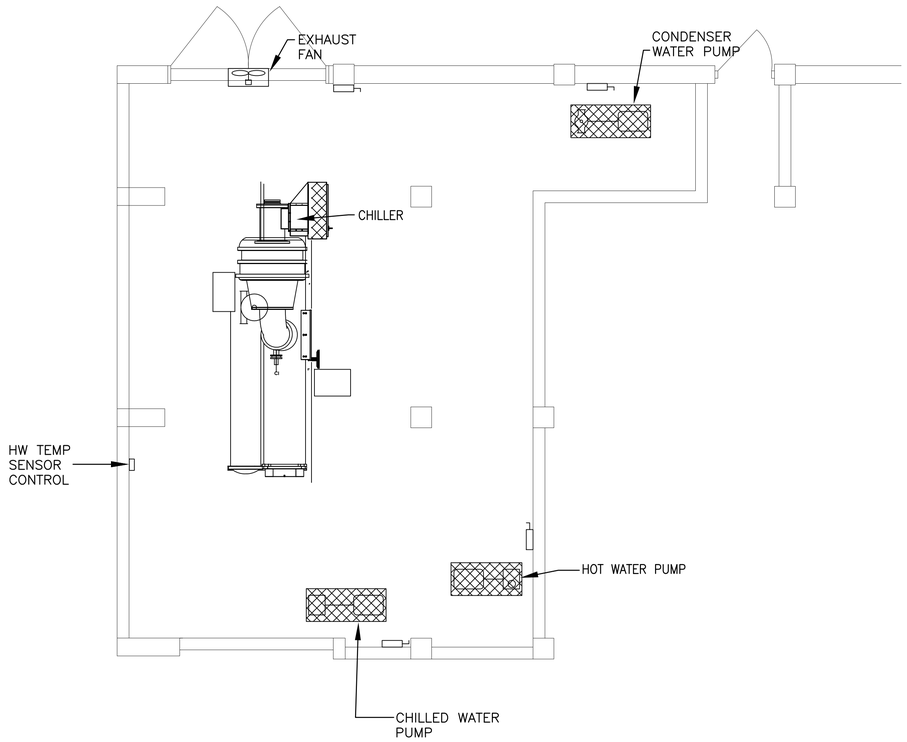
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED NO. 20689 PROFESSIONAL ENGINEER JASON B. LEE

PROJECT #	19-002
FILE NAME:	
DATE:	05/29/19
DRAWN BY:	MAM
CHECKED BY:	JBL

ELECTRICAL SITE PLAN

SHEET NUMBER
E-1
OF
6



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

DEMOLITION NOTES:

1. ALL ITEMS SHOWN ON DEMOLITION PLANS ARE TO BE REMOVED UNLESS NOTED OTHERWISE. REMOVE ALL ASSOCIATED ELECTRICAL ITEMS INCLUDING BUT NOT LIMITED TO CONDUIT, WIRE, DEVICES AND CONDUIT SUPPORTS.
2. ALL REMOVED ELECTRICAL EQUIPMENT (i.e. WIRE, CONDUIT, FIXTURES, SWITCHES, ETC.) SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER AT A LOCATION DESIGNATED BY THE OWNER ON THE SITE OF THE PROJECT. EQUIP-MENT NOT DESIRED BY THE OWNER SHALL BE DISPOSED OF OFF SITE BY THE CONTRACTOR AT NO ADDITIONAL COST.
3. ABANDONED CONDUIT SHALL BE REMOVED WHERE POSSIBLE. ABANDONED CONDUIT WHICH CANNOT BE REMOVED SHALL HAVE WIRES PULLED FROM THEM.
4. WHERE BLANKING PLATES ARE NOT CONCEALED BY NEW WORK, THEY SHALL MATCH THE EXISTING PLATES IN THAT AREA.
5. WHERE EXISTING CIRCUITS ARE REWORKED BY THE ADDITION OR REMOVAL OF CONDUCTORS, THE OLD WIRE SHALL BE REMOVED, THE CONDUIT SWABBED OUT, AND THWN/THHN WIRES REPULLED.
6. ANY MOTORS, HVA/C DEVICES OR OTHER EQUIPMENT WHICH IS TO BE REMOVED SHALL ALSO HAVE THE ELECTRICAL CONNECTIONS REMOVED.
7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE AND BECOME THOROUGHLY FAMILIAR WITH ALL EXISTING CONDITIONS AS HE SHALL BE RESPONSIBLE FOR SAME.
8. IF ANY CUTTING OR PATCHING OF WALLS IS REQUIRED TO GET NEW CIRCUITS INTO EXISTING PANELS THIS CONTRACTOR SHALL BE RESPONSIBLE FOR SAME HOWEVER WORK SHALL BE PERFORMED BY CRAFTSMEN SKILLED IN THAT TRADE.
9. ANY ITEM ABOVE CEILINGS IN EXISTING CORRIDORS OR ROOMS WHICH NEED TO BE RELOCATED FOR INSTALLATION OF NEW ELECTRICAL EQUIPMENT SHALL BE RELOCATED AND RECONNECTED AS REQUIRED. THIS INCLUDES BUT IS NOT LIMITED TO CONDUIT, WIRE, PIPING, AND DUCTWORK.
10. BEFORE DEMOLISHING ANY CONDUIT OR WIRE, THE CONTRACTOR SHALL VERIFY WHAT IT SERVES TO ENSURE SERVICE IS NOT LOST TO ITEMS OUTSIDE OF THE AREA SCHEDULED IN THE PHASING PLAN.
11. EXISTING CONDUITS WHICH PENETRATE EXTERIOR WALLS SHALL BE REMOVED AND EXTERIOR WALLS PATCHED. CONDUIT MAY REMAIN PROVIDED THAT THE CONDUIT IS SEALED ON THE INTERIOR OF THE BUILDING TO PREVENT WATER FROM ENTERING THE BUILDING.

4' 0 4' 8'
GRAPHIC SCALE
1/4"=1'-0"

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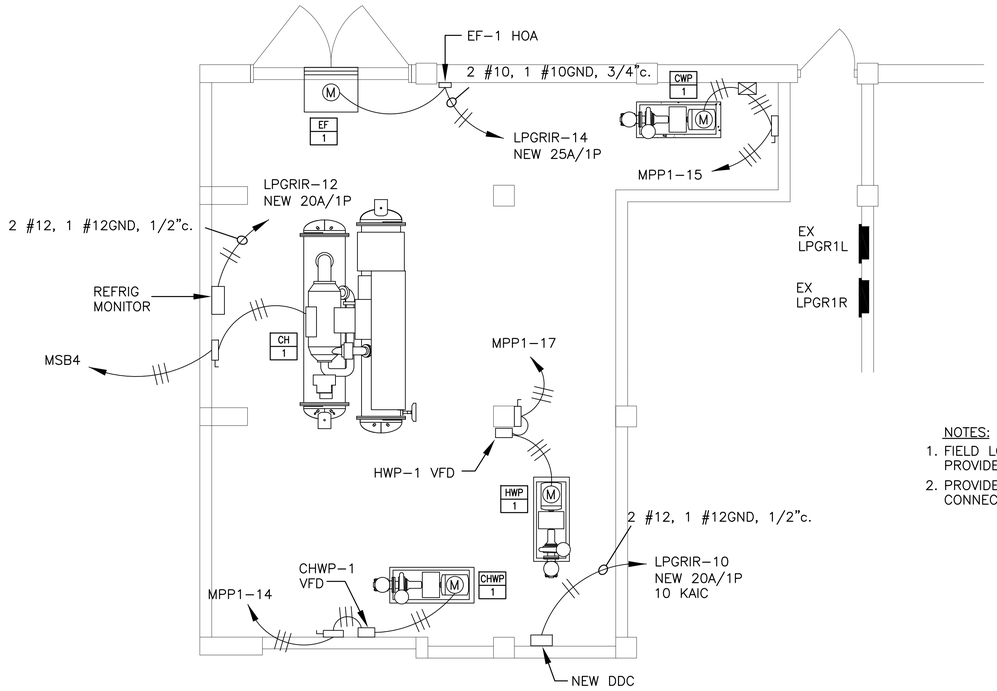
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED 5-29-19 NO. 20689 PROFESSIONAL ENGINEER JASON B. LENT

PROJECT #	19-002
FILE NAME:	
DATE:	05/29/19
DRAWN BY:	MAM
CHECKED BY:	JBL

DEMOLITION PLAN

SHEET NUMBER
E-2
OF
6



NOTES:

1. FIELD LOCATE ALL DISCONNECT SWITCHES. PROVIDE PROPER WORKING CLEARANCES.
2. PROVIDE SEALTITE CONDUIT FOR FINAL CONNECTIONS TO MOTORS.

POWER PLAN

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

4' 0 4' 8'

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

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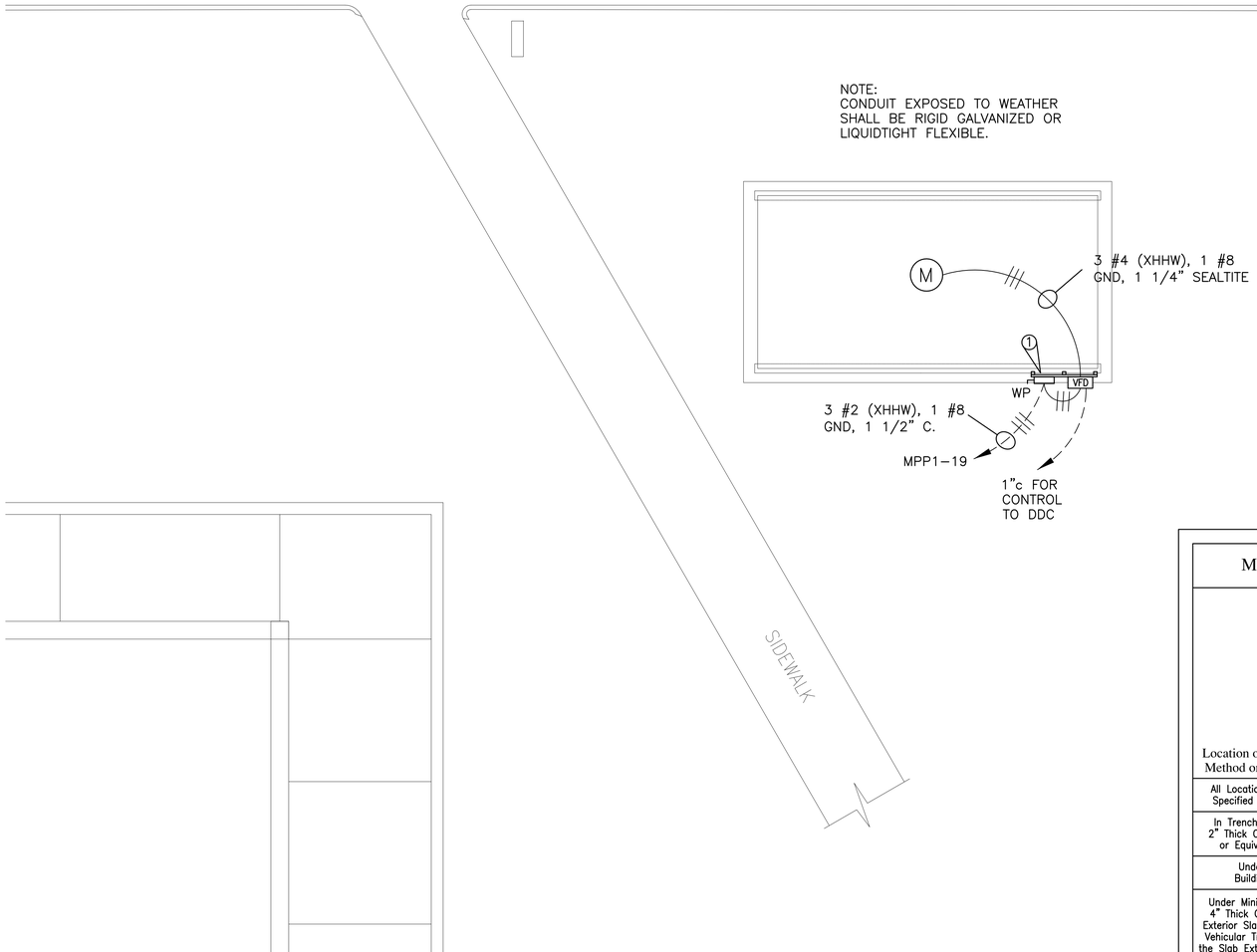
REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED NO. 20689 PROFESSIONAL ENGINEER JASON B. LANGLEY 5-29-19

PROJECT #	19-002
FILE NAME:	
DATE:	05/29/19
DRAWN BY:	MAM
CHECKED BY:	JBL

POWER PLAN

SHEET NUMBER
E-3
OF
6



NOTE:
CONDUIT EXPOSED TO WEATHER SHALL BE RIGID GALVANIZED OR LIQUIDTIGHT FLEXIBLE.

① PROVIDE STAINLESS STEEL STRUT RACK FOR MOUNTING THE FUSIBLE DISCONNECT SWITCH AND M.C. SUPPLIED VARIABLE FREQUENCY DRIVE. FUSE THE SWITCH AT 70A.

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

Minimum Cover Requirements, 0 to 600 Volts, Nominal, Burial in Inches

Location of Wiring Method or Circuit	Type of Wiring Method or Circuit				
	Column 1	Column 2	Column 3	Column 4	Column 5
	Direct Burial Cables or Conductors	Rigid Metal Conduit or Intermediate Metal Conduit	Nonmetallic Raceways Listed for Direct Burial Without Concrete Encasement or Other Approved Raceways	Residential Branch Circuits Rated 120 Volts or Less With GFCI Protection and Maximum Protection of 20 Amperes	Circuits for Control of Irrigation and Landscape Lighting Limited to Not More Than 30 Volts and Installed with Type UF or in Other Identified Cable or Raceway
	In Inches	In Inches	In Inches	In Inches	In Inches
All Locations not Specified Below	24	6	18	12	6
In Trench Below 2" Thick Concrete or Equivalent	18	6	12	6	6
Under Building	0 (In Raceway Only)	0	0	0 (In Raceway Only)	0 (In Raceway Only)
Under Minimum of 4" Thick Concrete Exterior Slab With No Vehicular Traffic and the Slab Extending Not Less Than 6" Beyond the Underground Installation	18	4	4	6 (Direct Burial) 4 (In Raceway)	6
Under Streets, Highways, Roads, Alleys, Driveways, and Parking Lots	24	24	24	24	24

Notes:

1. Cover is defined as the shortest distance in inches measured between a point on the top surface of any direct-buried conductor, cable, conduit, or other raceway and the top surface of finished grade, concrete, or similar cover.
2. Raceways approved for burial only where concrete encased shall require concrete envelope not less than 2" thick.
3. Lesser depths shall be permitted where cables and conductors rise for termination's or splices or where access is otherwise required.
4. Where one of the wiring method types listed in Columns 1–3 is used for one of the circuit types in Column 4 and 5, the shallower depth of burial shall be permitted.
5. Where solid rock prevents compliance with the cover depths specified in this table, the wiring shall be installed in metal or nonmetallic raceway permitted for direct burial. The raceways shall be covered by a minimum of 2" of concrete extending down to rock.

NATIONAL ELECTRICAL CODE 2014 EDITION

4' 0 4' 8'
GRAPHIC SCALE
1/4"=1'-0"

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FLORENCE, ALABAMA

REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED NO. 20689 PROFESSIONAL ENGINEER JASON B. LENT

PROJECT #	19-002
FILE NAME:	
DATE:	05/29/19
DRAWN BY:	MAM
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COOLING TOWER PLAN

SHEET NUMBER
E-4
OF
6

GENERAL ELECTRICAL NOTES:

1. FLEXIBLE CONDUIT INSTALLED OUT-OF-DOORS OR IN ANY NORMALY WET AREAS SHALL BE LIQUID TIGHT FLEXIBLE METAL WITH SUITABLE FITTINGS.
2. DO NOT MOUNT OUTLETS BACK-TO-BACK. THEY MUST BE IN SEPARATE STUD SPACES.
3. CONDUITS SHALL PASS THROUGH WALLS AT 90 DEGREE ANGLES AND SHALL BE RUN PARALLEL OR PERPENDICULAR TO WALLS.
4. BRANCH CIRCUITS AND HOMERUNS SHALL BE #12 WIRE AND 1/2" CONDUIT MINIMUM. EVERY CONDUIT SHALL HAVE A GROUND WIRE (#12 MINIMUM). THIS INCLUDES RECEPTACLE, SWITCH, LIGHT FIXTURE, AND HVAC CIRCUITS.
5. NO MORE THAN 3 PHASE CONDUCTORS MAY BE INSTALLED IN ONE CONDUIT UNLESS NOTED OTHERWISE. N.E.C. REQUIRED DE-RATING SHALL APPLY WHERE MORE THAN 3 PHASE CONDUCTORS ARE ROUTED TOGETHER.
6. ALL RECEPTACLES, SWITCHES, ETC. SHALL BE IN A COLOR AS SELECTED BY THE ARCHITECT.
7. MOUNTING HEIGHTS OF WALL OUTLETS ABOVE FINISHED FLOOR SHALL BE AS INDICATED IN THE LEGEND AND IN THE FOLLOWING TABLE UNLESS NOTED OTHERWISE ON THE PLANS (MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICE):

   SWITCHES (GENERAL) ----------4'-0"
   RECEPTACLES (GENERAL) ---------- 1'-6"
8. MAINTAIN N.E.C. MINIMUM CLEARANCE IN FRONT OF ALL PANELBOARDS.
9. ALL CONDUIT EXPOSED TO WEATHER SHALL BE EITHER RIGID GALVANIZED STEEL OR LIQUID TIGHT FLEXIBLE METAL AS ALLOWED BY THE SPECIFICATION.
10. ALL EXPOSED RACEWAYS ON THE INTERIOR WALLS SHALL BE METALLIC WIREMOLD.
11. PROVIDE CONDUIT AND OUTLET BOXES AS REQUIRED FOR THERMOSTATS. THERMOSTATS ARE SHOWN ON MECHANICAL DRAWINGS.

ELECTRICAL SPECIFICATIONS

A. All Electrical work shall comply with National Electric Code and all local regulations.

B. Conduit for branch circuit inside building and above the floor shall be THIN Wall Metal (EMT).

C. Conduit buried in the ground shall be schedule 40 PVC. Conduit exposed to weather shall be either rigid galvanized or liquid-tight flexible.

D. Wire #4 and larger shall be copper type RHW/USE or XHHW. Wire smaller than #4 shall be copper type THHN/THWN.

E. All grounding shall, as a minimum, comply with the National Electrical Code. Grounding in addition to that required by the NEC shall be completed as shown on the drawings.

F. Scope, Work Included:

   a. Install complete system of electrical wiring to each piece of equipment.

   b. Install empty conduit for thermostat and control circuits as required.

   c. See separate book of specifications for additional and more detailed requirements.

G. Fees and Permits

This Contractor shall pay additional cost that may be incurred by other trades due to the installation of equipment or material, covered by this section of specifications and electrical plans, which differ from that specified.

This Contractor shall secure all licenses and permits and pay all fees required for completion of work under this section of the specifications.

ELECTRICAL LEGEND

T	PAD MOUNTED TRANSFORMER
	BRANCH CIRCUIT RUN IN CEILING OR WALLS. PROVIDE GROUND WIRE IN EACH CONDUIT. NUMBER OF WIRES AS SHOWN (THREE SHOWN HERE PLUS GROUND [IMPLIED]). CONDUIT SHALL BE 1/2" MINIMUM. WIRE SHALL BE #12 COPPER MINIMUM. WIRE FILL PER N.E.C.
P2A-61,63	HOMERUN TO PANELBOARD. SEE SCHEDULE FOR BREAKER SIZE.
	CIRCUIT ROUTED UNDERGROUND OR UNDER CONCRETE SLAB
	CIRCUIT ROUTED UNDERGROUND OR UNDER CONCRETE SLAB
	DISTRIBUTION PANELBOARD, SURFACE MOUNTED
	LIGHTING & APPLIANCE PANELBOARD, SURFACE MOUNTED
	LIGHTING & APPLIANCE PANELBOARD, FLUSH MOUNTED
WP	FUSIBLE, HEAVY DUTY, WEATHERPROOF DISCONNECT, 250 VOLT, SIZED WITH BREAKER
	FIRE ALARM SYSTEM CONTROL PANEL
	MOTOR STARTER
M	MOTOR CONNECTION
CH-1	CHILLER CONNECTION
CHP-1	PUMP CONNECTION

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FLORENCE, ALABAMA

REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA
REGISTERED
5-29-19
NO. 20689
PROFESSIONAL
ENGINEER
JASON B. LENT

PROJECT #	19-002
FILE NAME:	
DATE:	05/29/19
DRAWN BY:	MAM
CHECKED BY:	JBL

LEGEND & NOTES

SHEET NUMBER
E-5
OF
6

SHOALS ENGINEERING, PC
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PROJECT NO.: 19-1788

PANELBOARD SCHEDULE (EXISTING CONDITIONS)

PANEL NAME: MPP1
LOCATION: ELECT. RM ME22

VOLTS: 480Y/480V
PHASE: 3
WIRE: 3
MINIMUM KA.I.C.: 35

MAIN: LUGS
AMPS: 400
POLES: 3
REMARKS: GND BUS, SQD. MLS

MOUNT: SURFACE

CONDUIT	WIRE	ROOM NOS/REMARKS	CIR #	BREAKERS AMP	BREAKERS POLE	AMPS PER PHASE A	AMPS PER PHASE B	AMPS PER PHASE C	PHASES A	PHASES B	PHASES C	AMPS PER PHASE A	AMPS PER PHASE B	AMPS PER PHASE C	BREAKERS AMP	BREAKERS POLE	CIR #	ROOM NOS / REMARKS	CONDUIT	WIRE
EX	EX	JOCKEY PUMP	1	15	3	–			●			–			30	3	12	AIR HANDLING UNIT MEZZ	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	2 H.P. NIGHT PUMP	2	15	3	–			●			–			50	3	13	20 H.P. BOOSTER PUMP	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	AIR COMPRESSOR	3	15	3	–			●			–			50	3	14	CHILLED WATER PUMP	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	3 H.P. BLOWER MOTOR HEATER ROOF	4	15	3	–			●			–			50	3	15	COND. WATER PUMP	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	3 H.P. HOT WATER PUMP	5	15	3	–			●			–			50	3	16	WATER HEATER BOYS MEZZ	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	3 H.P. ROOF EXHAUST FAN	6	15	3	–			●			–			40	3	17	HOT WATER PUMP	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	NORTH BLOWER ROOF HEATER	7	15	3	–			●			–			100	3	18	WATER HEATER GIRLS MEZZ	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	AIR HANDLING UNIT BOYS DORM.	8	20	3	–			●			–			100	3	19	COOLING TOWER	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	EAST ROOF EXHAUST FAN	9	20	3	–			●			–			100	3	20	40 H.P. FIRE PUMP	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	7 1/2 H.P. AIR HANDLING UNIT GIRLS DORM.	10	30	3	–			●			–			30	3	21	UNKNOWN	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	FREIGHT ELEVATOR KITCHEN	11	30	3	–			●			–			100	3	22	SPACE ONLY		
–	EX	–	–	–	–		–			●			–		–	–	–	–		
–	EX	–	–	–	–			–			●			–	–	–	–	–		
		CONNECTED LOAD (AMPS) –							–	–	–									

1 CONDUIT & WIRING TO BE REMOVED. BREAKER TO BE REPLACED.

2 CONDUIT & WIRING TO BE REMOVED. BREAKER TO BE REPLACED.

PANELBOARD SCHEDULE (FINAL CONDITIONS)

PANEL NAME: MPP1
LOCATION: ELECT. RM ME22

VOLTS: 480Y/480V
PHASE: 3
WIRE: 3
MINIMUM KA.I.C.: 35

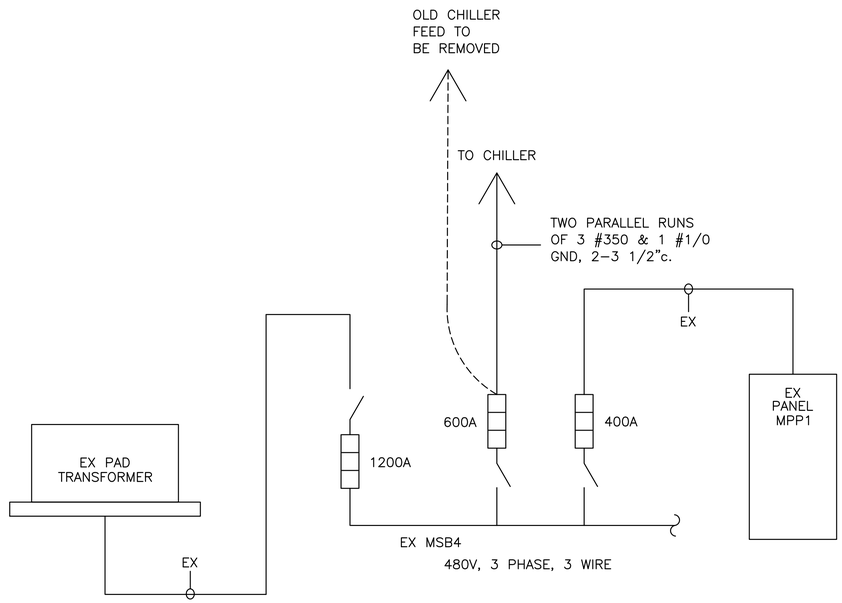
MAIN: LUGS
AMPS: 400
POLES: 3
REMARKS: GND BUS, SQD. MLS

MOUNT: SURFACE

CONDUIT	WIRE	ROOM NOS/REMARKS	CIR #	BREAKERS AMP	BREAKERS POLE	AMPS PER PHASE A	AMPS PER PHASE B	AMPS PER PHASE C	PHASES A	PHASES B	PHASES C	AMPS PER PHASE A	AMPS PER PHASE B	AMPS PER PHASE C	BREAKERS AMP	BREAKERS POLE	CIR #	ROOM NOS / REMARKS	CONDUIT	WIRE
EX	EX	JOCKEY PUMP	1	15	3	–			●			–			30	3	12	AIR HANDLING UNIT MEZZ	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	2 H.P. NIGHT PUMP	2	15	3	–			●			–			50	3	13	20 H.P. BOOSTER PUMP	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	AIR COMPRESSOR	3	15	3	–			●			34			**70**	**3**	14	**CHILLED WATER PUMP CHWP–1 (25 HP)**	**1 1/4**	**4+8G**
–	EX	–	–	–	–		–			●			34		**–**	**–**	–	**–**	**–**	**4**
–	EX	–	–	–	–			–			●			34	**–**	**–**	–	**–**	**–**	**4**
EX	EX	3 H.P. BLOWER MOTOR HEATER ROOF	4	15	3	–			●			27			**60**	**3**	15	**COND. WATER PUMP CWP–1 (20 HP)**	**1**	**6+10G**
–	EX	–	–	–	–		–			●			27		**–**	**–**	–	**–**	**–**	**6**
–	EX	–	–	–	–			–			●			27	**–**	**–**	–	**–**	**–**	**6**
EX	EX	3 H.P. HOT WATER PUMP	5	15	3	–			●			–			50	3	16	WATER HEATER BOYS MEZZ	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	3 H.P. ROOF EXHAUST FAN	6	15	3	–			●			34			**70**	**3**	17	**HOT WATER PUMP HWP–1 (25 HP)**	**1 1/4**	**4+8G**
–	EX	–	–	–	–		–			●			34		**–**	**–**	–	**–**	**–**	**4**
–	EX	–	–	–	–			–			●			34	**–**	**–**	–	**–**	**–**	**4**
EX	EX	NORTH BLOWER ROOF HEATER	7	15	3	–			●			–			100	3	18	WATER HEATER GIRLS MEZZ	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	AIR HANDLING UNIT BOYS DORM.	8	20	3	–			●			34			100	3	19	**COOLING TOWER CT–1 (25 HP)**	**1 1/2**	**2+8G**
–	EX	–	–	–	–		–			●			34		–	–	–	**–**	**–**	**2**
–	EX	–	–	–	–			–			●			34	–	–	–	**–**	**–**	**2**
EX	EX	EAST ROOF EXHAUST FAN	9	20	3	–			●			–			100	3	20	40 H.P. FIRE PUMP	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	7 1/2 H.P. AIR HANDLING UNIT GIRLS DORM.	10	30	3	–			●			–			30	3	21	UNKNOWN	EX	EX
–	EX	–	–	–	–		–			●			–		–	–	–	–	–	EX
–	EX	–	–	–	–			–			●			–	–	–	–	–	–	EX
EX	EX	FREIGHT ELEVATOR KITCHEN	11	30	3	–			●			–			100	3	22	SPACE ONLY		
–	EX	–	–	–	–		–			●			–		–	–	–	–		
–	EX	–	–	–	–			–			●			–	–	–	–	–		
		CONNECTED LOAD (AMPS) –							–	–	–									

DARK INDICATES NEW WIRING AND/OR BREAKERS IN EXISTING PANEL.

XHHW INSULATION



PARTIAL SINGLE LINE DIAGRAM

NO SCALE

SHOALS ENGINEERING, PC
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CHILLER AND COOLING TOWER REPLACEMENT
FLORENCE, ALABAMA

REVISIONS		
NO.	DATE	DESCRIPTION

ALABAMA REGISTERED NO. 20689 PROFESSIONAL ENGINEER JASON B. LEE

PROJECT #	19–002
FILE NAME:	
DATE:	05/29/19
DRAWN BY:	MAM
CHECKED BY:	JBL

SINGLE LINE DIAGRAM

SHEET NUMBER
E–6
OF
6