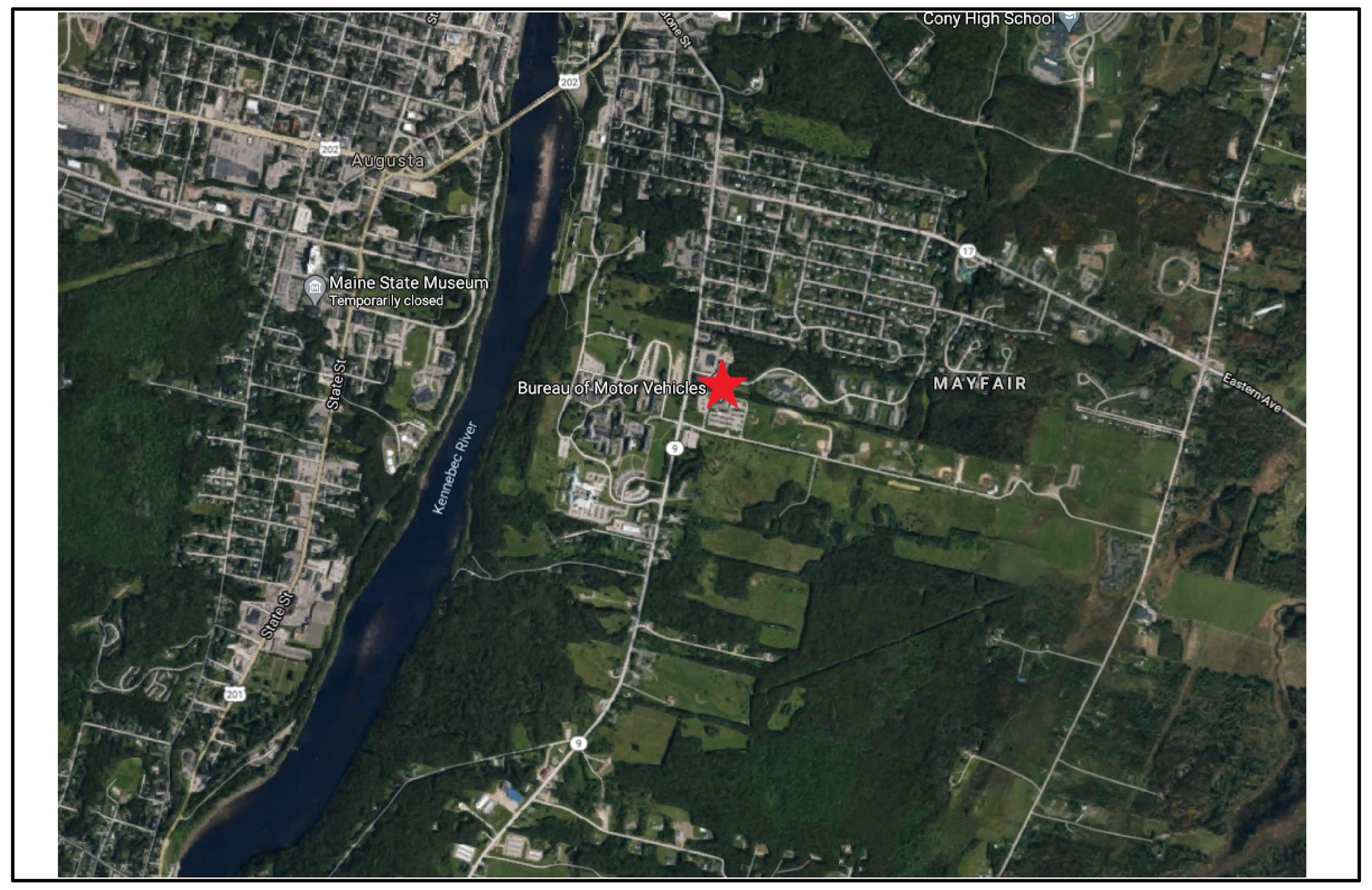
Chiller Replacement

State of Maine Bureau of Motor Vehicles

101 Hospital Street, Augusta, ME 04330

ALLIED PROJECT #20051



LOCATION MAP

ISSUED FOR BID

12/22/2020

DRAWING STATUS LIST

DRAWINGS		ISSUE			
		DATE	11/20/2020	12/11/2020	12/22/2020
		DESCRIPTION	DESIGN DEVELOPMENT	100% REVIEW SET	ISSUED FOR BID
SHEET No.	**SHEET TITLE**				
G-000	COVER SHEET		●	●	●
SF-100	STRUCTURAL - FRAMING PLAN		●	●	●
M-000	PLUMBING AND HVAC NOTES, LEGEND AND ABBREVIATIONS		●	●	●
MH-100	MECHANICAL PART PLAN		●	●	●
M-500	MECHANICAL DETAILS AND SCHEDULES		●	●	●
E-000	ELECTRICAL LEGEND		●	●	●
E-100	ELECTRICAL PART PLAN		●	●	●

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STATE OF MAINE
ANTHONY S. DAVIS
No. 8834
LICENSED PROFESSIONAL ENGINEER

GENERAL NOTES:

1. ALL CONTRACTORS SHALL CONFORM TO SAFETY REQUIREMENTS OF THE BUREAU OF GENERAL SERVICES, OSHA SAFETY AND HEALTH STANDARDS, AND OTHER LOCAL AUTHORITIES IN CONNECTION WITH THE PERFORMANCE OF THIS PROJECT.

2. ALL REFERENCED STANDARDS OR PUBLICATIONS SHALL PERTAIN TO THE MOST CURRENT DATA, STANDARD OR PUBLICATION, UNLESS NOTED OTHERWISE.

3. ANY INCONSISTENCIES WITH THE DRAWINGS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH THE AFFECTED PORTIONS OF THE WORK.

4. ALL DIMENSIONS AND ELEVATIONS SHOWN ON STRUCTURAL DRAWINGS ARE GENERATED FROM EXISTING BUILDING DRAWINGS WHICH WILL BE MADE AVAILABLE TO THE SUCCESSFUL CONTRACTOR. ANY DIMENSIONS OR ELEVATIONS OMITTED OR NOT SHOWN ON THE STRUCTURAL DRAWINGS SHOULD BE CONFIRMED BY THE GENERAL CONTRACTOR. ANY INCONSISTENCIES WITH THE DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH THE AFFECTED PORTIONS OF THE WORK.

5. IF DIFFERENCES OCCUR WITHIN OR BETWEEN THE DRAWINGS AND SPECIFICATIONS REGARDING MATERIALS, STRENGTHS OR QUANTITIES, THE BETTER, HIGHER STRENGTH, AND GREATER QUANTITY INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.

6. THE CONTRACTOR SHALL VISIT THE SITE AT A DESIGNATED TIME APPROVED BY THE OWNER, TO VERIFY EXISTING CONDITIONS, DIMENSIONS, LOCATION OF EXISTING UTILITIES, ETC. THE CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES WITHOUT EXCEPTION.

7. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ERECTION PROCEDURES AND SEQUENCE OF INSTALLATION TO ENSURE SAFETY OF THE BUILDING AND ITS OCCUPANTS DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS AND METHODS AND TEMPORARY SHORING, PRECAUTIONS DURING BUILDING OPERATIONS, PROTECTION OF PUBLIC AND WORKERS, WEATHER PROTECTION OF ANY OPEN WORK ZONES, REMOVAL OF WASTE MATERIAL, PROTECTION OF ADJACENT PROPERTY, PROTECTION OF HAZARDOUS OPENINGS, SAFETY PRECAUTIONS, AND SANITARY PROVISIONS OF EMPLOYEES AND SUBCONTRACTORS AS REQUIRED FOR THE DURATION OF THE CONTRACT.

8. WORK SHALL BE DONE IN AN ORDERLY AND PROFESSIONAL MANNER. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK TO BE DONE BY SUBCONTRACTORS, LOCAL AUTHORITIES, STATE AGENCIES AND/OR UTILITY COMPANIES WHICH MAY HAVE JURISDICTION OVER THIS PROJECT.

9. UTILITY EXTENSIONS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH STATE AND LOCAL CODES.

10. CONTRACTOR SHALL REVIEW AND SUBMIT COMPLETE SHOP DRAWINGS FOR ALL SPECIFIED PARTS OF THE WORK. NO PORTION OF THE WORK COVERED BY THESE SHOP DRAWINGS SHALL COMMENCE UNTIL RETURNED APPROVED SHOPS ARE RECEIVED BY THE CONTRACTOR. SHOP SUBMITTAL PACKAGES SHALL INCLUDE, BUT NOT BE LIMITED TO:
    A. MISCELLANEOUS STEEL: MISCELLANEOUS STEEL FRAMING COMPONENT INLCUDING STAIR FRAMING AND STAIR RAIL ASSEMBLY (INCLUDING SHOP CALCULATIONS PREPARED BY A ME LICENSED PE) SHOP DRAWINGS ALONG WITH STEEL ORIGIN AND STRENGTH/GRADES.
    B. ROOFING COMPONENTS: THOSE ELEMENTS IDENTIFIED IN THE APPROPRIATE SPECIFICATIONS ECTIONS, INCLUDING BUT NOT LIMITED TO, INSULATION, COVER BOARDS, EPDM MEMBRANE, FASTENERS, ADHESIVE PRODUCTS, FLASHINGS, ETC.

11. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY EXISTING ITEMS DAMAGED BY NEW CONSTRUCTION, AND FOR ANY INCIDENTAL REPAIRS OF EXISTING FINISHED SURFACES DISTURBED BY NEW CONSTRUCTION; SUCH REPAIRS SHALL MATCH EXISTING TO THE OWNER'S SATISFACTION.

12. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING, HANDLING, AND STORAGE OF ITEMS/MATERIALS TO REMAIN THE PROPERTY OF THE OWNER WITH THE OWNER'S REPRESENTATIVE.

13. THE CONTRACTOR SHALL CLEAN, INSPECT AND TEST ALL EXISTING ROOF DRAIN LEADERS AND REPORT ANY DEFECTS TO THE ENGINEER.

14. CONTRACTOR SHALL FIELD VERIFY AND CONFIRM COMPOSITION OF EXISTING ROOF MEMBRANE, INSULATION AND COVER BOARD SYSTEM TO THE ROOF DECK SYSTEM PRIOR TO SUBMITTING A BID.

15. CONTRACTOR SHAL VERIFY BY MEANS OF SITE INSPECTION, PRIOR TO BID, THE EXTENT, QUANTITY AND LOCATIONS OF ANY AND ALL CONDUIT, LIGHT FIXTURES, WIRING, MECHANICAL EQUIPMENT, DUCTWORK, ETC...REQUIRING REMOVAL AND REINSTALLATION FOR PROPER INSTALLATION ACCESS.

16. COORDINATE DUST PROTECTION AND TEMPORARY PROTECTIONS WITHIN THE BUILDING WITH THE OWNER PRIOR TO THE START OF CONSTRUCTION.

17. MECHANICAL EQUIPMENT RESTING ON THE CONCRETE FLOOR SLAB SHALL HAVE A 4-INCH HIGH CONCRETE PAD UNDERNEATH, EXTENDING A MINIMUM OF 6-INCHES BEYOND UNIT EDGE (EACH DIRECTION), REINFORCED WITH #3 BARS AT 18-INCHES ON-CENTER EACH WAY. COORDINATE WITH MECHANICAL DRAWINGS FOR LOCATIONS REQUIRED.

CODES AND LOADS:

1. BUILDING CODE:
    A. INTERNATIONAL BUILDING CODE – 2015 EDITION
    B. ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

2. MINIMUM LOADING REQUIREMENTS:
    A. ROOF SNOW LOADS:
        a. GROUND SNOW LOAD: P_G = 70.0 PSF
            1. IMPORTANCE FACTOR: I = 1.0
            2. COLD ROOF SLOPE FACTOR: C_S = 1.0
            3. THERMAL FACTOR: C_T = 1.1
            4. EXPOSURE FACTOR: C_E= 1.0
            5. TERRAIN CATEGORY: C
        b. FLAT ROOF SNOW LOAD P_f = 53.9 PSF
    B. PROPOSED ROOF DEAD LOAD: 20.0 PSF
    C. ROOF LIVE LOAD:
        a. STANDARD ROOF LIVE LOAD:
            1. ALL ROOF LEVELS 20 PSF, 300 POUND CONCENTRATED
    D. WIND:

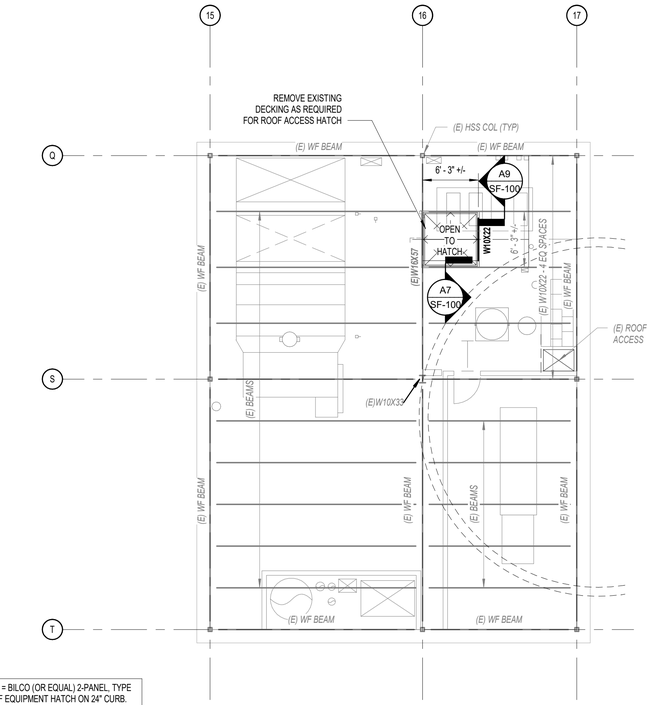
Wind Design Data

Ultimate Wind Speed:	115 mph	Nominal Wind Speed:	89 mph
Risk Category:	II	Wind Exposure:	C
Enclosure Classification:	Enclosed	End Zone Width:	5.60 ft.
Internal Pressure Coefficient:		0.18 +/-	
Components and Cladding Design Pressures	Roof Zone 1:	+16.0 psf max.,	-30.8 psf min.
	Roof Zone 2:	+16.0 psf max.,	-51.6 psf min.
	Roof Zone 3:	+16.0 psf max.,	-77.7 psf min.
	Roof at Zone 2 Overhangs:		-44.3 psf min.
	Roof at Zone 3 Overhangs:		-72.9 psf min.
	Wall Zone 4:	+30.8 psf max.,	-33.3 psf min.
	Wall Zone 5:	+30.8 psf max.,	-41.2 psf min.

The Ultimate Wind Speed was used to determine the above Component and Cladding Design Pressures.

This Building is not in a Wind-Borne Debris Region, and opening protection is not required.

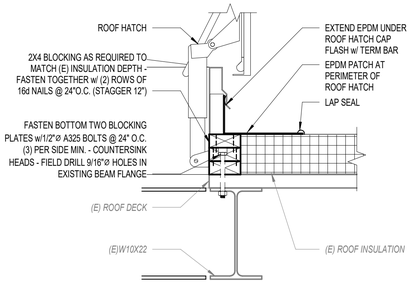
The site of this building is not subject to special topographic wind effects as per Section 1609.1.1.1 of the code.



HATCH = BILCO (OR EQUAL) 2-PANEL, TYPE D ROOF EQUIPMENT HATCH ON 24" CURB.
FRAME OPENING WIDTH = 5' - 9" x 5' - 9" +/-
G.C. CONFIRM EXISTING BEAM-TO-BEAM SPACING. FRAME OPENING WIDTH SHALL BE EXISTING BEAM-TO-BEAM SPACING MINUS 6"

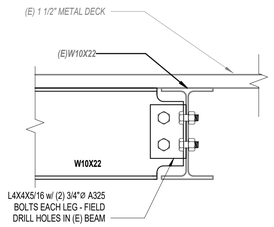
D7 — STRUCTURAL ~ PENTHOUSE ROOF FRAMING PLAN

1/8" = 1'-0"



A7 — SECTION - PATCH @ ROOF HATCH

1 1/2" = 1'-0"



A9 — SECTION - BEAM CONN. (E) BEAM

1 1/2" = 1'-0"

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Allied Engineering
Structural Mechanical Electrical Commissioning

STATE OF MAINE — WILLIAM P. FAUCHER — No. 13135 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

No.	DATE	BY	DESCRIPTION

Date: 12-22-2020
Drawn By: PED
Checked By: WPF
Project Mgr: ASD
Project No: 20051
Cad File: 20051_S_R20.rvt
Graphic Scale: 0" 1"

STRUCTURAL - FRAMING PLAN

STATE OF MAINE BUREAU OF MOTOR VEHICLES
CHILLER REPLACEMENT
101 Hospital Street, Augusta, ME 04330

SF-100

ISSUED FOR BID

C:\Users\cwhitcomb\Documents\00-Local_Files\20051_S_R20_cwhitcomb.WVJWE.rvt

E1 SYMBOLS LEGEND

NONE

- PIPE ELBOW TURNED DN
- PIPE ELBOW TURNED UP
- PIPING TEE DOWN
- PIPING TEE UP
- PIPE RISER
- 45° ELBOW DOWN
- PIPING TO BE REMOVED
- CAPPED PIPING
- CAPPED BELOW FINISHED FLOOR
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- DIRECTION OF FLOW
- PIPE PITCHES DOWN
- PIPE GUIDE
- EXPANSION JOINT
- PIPE ANCHOR
- UNION
- FLANGED CONNECTION
- BACKFLOW PREVENTER
- FLEXIBLE CONNECTION
- SHUT-OFF/ISOLATION VALVE REFER TO SPECIFICATIONS
- GATE VALVE ~ OUTSIDE SCREW & YOKE (OS&Y)
- GLOBE VALVE
- LOCKABLE BALL VALVE
- PLUG VALVE
- 2-WAY CONTROL VALVE
- 3-WAY CONTROL VALVE
- LOCK & SHIELD VALVE
- CHECK VALVE
- BALANCING VALVE CIRCUIT SETTER
- AIR VENT ~ REFER TO SPECIFICATIONS
- STRAINER WITH BLOWDOWN VALVE AND CAP
- EXPANSION VALVE (AUTOMATIC)
- RELIEF/SAFETY VALVE
- PRESSURE GAUGE WITH COCK
- SIGHT GLASS
- PRESSURE REDUCING VALVE
- FLOW SWITCH
- SELF-CONTAINED TEMP. CONTROL VALVE WITH REMOTE SENSOR
- STEAM TRAP (FLOAT & THERMOSTATIC INDICATED T.T.= THERMOSTATIC TRAP, B.T.= BUCKET TRAP)
- PUMP ~ POINT OF TRIANGLE INDICATES DIRECTION OF FLOW
- GAS SHUT-OFF VALVE
- HOSE END DRAIN VALVE W/CAP
- TEMPERATURE/PRESSURE TAP (PETE'S PLUG)
- THERMOMETER WITH COCK
- SOLENOID VALVE
- ORIFICE FLOWMETER
- DIFFERENTIAL PRESSURE TRANSMITTER
- HUMIDIFIER (DUCT/AHU MOUNTED)
- FINNED TUBE BASEBOARD
- HOSE BIB/WALL HYDRANT
- FLOOR CLEANOUT
- FUSIBLE LINK VALVE
- WALL CLEANOUT
- AQUASTAT
- EXPANSION LOOP
- EXPANSION LOOP (BRAIDED/MANUFACTURED)
- FLOOR DRAIN
- SHOCK ABSORBER (WATER HAMMER ARRESTER)
- FIRE DEPARTMENT CONNECTION
- FREE STANDING FIRE DEPARTMENT CONNECTION
- WATER GONG
- DUCTWORK ~ FIRST DIMENSION IS SIDE SHOWN IN INCHES S= SUPPLY, R= RETURN, E= EXHAUST AIR, OA= OUTSIDE AIR F.O. = FLAT OVAL
- ACCOUSTICAL LINING (DUCT DIMENSION FOR NET FREE AREA)
- DUCTWORK TO BE REMOVED
- SINGLE LINE DUCTWORK TO BE REMOVED
- DUCT TRANSITION
- SQUARE TO ROUND DUCT TRANSITION
- FLEX DUCT ~ DOUBLE LINE
- FLEX DUCT ~ SINGLE LINE
- CHANGE IN ELEVATION (UP, DOWN, RISE OR DROP)
- SUPPLY DUCT TURNED UP/DN
- RETURN DUCT TURNED UP/DN
- EXHAUST DUCT TURNED UP/DN
- ROUND DUCT TURNED UP/DN
- MITERED DUCT ELBOW W/TURNING VANES
- RADIUS DUCT ELBOW
- DUCT/PIPE CAP (SINGLE/DOUBLE LINE)
- VOLUME DAMPER
- FIRE DAMPER
- SMOKE DAMPER
- FIRE AND SMOKE DAMPER
- BACKDRAFT DAMPER
- MOTORIZED DAMPER
- FLEXIBLE CONNECTION
- TEMPERATURE SENSOR OR THERMOSTAT (AS SPECIFIED)
- HUMIDISTAT OR HUMIDITY SENSOR (AS SPECIFIED)
- CARBON DIOXIDE SENSOR
- CARBON MONOXIDE SENSOR
- ACCESS PANEL
- DUCT SMOKE DETECTOR
- ROOFTOP EXHAUST FAN
- ROOFTOP SUPPLY FAN
- CEILING DIFFUSER ~ 4-WAY BLOW
- CEILING DIFFUSER ~ 3-WAY BLOW
- CEILING DIFFUSER ~ 2-WAY BLOW
- CEILING DIFFUSER ~ CORNER BLOW
- CEILING RETURN GRILLE
- CEILING EXHAUST GRILLE
- POINT OF CONNECTION - EXISTING TO NEW
- DIRECTION OF AIR FLOW

REGISTER, GRILLE & DIFFUSER TAG
- DIFFUSER, REGISTER OR GRILLE No.
- QUANTITY
- CFM AIR FLOW

FINTUBE TAG
- FINTUBE No.
- LENGTH
- GPM

VAV TAG
- VAV No.
- MINIMUM CFM
- MAXIMUM CFM
- GPM

EQUIPMENT TAG
- TYPE DESIGNATOR
- NUMBER

EQUIPMENT TAG (ON FLOOR/ROOF ABOVE)
- TYPE DESIGNATOR
- NUMBER

DETAIL REFERENCE SYMBOL
- DETAIL No.
- SHEET DETAIL LOCATED ON

SECTION REFERENCE SYMBOL
- SECTION No.
- SHEET SECTION LOCATED ON

A1 PIPING LINETYPE LEGEND

NONE

AW	ACID WASTE
ATV	AIR RELIEF
BBD	BOILER BLOWDOWN
C	CONDENSATE (HVAC DRAIN PAN)
CA	COMPRESSED AIR
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CTR	COOLING TOWER RETURN
CTS	COOLING TOWER SUPPLY
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	DOMESTIC HOT WATER RECIRC.
D	DRAIN
FM	PUMP FORCE MAIN
FOF	FUEL OIL FILL
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL TANK VENT
FW	FEEDWATER
GR	GLYCOL RETURN
GS	GLYCOL SUPPLY
GW	GREASE WASTE
GWR	GEOTHERMAL WATER RETURN
GWS	GEOTHERMAL WATER SUPPLY
H	HUMIDIFICATION LINE
H2	HYDROGEN GAS
HCR	HEAT/COOL RETURN
HCS	HEAT/COOL SUPPLY
HPWR	HEAT PUMP WATER RETURN
HPWS	HEAT PUMP WATER SUPPLY
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HTWR	HIGH-TEMP HOT WATER RETURN
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
IND	INDUSTRIAL WASTE
IW	INDIRECT WASTE
LN	LIQUID NITROGEN
LOX	LIQUID OXYGEN
LP	LIQUID PETROLEUM GAS
LPR	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
MA	MEDICAL AIR
MPR	MEDIUM PRESSURE CONDENSATE
MPS	MEDIUM PRESSURE STEAM
MUW	MAKE-UP WATER
N2	NITROGEN
NG	NATURAL GAS
NO	NITROUS OXIDE
NPW	NON-POTABLE WATER
OX	OXYGEN
PC	PUMPED CONDENSATE
PCWR	PROCESS COLD WATER RETURN
PCWS	PROCESS COLD WATER SUPPLY
RD	REFRIGERANT DISCHARGE
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RO	REVERSE OSMOSIS WATER
RW	RAIN WATER - ABOVE FLOOR
RW	RAIN WATER - BELOW GRADE
RWO	RAIN WATER OVERFLOW - ABOVE FLOOR
RWO	RAIN WATER OVERFLOW - BELOW GRADE
SP	SPRINKLER MAIN PIPING
SWR	SOLAR WATER RETURN
SWS	SOLAR WATER SUPPLY
TP	TRAP PRIMER - ABOVE FLOOR
TP	TRAP PRIMER - BELOW GRADE
TWR	TEMPERED WATER RETURN
TWS	TEMPERED WATER SUPPLY
V	SANITARY SOIL VENT - ABOVE FLOOR
V	SANITARY SOIL VENT - BELOW GRADE
VAC	VACUUM (AIR)
VC	VACUUM CLEANING (HOUSE)
VPD	VACUUM PUMP DISCHARGE
W	SANITARY SOIL WASTE - ABOVE FLOOR
W	SANITARY SOIL WASTE - BELOW GRADE
WV	SANITARY WET VENT - ABOVE FLOOR
WV	SANITARY WET VENT - BELOW GRADE

A4 ABBREVIATIONS

NONE

AAV	AUTOMATIC AIR VENT
AC	ABOVE CEILING
ACC	AIR COOLED CONDENSER
ACU	AIR CONDITIONING UNIT
ADA	AMERICANS WITH DISABILITIES ACT
AD	ACCESS DOOR
AE	ACID EXHAUST
AW	ACID WASTE
AFF; A.F.F.	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
APPROX.	APPROXIMATE; APPROXIMATELY
APMR	AS PER MFR'S RECOMMENDATIONS
ATC	AUTOMATIC TEMPERATURE CONTROL
AV	AIR VENT
BC	BALANCING COCK
BDD	BACKDRAFT DAMPER
BG	BLAST GATE
BF	BARRIER FREE
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
B.T.U.; BTU	BRITISH THERMAL UNIT
CONV.	CONVECTOR
CCW	COUNTER CLOCKWISE
CFF	CAPPED FOR FUTURE
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CO	CLEANOUT
CM	CONSTRUCTION MANAGER
CNTR	COUNTER; COUNTER TOP
CONN	CONNECT; CONNECTION
CONT.	CONTINUE; CONTINUATION
COORD.	COORDINATE
CORR	CORRIDOR
CR	CHEMICAL RESISTING
CT	COOLING TOWER
CTE	CONNECT TO EXISTING
CTR	CENTER
CTRLN	CENTERLINE
CU	COPPER; CONDENSING UNIT
CUH	CABINET UNIT HEATER
C.V.	CONTROL VALVE
CW	COLD WATER; CLOCKWISE
DB	DRY BULB TEMPERATURE
DC	DOUBLE CONTAINED
DDC	DIRECT DIGITAL CONTROL
DET	DETAIL
DIA	DIAMETER
DIC	DOWN IN CHASE
DIW	DOWN IN WALL
DN	DOWN
DS	DOWNSPOUT
DT	DROP AND TRANSITION
DV	DRAIN VALVE
DWG	DRAWING
E	EXHAUST AIR
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ELEV	ELEVATION
ELONG	ELONGATE
ENC	ENCLOSURE
ER	EXHAUST REGISTER
ERU	ENERGY RECOVERY UNIT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
(E)	EXISTING
F&T	FLOAT AND THERMOSTATIC
FBO	FURNISHED BY OTHERS
FBP	FACE AND BYPASS
FC	FLEXIBLE CONNECTION
FCO	FLOOR CLEANOUT
FD-#	FLOOR DRAIN TAG
FD	FIRE DAMPER
FDC	FIRE DEPT. CONNECTION
FIN	FINISH
FL; FLR	FLOOR
FP	FROST/FREEZE PROOF
FTG	FOOTING
FTR	FINNED TUBE RADIATION
FS	FLOW SWITCH
FM	FORCE MAIN
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
GRV	GRAVITY ROOF VENTILATOR
H	HUMIDIFIER
HB	HOSE BIBB
HC; HDC	HANDICAP ACCESS
HGT; HT	HEIGHT
HP	HEAT PUMP
HRU	HEAT RECOVERY UNIT
HTR	HEATER
H&V	HEATING AND VENTILATION
HVAC	HEATING, VENTILATING AND AIR COND.
HW	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
ID	INSIDE DIAMETER
IN WG	INCHES WATER GAUGE
INCL.	INCLUDING
INV. EL.	INVERT ELEVATION
IPS	IRON PIPE SIZE
KE-#	KITCHEN EQUIPMENT NUMBER
LD	LINEAR DIFFUSER
LE-#	SCIENCE LAB EQUIPMENT NUMBER
LP	LIQUID PETROLEUM GAS
LPR	LOW PRESSURE STEAM RETURN
LPS	LOW PRESSURE STEAM SUPPLY
MAX	MAXIMUM
MBH	1000 BTUH/hr.
MFR	MANUFACTURER
MIN	MINIMUM
MOD	MOTOR OPERATED DAMPER
MPG	MEDIUM PRESSURE GAS
MPV	MULTI-PURPOSE VALVE
MTD	MOUNTED
MTG	MOUNTING
MUA	MAKE UP AIR
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OBD	OPPOSED BLADE DAMPER
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
P-#	PLUMBING FIXTURE TAG
PD	PUMPED DISCHARGE
PP	PROCESS PIPING
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
R	RETURN AIR
RD	ROOF DRAIN
REC	RECOMMENDATION
REG	REGULAR
RF	RETURN FAN
RG	RETURN GRILLE
RHC	REHEAT COIL
RM	ROOM
RPZ	REDUCED PRESSURE BFP
RR	RETURN REGISTER
RV	RELIEF VALVE
RW	RAIN WATER
S	SUPPLY AIR
SA-" "	SHOCK ABSORBER OF PDI SIZE (" ") AS INDICATED
SCV	SELF-CONTAINED VALVE
SD	SMOKE DAMPER
SF	SUPPLY FAN
SG	SUPPLY GRILLE
SGL	SINGLE
SHT	SHEET
SPLR	SPRINKLER
SQ. FT; SF	SQUARE FEET
SR	SUPPLY REGISTER
S/O	SHUT-OFF
S.S.	STAINLESS STEEL
TD	TRENCH DRAIN
TG	TRANSFER GRILLE
TOD	TOP OF DUCT
TP	TRAP PRIMER
TSP	TOTAL STATIC PRESSURE
TTS	TIGHT TO STEEL
TV	TURNING VANE
TW	TEMPERED WATER
TYP	TYPICAL
UH	UNIT HEATER
UIC	UP IN CHASE
UIW	UP IN WALL
UV	UNIT VENTILATOR
V	VENT
VAC	VACUUM
VB	VACUUM BREAKER
VCFF	VALVE & CAP FOR FUTURE
VD	VOLUME DAMPER - MANUAL
VLV	VALVE
VS	VENT STACK
VTR	VENT TO ROOF
W	WASTE
W/	WITH
WB	WET BULB TEMPERATURE, °F
WCO	WALL CLEANOUT
WH	WATER HEATER
WHYD	WALL HYDRANT
Ø	DIAMETER
@	AT
&	AND
%	PERCENT

NOTE

ALL GENERAL NOTES, SYMBOL LEGENDS AND DETAILS ARE TO BE CONSIDERED AS APPLICABLE TO ALL PLUMBING AND HVAC DRAWINGS FOR THIS PROJECT. SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY AND DO NOT INDICATE THEIR INCORPORATION INTO THE DESIGN.

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STATE OF MAINE ANTHONY S. DAVIS No. 8834 LICENSED PROFESSIONAL ENGINEER

REVISIONS

No.	DATE	BY	DESCRIPTION

Date: 12-22-2020
Drawn By: CRG
Checked By: ASD
Project Mgr: ASD
Project No: 20051
Cad File:
Graphic Scale: 0" 1"

PLUMBING AND HVAC NOTES, LEGEND AND ABBREVIATIONS

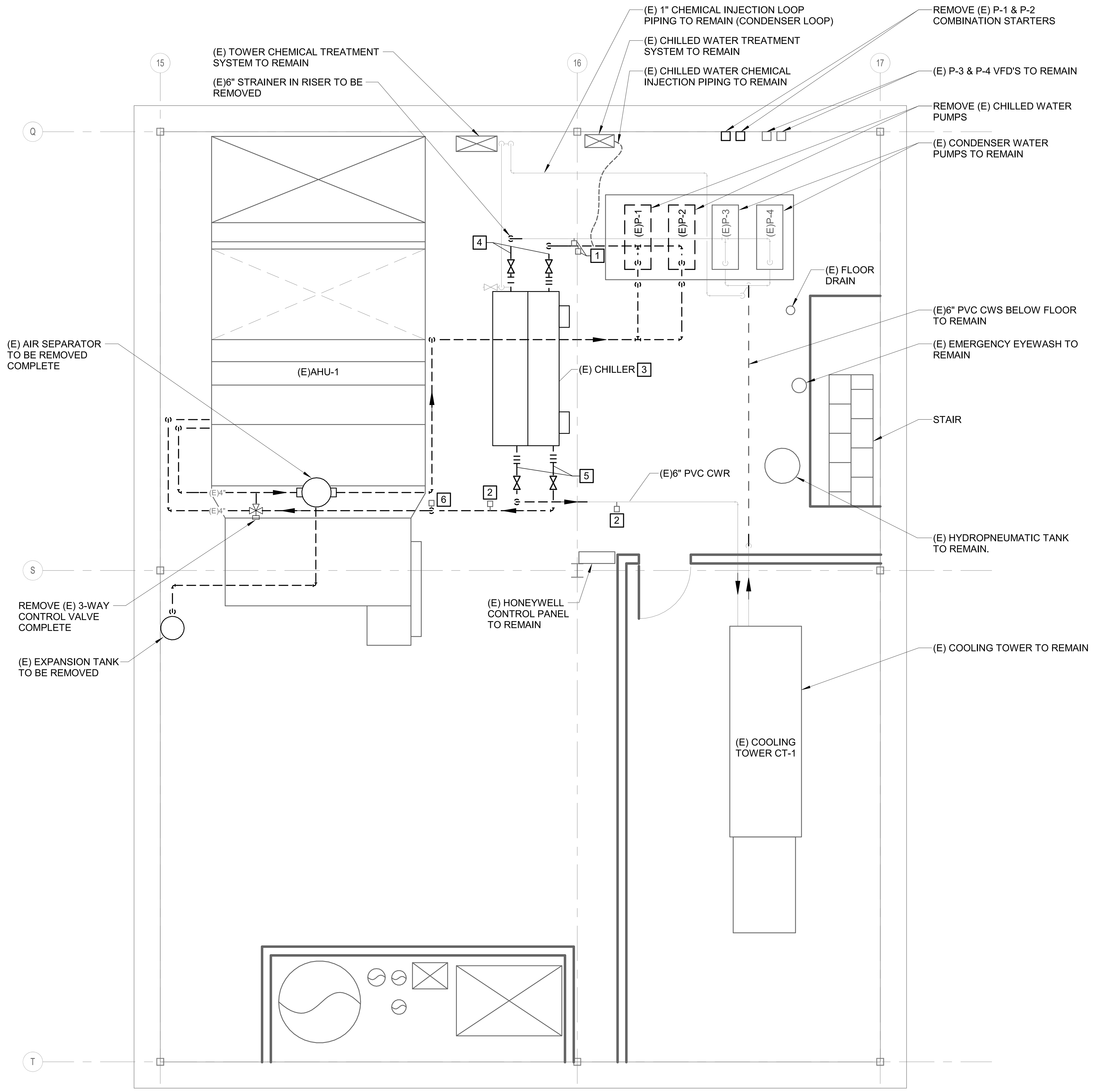
STATE OF MAINE BUREAU OF MOTOR VEHICLES CHILLER REPLACEMENT
101 Hospital Street, Augusta, ME 04330

M-000

ISSUED FOR BID

DEMOLITION KEYED NOTES:

1. (E) TEMPERATURE SENSOR TO REMAIN.
2. (E) FLOW SWITCH TO BE REMOVED.
3. REMOVE (E) WATER COOLED CHILLER COMPLETE.
4. REMOVE (E) CHWR & CWS SUPPLY PIPING AND FLEX CONNECTORS AS REQUIRED TO FACILITATE THE INSTALLATION OF THE NEW CHILLER.
5. REMOVE (E) CHWS & CWR PIPING AND FLEX CONNECTORS AS REQUIRED TO FACILITATE THE INSTALLATION OF THE NEW CHILLER.
6. RELOCATE (E) TEMPERATURE SENSOR



A1 MECHANICAL DEMOLITION PART PLAN

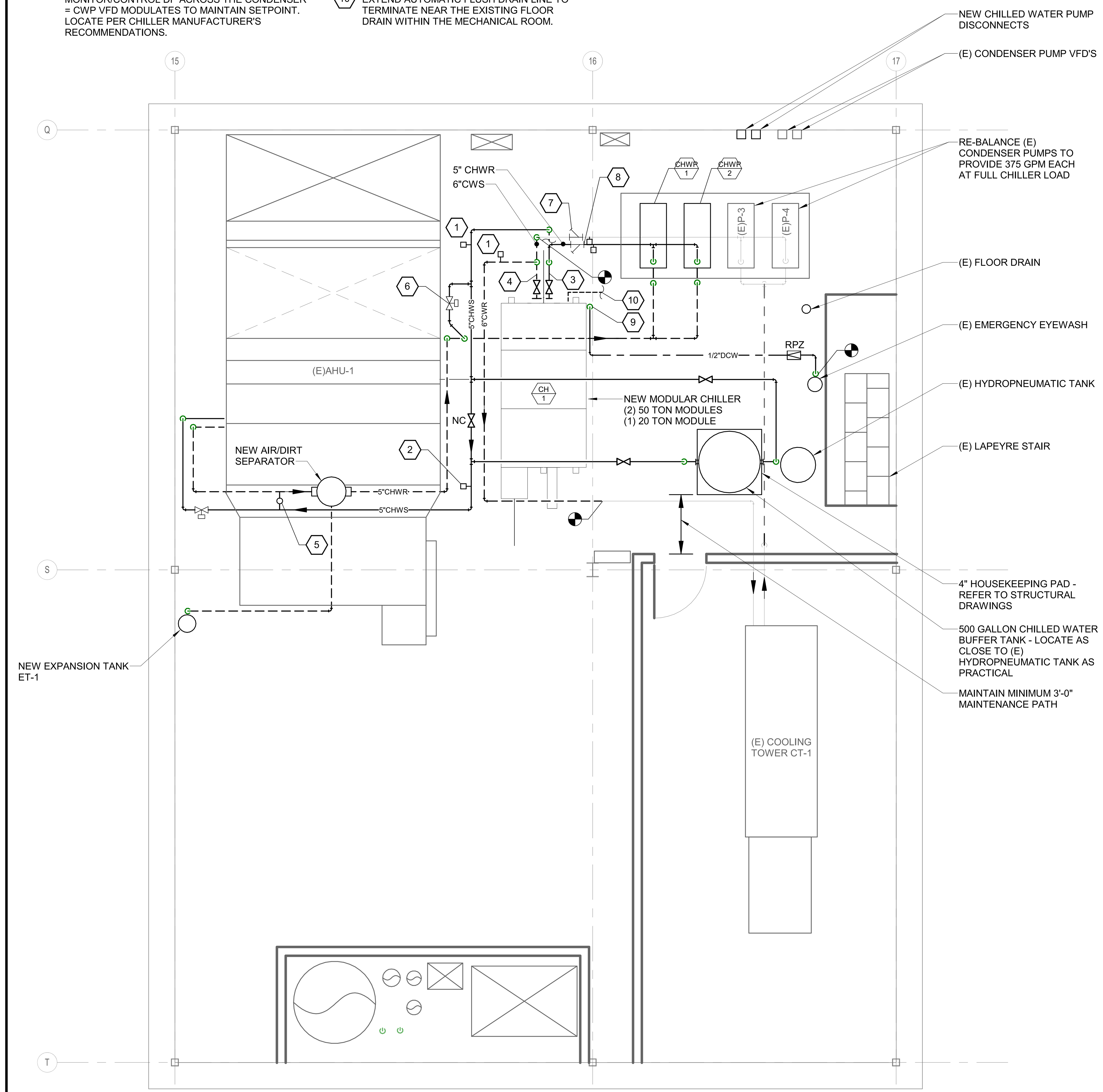
1/4" = 1'-0"

KEYED NOTES:

1. CHILLER FLOW SWITCHES ARE SHOWN DIAGRAMATICALLY. SWITCHES SHALL BE FACTORY INSTALLED AT EACH MODULE AND FOR BOTH THE EVAPORATOR AND CONDENSER SECTIONS AS SPECIFIED.
2. RELOCATED (E) TEMPERATURE SENSOR.
3. FURNISH AND INSTALL A DIFFERENTIAL PRESSURE TRANSMITTER BETWEEN CHWS + CHWR TO MONITOR/CONTROL DP ACROSS THE EVAPORATOR - BYPASS VALVE MODULATES TO MAINTAIN SETPOINT FOR MIN FLOW - 96 GPM. LOCATE PER CHILLER MANUFACTURER'S RECOMMENDATIONS.
4. FURNISH AND INSTALL A DIFFERENTIAL PRESSURE TRANSMITTER BETWEEN CWS + CWR TO MONITOR/CONTROL DP ACROSS THE CONDENSER = CWP VFD MODULATES TO MAINTAIN SETPOINT. LOCATE PER CHILLER MANUFACTURER'S RECOMMENDATIONS.
5. FURNISH AND INSTALL A DIFFERENTIAL PRESSURE TRANSMITTER BETWEEN CHWS + CHWR - CHWP VFD MODULATES PUMP SPEED TO MAINTAIN DP SETPOINT.
6. BYPASS VALVE SIZED FOR 145 GPM.
7. FURNISH AND INSTALL A NEW 6" STRAINER EQUAL TO EATON MODEL 85Y, 30 MESH STRAINER.
8. FURNISH AND INSTALL A NEW 5" STRAINER EQUAL TO EATON MODEL 85Y, 30 MESH STRAINER.
9. DROP AND CONNECT TO AUTOMATIC STRAINER FLUSH SUPPLIED WITH CHILLER.
10. EXTEND AUTOMATIC FLUSH DRAIN LINE TO TERMINATE NEAR THE EXISTING FLOOR DRAIN WITHIN THE MECHANICAL ROOM.

GENERAL NOTES:

1. REFER TO STRUCTURAL DRAWING FOR CREATING AN OPENING THROUGH THE PENTHOUSE ROOF AS REQUIRED TO FACILITATE RIGGING FOR THE CHILLER AND BUFFER TANK.
2. THE CONTRACTOR SHALL COORDINATE STRICTLY WITH THE CHILLER MANUFACTURER FOR SHIPPING OF THE CHILLER IN SEPARATE MODULES TO FACILITATE EASE OF RIGGING INTO THE SPACE. ONCE IN PLACE, THE CONTRACTOR SHALL ASSEMBLE THE CHILLER USING FACTORY SUPPLIED BASE TUBES. THE CONTRACTOR SHALL RETAIN THE SERVICES OF A FACTORY AUTHORIZED TECHNICIAN FOR A MINIMUM OF 8 HRS TO SUPERVISE AND OVERSEE THE ASSEMBLY PROCESS TO INSURE THAT THE INSTALLATION MEETS FACTORY REQUIREMENTS. COORDINATE AS REQUIRED TO INSURE COMPONENTS ARE CONFIGURED TO FACILITATE THE FIELD ASSEMBLY. IF THE CONTRACTOR FEELS THAT THROUGH THE USE OF ADDITIONAL RIGGING REQUIREMENTS AND RELOCATION OF EXISTING UTILITIES WITHIN THE PROJECT MECHANICAL ROOM, THE CHILLER MAY BE RIGGED INTO PLACE AS A SINGLE, FACTORY ASSEMBLED UNIT, THAT SHALL BE ACCEPTABLE, PROVIDED THE CHILLER SHIPS WITH APPROPRIATE LIFTING RAILS AND THE UTILITY RELOCATIONS DO NOT CAUSE DISRUPTION TO THE FACILITY OUTSIDE OF THOSE RESULTANT OF SIMPLE CHILLER DECOMMISSIONING.



A6 MECHANICAL PART PLAN

1/4" = 1'-0"

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STATE OF MAINE ANTHONY S. DAVIS No. 8834 LICENSED PROFESSIONAL ENGINEER

REVISIONS

No.	DATE	BY	DESCRIPTION

Date: 12-22-2020
Drawn By: CRG
Checked By: ASD
Project Mgr.: ASD
Project No: 20051
Cad File:
Graphic Scale: 0" 1"

STATE OF MAINE BUREAU OF MOTOR VEHICLES
CHILLER REPLACEMENT
101 Hospital Street, Augusta, ME 04330

MECHANICAL PART PLAN

MH-100

ISSUED FOR BID

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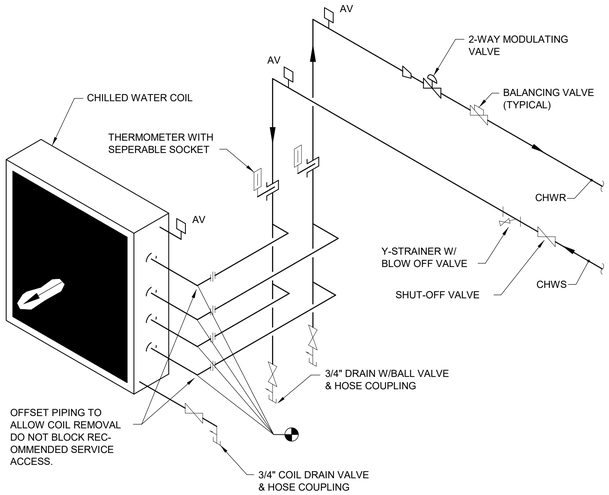
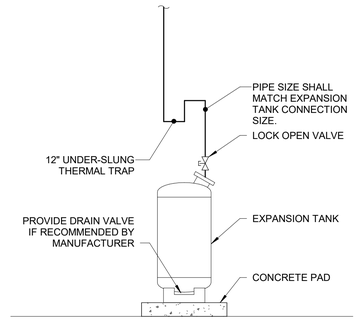
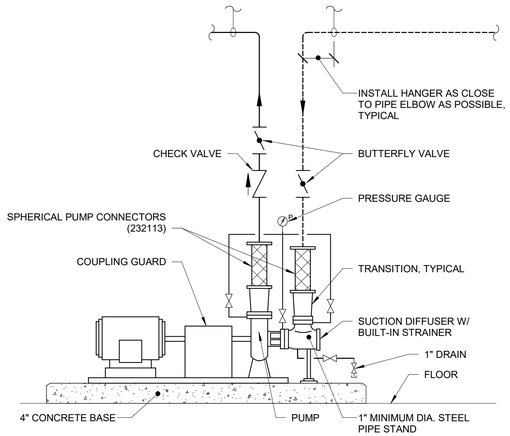


E1	DETAIL - AHU CHILLED WATER COIL PIPING
NOT TO SCALE	



C1	DETAIL - EXPANSION TANK PIPING
NOT TO SCALE	



A1	DETAIL - BASE MOUNTED END SUCTION PUMP PIPING
NOT TO SCALE	

WATER COOLED CHILLER SCHEDULE

GENERAL	UNIT	CH-1	
	TYPE	VARIABLE SPEED MODULAR SCROLL	
	MANUFACTURER	MULTI-STACK	
	MODEL	MSV	
	SERIAL #	--------	
	YEAR INSTALLED	NEW	
	TONS	120	
	RIGGING WEIGHT	6625	
	OPERATING WEIGHT	7135	
	REFRIGERANT TYPE	R-134a	
	REFRIGERANT CHARGE	46.5 lbs.	
	IPLV, KW/TON	0.431	
	MODULE CONFIGURATION	(2) 50 TON (1) 20 TON	
EVAPORATOR	DESIGN GPM	288	
	MIN GPM	96	
	ENT WATER TEMP °F	54.0	
	LVG WATER TEMP °F	44.0	
	MAX PD, FT-H20	14.58	
	FOULING FACTOR	0.0001	
CONDENSER	DESIGN GPM	373	
	MIN GPM	124	
	ENT WATER TEMP °F	85.0	
	LVG WATER TEMP °F	94.3	
	MAX PD, FT-H20	26.76	
	FOULING FACTOR	0.00025	
ELECTRICAL	DISC. SW. FURN BY.	CHILLER MFR.	
	STARTER TYPE	VFD - UNIT MOUNTED	
	V-PH-HZ	480-3-60	
	CHILLER INPUT POWER, KW	85.3	
	MOTOR INPUT POWER, KW	N/A	
	COMPRESSOR RLA	MSV050=27.9 MSV020=22.5	
	MAX CIRCUIT BREAK	200	
	MCA	164	
NOTES			

AIR CONTROL SCHEDULE

SYSTEM	CHILLED WATER
ASSOCIATED PUMPS	CHWP-1/CHWP-2
PIPE MAIN SIZE	5"
AIR SEPARATOR	
MFR-MODEL	TACO 4904AD
INLET/OUTLET	5"
STRAINER	YES
BLADDER-TYPE EXPANSION TANK	
MFR-MODEL	TACO CA-90
SYSTEM HEIGHT, FT	15
STATIC PRESSURE AT TANK, PSI.	6.5
PSI REQ'D. AT HIGHEST SYS POINT	5
TANK PRE-CHARGE PRESSURE	11.5
TANK DIAMETER	16
TANK HEIGHT	30
ACCEPTANCE VOLUME	23
WATERLOGGED WEIGHT (LBS.)	320
ASME PRESSURE RATING	125

HYDRONIC PUMP SCHEDULE

TAG	SYSTEM	MFR.	MODEL	SUCT X DISCH	TYPE	PUMPED FLUID	PERFORMANCE				ELECTRICAL				ELECTRICAL COORDINATION				NOTES
							GPM	HEAD	RPM	NPSH	BHP	NOL HP	MOTOR HP	VOLTS/PH (60 Hz.)	STARTER TYPE	STARTER FURN. BY	BOTH PUMPS RUN?	DISC. SWITCH FURN BY	
CHWP-1	COOLING	GRUNDFOS	LCSE-25957-4P	3 X 2.5	INTEGRAL VARIABLE SPEED	WATER	300	70	1,680	8.86	7.04	7.98	10	480/3	INTEGRAL	------	NO, LEAD-LAG	DIV 26	1
CHWP-2	COOLING	GRUNDFOS	LCSE-25957-4P	3 X 2.5	INTEGRAL VARIABLE SPEED	WATER	300	70	1,680	8.86	7.04	7.98	10	480/3	INTEGRAL	------	NO, LEAD-LAG	DIV 26	1
NOTES:																			
	1. SPEED INPUT SIGNAL FROM BAS																		

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No. 9854
REGISTERED PROFESSIONAL ENGINEER

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MECHANICAL DETAILS AND SCHEDULES

STATE OF MAINE BUREAU OF MOTOR VEHICLES
CHILLER REPLACEMENT
101 Hospital Street, Augusta, ME 04330

M-500

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A	AMPERE
AC	ALTERNATING CURRENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERES INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BAS	BUILDING AUTOMATION SYSTEM
BKBD	BACKBOARD
C	CONDUIT
CAT	CATALOG, CATEGORY
CATV	CABLE TV
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CM	CIRCULAR MILS
COMM	COMMUNICATIONS
CU	MECH CONDENSING UNIT
CU	COPPER
CUH	CABINET UNIT HEATER
DC	DIRECT CURRENT
DDC	DIGITAL DIRECT CONTROL
DN	DOWN
DW	DISHWASHER
DWG	DRAWING
EF	EXHAUST FAN
ELEV	ELEVATOR
EMT	ELECTRICAL METALLIC TUBING
EP	EXPLOSION PROOF
ERU	ENERGY RECOVERY UNIT
EWC	ELECTRIC WATER COOLER
FACP	FIRE ALARM CONTROL PANEL
FB	FLOOR BOX
FLA	FULL LOAD AMPS
FWE	FURNISHED WITH EQUIPMENT
G, GND	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO SELECTOR SWITCH
HP	HORSEPOWER
HVAC	HEATING, VENTILATION AND COOLING UNIT
IDS	INTRUSION DETECTION SYSTEM
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
IR	INFRARED
K	KILO
KCMIL	KILO CIRCULAR MILS
KW	KILOWATT
KVA	KILO VOLT-AMPS
LAN	LOCAL AREA NETWORK
LC	LIGHTING CONTACTOR
LF	LINEAR FEET
LC	LOADCENTER
LCP	LIGHTING CONTROL PANEL
LED	LIGHT EMITTING DIODE
LTG	LIGHTING
LTS	LIGHTS
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MECH	MECHANICAL
MH	MOUNTING HEIGHT
MC	MICROPHONE
MW	MICROWAVE
MLO	MAIN LUG ONLY
MT	MOUNT
MTS	MANUAL TRANSFER SWITCH
MCP	MOTOR CONTROL PANEL
MH	METAL HALIDE
MDP	MAIN DISTRIBUTION PANEL
MIN	MINIMUM
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NF	NON-FUSED
NO	NORMALLY OPEN
NO., #	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OCC	OCCUPANCY
OH	OVERHEAD
P	POLE
PA	PUBLIC ADDRESS
PB	PULLBOX
PH,	PHASE
PIR	PASSIVE INFRARED
PNL	PANELBOARD
P/O	PART OF
PV	PHOTOVOLTAIC
PVC	POLY-VINYL CHLORIDE
REC RECEPT	RECEPTACLE
REF	REFRIGERATOR
RF	RETURN FAN
RGS	RIGID GALVANIZED STEEL
RM	ROOM
RMC	RIGID METAL CONDUIT
RTU	ROOFTOP UNIT
REF	REFRIGERATOR
SF	SUPPLY FAN
SPDT	SINGLE POLE, DOUBLE THROW
SQ	SQUARE
TEL	TELEPHONE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UF	UNDER FLOOR
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
VIF	VERIFY IN FIELD
W	WATT
WP	WEATHERPROOF
WG	WIREGUARD
XFMR	TRANSFORMER

DEMO ABBREVIATIONS

(E)	EXISTING ITEM TO REMAIN
(R)	REMOVE ITEM AND DISPOSE OF PROPERLY
(ER)	RELOCATED ITEM AT NEW LOCATION
(RL)	REMOVE AND RELOCATE

PROJECT NOTES

1. THE SCOPE OF WORK SHALL INCLUDE PROVIDING ALL WORK INDICATED UNLESS OTHERWISE SPECIFICALLY INDICATED AS EXISTING OR WORK BY OTHERS, AND COORDINATION WITH ALL TRADES SCOPE OF WORK AS INDICATED ON THE CONTRACT DOCUMENTS INCLUDING BOTH THE DRAWINGS AND THE SPECIFICATIONS, WHICH ARE COMPLIMENTARY. WORK REQUIREMENTS INDICATED IN ANY CONTRACT DOCUMENT SHALL BE CONSIDERED PART OF THE SCOPE OF WORK, UNLESS SPECIFICALLY INDICATED AS EXISTING OR WORK BY OTHERS.
2. IN GENERAL, WORK REQUIREMENTS ARE NOT INDICATED IN BOTH DOCUMENTS. WHERE DOCUMENTS CONFLICT WITHIN THEMSELVES OR WITH CODES AND REGULATIONS. PROVIDE THE HIGHER QUANTITY AND QUALITY AND FOLLOW THE STRICTER REQUIREMENTS.
3. WORK AT A MINIMUM SHALL BE IN ACCORDANCE WITH OSHA, NFPA STANDARDS, THE ELECTRICAL CODE AND THE LOCAL GOVERNING AUTHORITIES. THE DRAWINGS AND SPECIFICATIONS DO NOT ATTEMPT TO INDICATE ALL WORK REQUIRED BY CODE AND AUTHORITIES. DO NOT INSTALL WORK THAT DOES NOT MEET THE MINIMUM REQUIREMENTS. IF NECESSARY, REQUEST CLARIFICATION FROM ARCHITECT AND ENGINEER BEFORE PROCEEDING.
4. ALL EQUIPMENT SHALL BE INSTALLED IN A NEAT AND PROFESSIONAL MANNER. RECTILINEAR TO BUILDING STRUCTURE.
5. ALL COMPONENTS SHOWN ON THE RISER DIAGRAMS OR DETAILS, BUT NOT ON THE PLAN OR VICE VERSA SHALL BE INCLUDED AS IF SHOWN ON BOTH.
6. IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS TO PROVIDE A WORKING INSTALLATION IN EVERY DETAIL AND ALL ITEMS REQUIRED FOR SUCH AN INSTALLATION SHALL BE PROVIDED WHETHER OR NOT SPECIFICALLY INDICATED OR MENTIONED.
7. VISIT THE SITE TO DETERMINE PRE-EXISTING CONDITIONS AND WORK NECESSARY PRIOR TO SUBMISSION OF BID PRICE. SUBMIT ANY QUESTIONS REQUIRED TO CLARIFY SCOPE PRIOR TO BID. INCLUDE ALL REQUIRED WORK IN BID PRICE.
8. INCLUDE IN BID WHATEVER IS REQUIRED TO MEET SCHEDULE INCLUDING OVERTIME, EXPRESS SHIPPING, EXPEDITING EQUIPMENT, ETC. PLAN FOR PROJECT AND SUBMIT SHOP DRAWING AND ORDER EQUIPMENT IN A TIMELY MANNER; EQUIPMENT SHALL BE BASED ON THE SPECIFIED EQUIPMENT.
9. ANY EQUIPMENT TO BE SUBSTITUTED SHALL BE IDENTIFIED AT THE TIME OF BID. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR SUBSTITUTIONS.
10. ALL ELECTRICAL DEVICES, WHEN INSTALLED, SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION. COVER PLATES SHALL BE INSTALLED AFTER FINISH MATERIALS HAVE BEEN APPLIED.
11. TEST ALL EQUIPMENT AND SYSTEMS INSTALLED TO CERTIFY COMPLIANCE WITH DRAWINGS, SPECIFICATIONS, CODES, LOCAL AUTHORITIES AND REGULATIONS, INCLUDE LABOR AND COSTS FOR TESTING, REVIEWS, COMMISSIONING, APPROVALS AND CERTIFICATIONS.
12. PROVIDE TRAINING TO OWNER ON ALL EQUIPMENT AND SYSTEMS INSTALLED.
13. TEMPORARY LIGHTING AND POWER SHALL BE PROVIDED AS REQUIRED BY OSHA, CODES AND LOCAL AUTHORITIES. REMOVE ALL TEMPORARY FACILITIES PROVIDED AT PROJECT COMPLETION.

INSTALLATION COORDINATION NOTES

1. PRIOR TO ROUGH-IN OF ELECTRICAL PROVISIONS FOR OWNER FURNISHED EQUIPMENT AND EQUIPMENT PROVIDED BY OTHER TRADES, COORDINATE WITH THE GENERAL CONTRACTOR, EQUIPMENT SHOP DRAWINGS AND APPLICABLE EQUIPMENT INSTALLER FOR EXACT LOCATION AND WIRING REQUIREMENTS. PROVIDE ALL NECESSARY EQUIPMENT, WIRING AND ACCESSORIES FOR A COMPLETE INSTALLATION. MAKE ALL FINAL CONNECTIONS AS REQUIRED, I.E. POWER, CONTROL, INTERLOCK, ETC.
2. DISCONNECT, REMOVE, RELOCATE, AND RECONNECT ELECTRICAL CONDUIT, WIRING, DEVICES, BOXES, FIXTURES, EQUIPMENT, ETC. AS INDICATED AND AS REQUIRED TO FACILITATE THE WORK OF DIVISION 26 AND OTHER DIVISIONS. THESE DRAWINGS ARE NOT INTENDED TO INDICATE ALL ITEMS TO BE REMOVED.
3. ELECTRICAL EQUIPMENT, RACEWAYS AND OUTLETS MOUNTED TO AND OR INSTALLED IN OWNER FURNISHED FURNITURE SHALL BE COORDINATED WITH THE EQUIPMENT AND FURNITURE INSTALLERS AND THE GENERAL CONTRACTOR PRIOR TO ROUGH-IN. EXCEPT WHERE INDICATED OR REQUIRED OTHERWISE.
4. THE LOCATION OF EQUIPMENT, OUTLETS, ETC. AS GIVEN ON THE DRAWINGS IS APPROXIMATE. IT SHALL BE UNDERSTOOD THAT THESE LOCATIONS ARE SUBJECT TO MODIFICATION AS MAY BE FOUND NECESSARY OR DESIRABLE AT THE TIME OF INSTALLATION IN ORDER TO MEET PROJECT REQUIREMENTS. SUCH CHANGES SHALL BE MADE WITHOUT EXTRA CHARGE.
5. IF EXACT LOCATION, MOUNTING OR RACEWAY ROUTING ARE NOT INDICATED OR ARE NOT CLEAR OR CONFLICT (LOCATION OR HEIGHT) COORDINATE WITH OTHER TRADES AND REQUEST CLARIFICATION PRIOR TO ROUGH-IN OR INSTALLATION. DRAWINGS ARE DIAGRAMMATIC ONLY. EXACT LOCATION, MOUNTING HEIGHTS OR EQUIPMENT AND ROUTING OF RACEWAYS SHALL BE COORDINATED WITH THE EQUIPMENT REQUIREMENTS AND FIELD CONDITIONS.
6. WHERE LOADS ARE ADDED TO EXISTING BRANCH CIRCUITS, VERIFY THAT THE EXISTING CIRCUITS HAVE ADEQUATE CAPACITY TO SUPPORT THE ADDITIONAL LOAD WITHOUT EXCEEDING SPECIFIED MAXIMUM LOAD.
7. UNLESS OTHERWISE DIRECTED, PROVIDE ALL NEW POWER DISTRIBUTION EQUIPMENT WITH AIC RATINGS THAT MATCH OR EXCEED THE AIC RATING OF THE NEXT ACTIVE EXISTING UPSTREAM OVER-CURRENT PROTECTIVE DEVICE SERVING THE PANEL WHEN SERVED DIRECTLY BY ITS SOURCE (E.G. NO TRANSFORMER) OR PROVIDE AIC RATING THAT EXCEEDS BY 10% THE MAXIMUM LET THROUGH FAULT CURRENT (UNDER INFINITE PRIMARY BUSS) OF THE NEXT ACTIVE UPSTREAM TRANSFORMER (EXISTING OR NEW) SERVING THE RESPECTIVE PANEL.
8. ALL NEW PANELS SHALL BE FULLY RATED FOR THE DESIGNATED AIC VALUE; PANELS UTILIZING SERIES RATINGS WILL NOT BE ACCEPTABLE. NEW CIRCUIT BREAKERS PROVIDED IN EXISTING PANELS SHALL BE PROVIDED WITH AIC RATINGS THAT MATCH OR EXCEED THE HIGHEST RATED OVER-CURRENT PROTECTIVE DEVICE WITHIN THE RESPECTIVE EXISTING PANEL.
9. SUBMIT SHORT CIRCUIT STUDY WITH POWER DISTRIBUTION EQUIPMENT SUBMITTALS FOR REVIEW AND APPROVAL. IN THE STUDY DEMONSTRATE THAT THE AIC RATING SELECTIONS ARE PROPERLY INTEGRATED AND COORDINATED WITH THE EXISTING AND NEW POWER DISTRIBUTION EQUIPMENT. CONFIRM THAT THE AIC RATING SELECTIONS HAVE INCORPORATED THE AVAILABLE FAULT DUTY VALUES OBTAINED FROM THE UTILITY COMPANY FOR THE PROJECTS ELECTRICAL SERVICE POINT OF COMMON COUPLING.
10. SUBMIT OVER-CURRENT PROTECTIVE DEVICE COORDINATION STUDY, FOR ALL NEW POWER DISTRIBUTION EQUIPMENT, WITH THE POWER DISTRIBUTION EQUIPMENT SUBMITTALS FOR REVIEW AND APPROVAL. INCLUDE THE NEXT ACTIVE EXISTING UPSTREAM OVER-CURRENT PROTECTIVE DEVICES, IN THE STUDY ANALYSIS, WHEN PROJECT IS WITHIN AN EXISTING FACILITY.
11. SUBMIT ARC FLASH REPORT, FOR ALL NEW POWER DISTRIBUTION EQUIPMENT, WITH POWER DISTRIBUTION EQUIPMENT SUBMITTALS FOR REVIEW AND APPROVAL.

WIRING NOTES

1. UNLESS OTHERWISE INDICATED ON PLANS OR IN SPECIFICATIONS; ALL CONDUCTORS, POWER DISTRIBUTION EQUIPMENT BUSSING AND TRANSFORMER WINDINGS SHALL BE FABRICATED OF 98% CONDUCTIVE COPPER MATERIAL.
2. WIRING IS INDICATED ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.
3. BRANCH CIRCUIT WIRING NOT SHOWN. CIRCUITING SHALL IN ACCORDANCE WITH APPLICABLE CODES AND STANDARD PRACTICE. PROVIDE A 20A, 1P CIRCUIT BREAKER FOR EACH LIGHTING AND RECEPTACLE CIRCUIT UNLESS OTHERWISE INDICATED OR NOTED. CONNECT NO MORE THAN SIX DUPLEX CONVENIENCE RECEPTACLES PER BRANCH CIRCUIT. CONNECTED LOAD ON LIGHTING CIRCUITS SHALL NOT EXCEED 12 AMPS.
4. ALL WIRING SHALL BE RUN CONCEALED UNLESS SPECIFIED OTHERWISE. ALL EXPOSED WIRING INCLUDING THAT WHICH IS INSTALLED ABOVE BUT IS VISIBLE FROM BELOW, PARTIALLY OR FULLY OPEN CEILING, SHALL BE INSTALLED IN CONDUIT OR RACEWAYS. REFER TO SPECIFICATIONS FOR ACCEPTABLE WIRING METHODS.
5. WIRING AND CONDUIT SHALL BE REQUIRED FOR ALL SWITCHES, AND OUTLETS INDICATED WITH CIRCUIT NUMBERS. PROVIDE ¾" CONDUIT , 3#12 UNLESS OTHERWISE INDICATED (1 PHASE, 1 NEUTRAL AND 1 GROUND). WIRE AND CONDUIT SIZES ON HOME RUNS SHALL BE CONTINUOUS THROUGHOUT CIRCUIT. REFER TO VOLTAGE DROP CHART ON SCHEDULE SHEET, ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.
6. RACEWAYS SHALL BE LIMITED TO SIX CURRENT CARRYING CONDUCTORS (PHASE AND NEUTRALS) AND GROUNDING CONDUCTOR. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH SINGLE-PHASE RECEPTACLE OR LIGHTING CIRCUIT, UNLESS OTHERWISE INDICATED OR IF AN OVERSIZED NEUTRAL IS SPECIFIED. CIRCUITS WITH SHARED NEUTRALS SHALL BE PROVIDED WITH CIRCUIT BREAKERS THAT HAVE A COMMON TRIP (E.G. FURNITURE WHIPS)
7. MARK ALL CONDUITS AND JUNCTION BOXES WITH PERMANENT MARKER INDICATING PANEL AND CIRCUIT NUMBER OF CONDUCTORS CONTAINED WITHIN. LABEL WHERE CONDUITS ENTER PANELS, WIRE WAYS, PULL BOXES, ETC. LABEL EMPTY CONDUITS WITH SYSTEM (VOICE, DATA, SECURITY, ETC.) AND SOURCE OF CONDUIT.
8. COORDINATE WITH OWNER TO DETERMINE WHICH RECEPTACLES AND ITEMS OF EQUIPMENT REQUIRE STANDBY GENERATOR POWER.
9. ELECTRICAL WORK NOT SERVING STAIRWELLS SHALL NOT PASS THROUGH A STAIR ENCLOSURE UNLESS AN APPROVED RATED SOFFIT IS PROVIDED TO MAINTAIN FIRE AND SMOKE RATING.
10. ALL RACEWAYS CROSSING EXPANSION JOINTS SHALL BE EQUIPPED WITH EXPANSION FITTINGS.
11. PROVIDE WATERTIGHT AND GAS TIGHT SEALS INSIDE AND OUTSIDE OF CONDUITS THAT PENETRATE THE BUILDING BELOW GRADE. O.Z. GEDNEY OR APPROVED EQUAL. PROVIDE WEATHER TIGHT SEAL AT PENETRATIONS ABOVE GRADE.
12. PROVIDE NRTL LISTED SMOKE AND FIRE SEALS AT ALL PENETRATIONS THROUGH FLOORS OR FULL HEIGHT (FLOOR TO FLOOR) WALLS.

SYSTEM POWER WIRING NOTES

1. ALL VIDEO PROJECTOR, CAMERA AND MONITOR POWER OUTLETS AND THEIR ASSOCIATED COMPUTER POWER OUTLETS FEEDING THE VIDEO SOURCE ARE TO BE CONNECTED TO THE SAME PHASE TO ELIMINATE THE POTENTIAL FOR VIDEO INTERFERENCE BETWEEN VIDEO SOURCE AND EQUIPMENT. COORDINATE ALL POWER WIRING FOR SYSTEM EQUIPMENT WITH THE SYSTEM INSTALLER PRIOR TO INSTALLATION

RECEPTACLE COLOR CODE NOTES

UNLESS OTHERWISE INDICATED PROVIDE 20A HEAVY DUTY GRADE RECEPTACLES WITH COLOR CODE AS FOLLOWS:

1. ON GENERATOR POWER – RED
2. ON UPS POWER – BLUE
3. ISOLATED GROUND – ORANGE
4. ON NORMAL POWER – IVORY OR AS SELECTED BY ARCHITECT

MOUNTING NOTES

1. DO NOT SCALE THE DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS AND EXISTING CONDITIONS FOR EXACT DIMENSIONS.
2. INSTALL ALL ELECTRICAL DEVICES (FIRE ALARM, SWITCHES, RECEPTACLES, WORK BOXES, JUNCTION BOXES, EXIT SIGNS, LUMINAIRES, ETC.) IN THE LOCATIONS IDENTIFIED OR DIMENSIONS ON THE ARCHITECTURAL PLANS, DETAILS, OR ELEVATIONS.
3. IF THE DEVICE LOCATION IS NOT SPECIFICALLY SHOWN ON ARCHITECTURAL DRAWINGS, FOLLOW THE GUIDELINES LISTED BELOW:
4. INSTALL NEARBY DEVICES ON ONE COMMON VERTICAL CENTERLINE
5. INSTALL ADJACENT TO DEVICES LINED UP WITH A COMMON BOTTOM LINE.
6. INSTALL DEVICES AT INDICATED HEIGHT AS APPLICABLE UNLESS OTHERWISE NOTED. ALL MOUNTING HEIGHTS SHALL BE MEASURED FROM FINISHED FLOOR TO CENTERLINE OF DEVICE EXCEPT AS INDICATED BY NOTE 7.
7. ON MASONRY WALLS LINE UP THE BOTTOM OF THE DEVICE WITH A MASONRY JOINT AS CLOSE TO THE INDICATED HEIGHT AS PRACTICAL.
8. INSTALL DEVICES IN SAME AREA AT THE SAME HEIGHT.
9. MOUNT PANELS SIX FEET TO THE TOP OF THE PANEL OR ANNUNCIATOR/ FA GRAPHIC.
10. MOUNT AT 8 FOOT TO BOTTOM FOR SIGNAGE, EMERGENCY LIGHTING, CLOCKS, SECURITY SENSORS, WALL MOUNTED OCCUPANCY SENSORS MODIFIED AS FOLLOWS: 4" FROM TOP OF DEVICE TO CEILING AND 4" ABOVE DOOR FRAMES.
11. LOCATE CONTROL DEVISE AT LEAST 18" FROM AN INSIDE CORNER.
12. SUPPORT WORK FROM THE BUILDING STRUCTURE.
13. IN FINISHED AREAS ELECTRICAL WORK SHALL BE INSTALLED CONCEALED, RECESSED INTO WALLS OR INSTALLED ABOVE HUNG CEILINGS UNLESS OTHERWISE INDICATED.
14. DO NOT INSTALL OUTLETS BACK TO BACK. PROVIDE 24" SPACING IN FIRE RATED WALLS.
15. PROVIDE ELECTRICAL OUTLET PLATE GASKETS SEALS AT RECEPTACLES, SWITCHES AND OTHER ELECTRICAL BOXES ON EXTERIOR WALLS AND INTERIOR WALLS BETWEEN CONDITIONED AND NON-CONDITIONED SPACES.

D2 ELECTRICAL GENERAL NOTES

ELECTRICAL LEGEND

- PANELBOARD ~ FLUSH MOUNTED
- PANELBOARD ~ SURFACE MOUNTED
- DISCONNECT SWITCH
- CABLE TRAY
- MOTOR OR FAN
- JUNCTION BOX, CEILING OR WALL MOUNTED. MAKE CONNECTION TO RESPECTIVE EQUIPMENT. COORDINATE EXACT TERMINATION POINT IN FIELD OR THROUGH APPROVED SUBMITTALS.
- T# TRANSFORMER ~ SEE TRANSFORMER SCHEDULE
- INDICATES DEDICATED CIRCUIT OR HOMERUN BACK TO RESPECTIVE PANEL ~ (2)#12+(1)#12G UNO. REFER TO EQUIPMENT SCHEDULES AND PANELBOARD SCHEDULES FOR ADDITIONAL INFORMATION.
- P DIVIDED POWER POLE FOR SYSTEM FURNITURE POWER AND DATA WIRING
- P MOTORIZED DOOR OPERATOR AND PUSH PADDLE ~ FURNISHED BY DIVISION 08, WIRED BY DIVISION 26
- CB ENCLOSED CIRCUIT BREAKER
- ATS AUTOMATIC TRANSFER SWITCH
- #V/D SF SYSTEMS FURNITURE FEED WITH WHIPS, WALL MOUNT OR MOUNTED AT POWER POLE WHERE INDICATED ~ PROVIDE SINGLE GANG JUNCTION BOX 18" AFF FOR POWER, PROVIDE DOUBLE GANG JUNCTION BOX 18" AFF WITH EMPTY 1"CONDUIT WITH PULLSTRING FOR VOICE/DATA CABLING UP TO 6" ABOVE NEAREST ACCESSIBLE CEILING
- TPS TRIPLE SWITCH FOR MANUAL TRANSFER FROM PERMANENT GENERATOR TO TEMPORARY ROLL-UP GENERATOR WITH CONNECTION (CAM-LOK) PROVISIONS FOR ROLL-UP UNIT (ESL OR EQUAL)
- PH IN-GRADE PULL HOLE, REFER TO PLANS FOR REQUIRED SIZE
- MOTOR RATED SWITCH WITH THERMAL OVERLOAD PROTECTION

SINGLE RECEPTACLES

- LP RC 30" SPECIAL RECEPTACLE ~ REFER TO SPECIAL RECEPTACLE SCHEDULE FOR AMPACITY, NEMA CONFIGURATION, WIRE SIZE AND ADDITIONAL RELATED INFORMATION FOR ASSOCIATED LETTER
- OVERHEAD SPECIAL RECEPTACLE DROP ~ REFER TO SPECIAL RECEPTACLE SCHEDULE FOR AMPACITY, NEMA CONFIGURATION, WIRE SIZE AND ADDITIONAL RELATED INFORMATION FOR ASSOCIATED LETTER

NOTES:

1. PROVIDE MATCHING CORD AND PLUG FOR SINGLE RECEPTACLES
2. MOUNT EXTERIOR RECEPTACLES WITH CENTERLINE 24" AFG UNO
3. MOUNT RECEPTACLES WITH CENTERLINE 18" AFF UNO. (30") INDICATES DEVICE MOUNTING HEIGHT WHEN NOT MOUNTED AT 18".
4. (RC) INDICATES DEVICES IS MOUNTED IN RESPECTIVE ADJACENT RECEPTACLE RACEWAY. (LP) INDICATES DEVICE IS MOUNTED IN OVERHEAD CEILING LAB PANEL.
5. REFER TO DETAIL ON LAB EQUIPMENT MATRIX SHEET FOR REQUIRED P-TOUCH LABELING.

FLOOR AND CEILING DEVICES

- OVERHEAD RECEPTACLE DROP, DOUBLE DUPLEX

RECEPTACLES

- DUPLEX RECEPTACLE ~ 20A, 125V, 2P, 3W, NEMA 5-20R
- DOUBLE DUPLEX RECEPTACLE
- GFCI DUPLEX RECEPTACLE, MOUNT 44" AFF UNO
- GFCI DOUBLE DUPLEX RECEPTACLE, MOUNT 44" AFF UNO
- EWC GFCI RECEPTACLE FOR ELECTRIC WATER COOLER - COORDINATE LOCATION WITH DIVISION 22.
- WP GFCI RECEPTACLE WITH WEATHERPROOF COVER
- WP GFCI RECEPTACLE IN WP ENCLOSURE ON ROOF
- W TECHNOLOGY DEVICES ~ REFER TO TECHNOLOGY SCHEDULE

NOTES:

1. MOUNT RECEPTACLES WITH CENTERLINE 18" AFF UNO
2. MOUNT EXTERIOR RECEPTACLES WITH CENTERLINE 24" AFG UNO

1. REFER TO FLOOR PLANS FOR SCOPE OF WORK AREA. REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR THE ADDITIONAL DEMOLITION SCOPE OF WORK.
2. REMOVE ALL ELECTRICAL DEVICES WITHIN A DEFINED DEMOLITION AREA AS IDENTIFIED ON PLANS WITH NOTES AND/OR SCOPE BOUNDARY LINES, UNLESS NOTED OR INDICATED OTHERWISE. DEMOLITION SHALL INCLUDE BUT NOT BE LIMITED TO WIRING DEVICES, OUTLET BOXES, PULL BOXES, LIGHTING FIXTURES AND SWITCHES, WIRING AND CONDUIT, TELECOMMUNICATIONS, OUTLETS, ETC.
3. IN GENERAL, ONLY EXISTING ITEMS TO REMAIN OR BE RELOCATED ARE INDICATED ON THE DRAWINGS.
4. EXISTING FIRE ALARM SYSTEM SHALL REMAIN, EXCEPT WHERE SYSTEM COMPONENTS ARE LOCATED IN WALLS TO BE REMOVED. WHERE WALLS ARE TO BE REMOVED, REMOVE AND RELOCATE EXISTING FIRE ALARM COMPONENTS AS INDICATED AND AS REQUIRED. EXISTING FIRE ALARM COMPONENTS ARE GENERALLY NOT SHOWN.
5. DISCONNECT AND REMOVE ALL WIRING FOR EQUIPMENT TO BE REMOVED BACK TO THE POINT OF CONNECTION. NOTHING SHALL BE ABANDONED IN PLACE.
6. VERIFY ALL EXISTING SOURCES OF POWER TO EQUIPMENT PRIOR TO FINAL REMOVAL.
7. COORDINATE ALL SHUTDOWN PROCEDURES WITH THE OWNER PRIOR TO DISCONNECTING ANY CIRCUITS.
8. PROVIDE BLANK COVER PLATES FOR REMOVED POWER AND COMMUNICATIONS OUTLETS IN EXISTING WALLS TO REMAIN.
9. THE DEMOLITION FLOOR PLANS ARE REPRESENTATIVE AND DO NOT SHOW ALL EXISTING WALLS AND EQUIPMENT.
10. THE WORK INCLUDES DISPOSAL OF ALL REMOVED ELECTRICAL ITEMS INCLUDING BALLASTS AND LAMPS. LEGALLY DISPOSE OF ALL HAZARDOUS MATERIALS

A1 ABBREVIATIONS | A2 POWER DISTRIBUTION | A4 RECEPTACLES | A6 DEMOLITION NOTES

12" = 1'-0"

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REVISIONS

No.	DATE	BY	DESCRIPTION

Date: 12-22-2020
Drawn By: PMC
Checked By: BTG
Project Mgr: ASD
Project No: 20051
Cad File:
Graphic Scale: 0" 1"

ELECTRICAL LEGEND

STATE OF MAINE BUREAU OF MOTOR VEHICLES
CHILLER REPLACEMENT
101 Hospital Street, Augusta, ME 04330

ISSUED FOR BID

E-000

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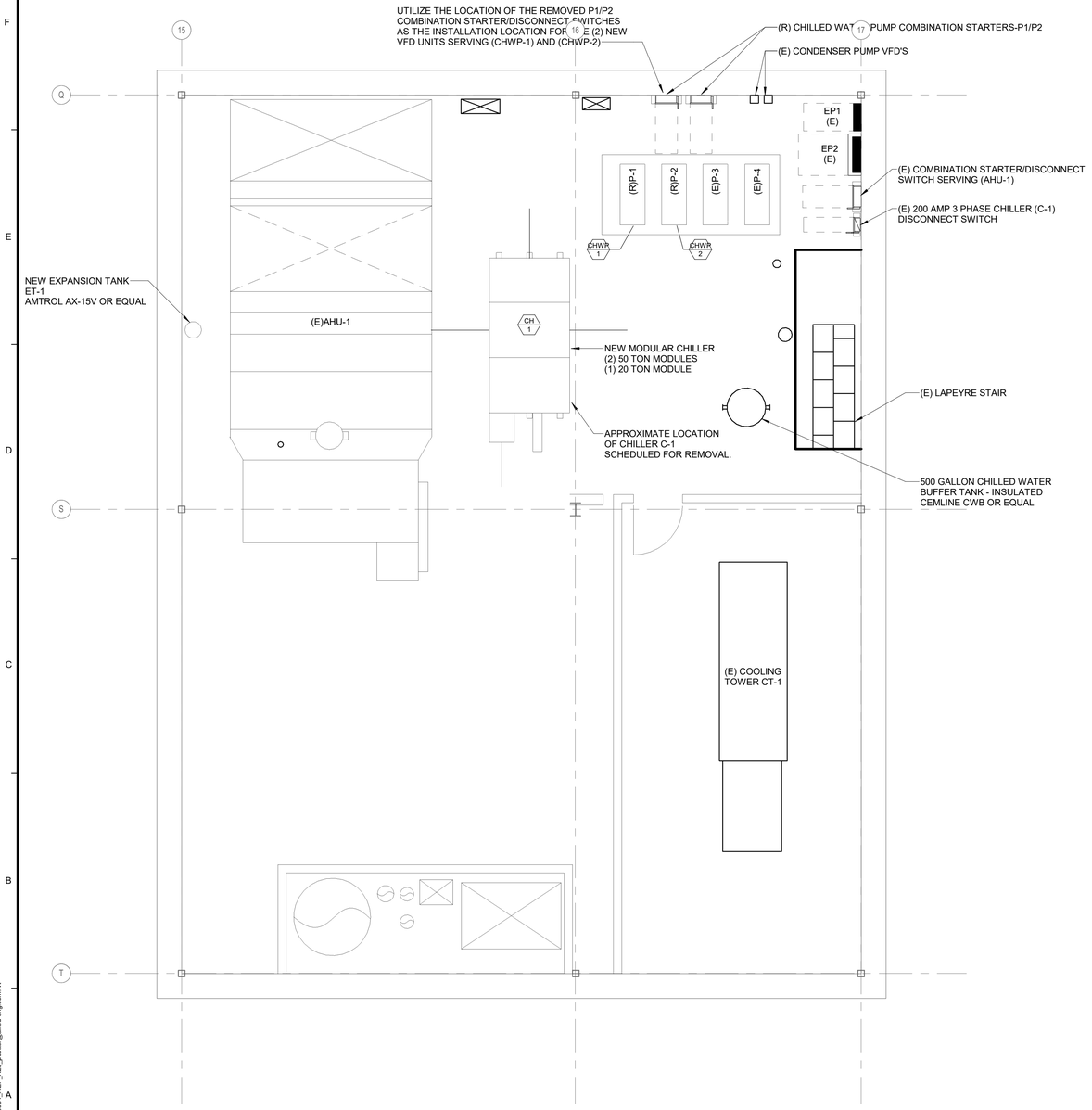

PROPOSED ELECTRICAL MODIFICATIONS:

A. BMV CHILLER
   a. MAINTAIN POWER WIRING FROM EXISTING PANEL HPA/EP2 (225AMP, 480/277V, 3PH, 4W) TO EXISTING RESPECTIVE STARTERS AND VFD UNITS SERVING PUMPS P3/P4 (CONDENSER WATER PUMPS)
   b. DISCONNECT AND REMOVE THE EXISTING 200 AMP, 3 PHASE FEEDER FROM THE EXISTING CHILLER (C-1)BACK TO THE EXISTING 200 AMP 3 POLE DISCONNECT SWITCH (TO BE MAINTAINED) IN THE PENTHOUSE. THE EXISTING CHILLER (C-1) SOURCE PANEL IS 480/277 VOLT, THREE PHASE, FOUR WIRE SQUARE D PANEL (MDP# 1) LOCATED IN THE GROUND FLOOR MAIN ELECTRICAL ROOM.
   c. MAINTAIN THE 200 AMP, THREE PHASE, FOUR WIRE FEEDER AND (3") CONDUIT RUN FROM THE EXISTING DISCONNECT SWITCH IN THE PENTHOUSE DOWN TO (MDP#1) IN THE MAIN ELECTRICAL ROOM.
   d. MAINTAIN THE EXISTING 200 AMP, 3 POLE CIRCUIT BREAKER IN EXISTING (MDP#1).
   e. REMOVE THE (3") CONDUIT RUN FROM THE EXISTING 200 AMP DISCONNECT SWITCH TO THE CHILLER (C-1) POWER TERMINALS.
   f. INSTALL NEW 200 AMP THREE PHASE, FOUR WIRE FEEDER (4#3/0 AND 1#6 GND – 2" CONDUIT) FROM THE EXISTING 200A DISCONNECT SWITCH IN THE PENTHOUSE TO THE POWER TERMINAL BOX OF THE NEW CHILLER.
   g. TERMINATE NEW FEEDER AT THE EXISTING 200 AMP DISCONNECT SWITCH IN THE PENTHOUSE AND AT POWER ENTRY UNIT ON NEW CHILLER. UTILIZE FLEXIBLE CONDUIT CONNECTION AT CHILLER.

B. P-1/P-2
   a. DISCONNECT AND REMOVE THE WIRING AND THE EXISTING COMBINATION DISCONNECT SWITCH/VFD UNIT FOR EACH 7.5 HP MOTOR BEING REMOVED BACK TO SOURCE (PANEL EP2).
   b. THE EXISTING 20A-3P CIRCUIT BREAKER AND FEEDER SHALL BE REMOVED AND REPLACED WITH A NEW 30A-3P CIRCUIT BREAKER FOR EACH.
   c. PROVIDE NEW 30A THREE PHASE BRANCH CIRCUIT WIRING AND TERMINATIONS, FOR EACH, FROM NEW CIRCUIT BREAKER TO THE NEW COMBINATION DISCONNECT SWITCH/VFD (FWE). (3#10 AND 1#10 GND - 3/4" CONDUIT)
   d. PROVIDE NEW 30A THREE PHASE BRANCH CIRCUIT WIRING AND TERMINATIONS, FOR EACH, FROM NEW COMBINATION DISCONNECT SWITCH/VFD (FWE) TO NEW 10HP MOTOR. (3#10 AND 1#10 GND - 3/4" CONDUIT). UTILIZE FLEXIBLE CONNECTIONS AT THE MOTORS.

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ELECTRICAL PART PLAN

STATE OF MAINE BUREAU OF MOTOR VEHICLES
CHILLER REPLACEMENT
101 Hospital Street, Augusta, ME 04330

E-100

ISSUED FOR BID

A1 | ELECTRICAL PART PLAN - PENTHOUSE
1/4" = 1'-0"

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