

GENERAL	
DESIGNATION	DESCRIPTION
	DETAIL OR ENLARGED PLAN (SAME DRAWING)
	DETAIL OR ENLARGED PLAN (DIFFERENT DRAWING)
	SECTION OR ELEVATION (SAME DRAWING)
	SECTION OR ELEVATION (DIFFERENT DRAWING)
	(HEAVY LINES) - NEW PIPING/DUCTWORK/EQUIPMENT
	(THIN LINES) - EXISTING PIPING/DUCTWORK/EQUIPMENT TO REMAIN
	(THIN HATCHED LINES) - EXISTING PIPING/DUCTWORK/EQUIPMENT TO BE DEMOLISHED
	POINT OF CONNECTION BETWEEN NEW/DEMO WORK AND EXISTING MATCH LINE

RISER TAGS	
DESIGNATION	DESCRIPTION
	DESCRIPTION RISER NUMBER
CD	CONDENSATE DRAIN
CHW	CHILLED WATER
CR	CONDENSATE (STEAM)
CW	CONDENSER WATER
FO	FUEL OIL
GLY	GLYCOL
HW	HOT WATER
MCV	MEDICAL GAS/VACUUM
PCHW	PRIMARY CHILLED WATER
R	REFRIGERANT
SCHW	SECONDARY CHILLED WATER
STM	STEAM

EQUIPMENT TAGS	
DESIGNATION	DESCRIPTION
ACC	AIR-COOLED CHILLER
ACCU	AIR-COOLED CONDENSING UNIT
ACU	AIR CONDITIONING UNIT (AIR-COOLED OR WATER-COOLED)
AHU	AIR HANDLING UNIT
AP	MEDICAL GAS/VACUUM AREA ALARM PANEL
B	BOILER
P	PUMP

PIPING LEGEND	
DESIGNATION	DESCRIPTION
BBD	BOILER BLOW DOWN
BF	BOILER FEED
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CD	CONDENSATE DRAIN
DCW	DOMESTIC COLD WATER
D	DRAIN
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HTWR	HIGH TEMPERATURE HOT WATER RETURN
HTWS	HIGH TEMPERATURE HOT WATER SUPPLY
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LPS(C)	LOW PRESSURE CLEAN HUMIDIFICATION STEAM
HWR	LOW TEMPERATURE HOT WATER RETURN
HWS	LOW TEMPERATURE HOT WATER SUPPLY
MU	MAKE-UP WATER
PCHWR	PRIMARY CHILLED WATER RETURN
PCHWS	PRIMARY CHILLED WATER SUPPLY

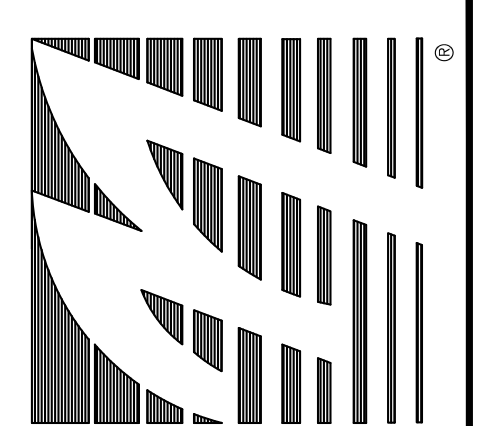
PIPEWORK SYMBOLS	
DESIGNATION	DESCRIPTION
	PUMP
	BALL VALVE
	BUTTERFLY VALVE
	DOUBLE SPHERE FLEXIBLE CONNECTOR
	BALANCING VALVE
	2-WAY CONTROL VALVE (ELECTRIC OR ELECTRONIC ACTUATION)
	2-WAY BUTTERFLY CONTROL VALVE (ELECTRIC OR ELECTRONIC ACTUATION)
	PRESSURE REDUCING VALVE
	PRESSURE RELIEF OR SAFETY VALVE
	SWING GATE CHECK VALVE
	SPRING CHECK VALVE
	TRIPLE DUTY VALVE
	HOSE END DRAIN VALVE
	Y-TYPE STRAINER (WITH BLOWOFF VALVE)
	ELECTRIC HEAT TRACE
	FLEXIBLE CONNECTOR
	DRAIN WITH BALL VALVE, HOSE END CONNECTION
	AIR VENT (AUTOMATIC)
	AIR VENT (MANUAL)
	FLOW METER, ORIFICE
	MANUAL BALANCING VALVE WITH BALL SHUT OFF VALVE
	MANUAL BALANCING VALVE WITH BUTTERFLY SHUT OFF VALVE
	THERMOMETER
	HYDRONIC PRESSURE GAUGE & NEEDLE VALVE
	UNIVERSAL PORT FOR PRESSURE GAUGE OR THERMOMETER WELL

AUTOMATIC TEMPERATURE CONTROL SYMBOLS	
DESIGNATION	DESCRIPTION
	ROOM TEMPERATURE SENSOR
	PIPE INSERTION TEMPERATURE SENSOR
	DIFFERENTIAL PRESSURE SWITCH
	MOTOR STARTER
	VARIABLE FREQUENCY DRIVE
	ELECTRIC MOTOR VALVE ACTUATOR
	DIFFERENTIAL PRESSURE SENSOR
	FLOW SWITCH
	PRESSURE SWITCH
	TEMPERATURE TRANSMITTER
	TEMPERATURE/HUMIDITY TRANSMITTER

PIPEWORK FITTINGS	
DESIGNATION	DESCRIPTION
	CAP
	CONNECTION, BOTTOM
	CONNECTION, TOP
	ELBOW, 90°
	ELBOW TURNED UP
	ELBOW TURNED DOWN
	ELBOW, REDUCING (SHOW SIZES)
	ELBOW, LONG RADIUS
	ELBOW, SIDE OUTLET, OUTLET UP
	ELBOW, SIDE OUTLET, OUTLET DOWN
	LATERAL BRANCH
	REDUCER, CONCENTRIC
	INCREASER, CONCENTRIC
	REDUCER, ECCENTRIC STRAIGHT INVERT
	REDUCER, ECCENTRIC STRAIGHT CROWN
	TEE
	TEE, OUTLET UP
	TEE, OUTLET DOWN
	TEE, REDUCING (SHOW SIZES)
	TEE, SIDE OUTLET, OUTLET UP
	TEE, SIDE OUTLET, OUTLET DOWN
	UNION, SCREWED
	PITCH OF PIPE - RISE (R), DROP (D)

ABBREVIATIONS	
DESIGNATION	DESCRIPTION
ABV	ABOVE
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AS	AIR SEPARATOR
BAS	BUILDING AUTOMATION SYSTEM
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DPS	DIFFERENTIAL PRESSURE SWITCH
DWG	DRAWING
EL	ELEVATION
ELEC	ELECTRICAL
EQ	EQUIPMENT
ET	EXPANSION TANK
F OR °F	FAHRENHEIT
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FT	FEET OR FOOT
GA	GAUGE
GAL	GALLONS
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
HTG	HEATING
HVAC	HEATING VENTILATING AND AIR CONDITIONING
ID	INSIDE DIAMETER
KW	KILOWATT
LRA	LOCK ROTOR AMPS
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTDOOR AIR
PSI(G)	POUNDS PER SQUARE INCH (GAUGE)
RD	ROOF DRAIN
RPM	REVOLUTIONS PER MINUTE
TYP	TYPICAL
VFD	VARIABLE FREQUENCY DRIVE
V	VENT
W/	WITH
W/O	WITHOUT
WG	WATER GAUGE

DUCTWORK SYMBOLS	
DESIGNATION	DESCRIPTION
	ACCESS DOOR OR PANEL, VERTICAL OR HORIZONTAL
	ACOUSTICAL LINING; DIMENSIONS SHOWN ARE CLEAR AIR PATH
	DUCT OFFSET (DOWN) IN DIRECTION OF FLOW
	DUCT OFFSET (UP) IN DIRECTION OF FLOW
	RECTANGULAR SUPPLY DUCT ELBOW TURNED DOWN
	RECTANGULAR SUPPLY DUCT ELBOW TURNED UP
	RECTANGULAR EXHAUST/RETURN DUCT ELBOW TURNED DOWN
	RECTANGULAR EXHAUST/RETURN DUCT ELBOW TURNED UP
	ROUND DUCT ELBOW TURNED DOWN
	ROUND DUCT ELBOW TURNED UP
	DIRECTION OF FLOW
	DUCT AIR PATH SIZE, FIRST FIGURE IS SIDE SHOWN
	FLEXIBLE CONNECTION
	FLEXIBLE DUCT
	DUCT SECTION, POSITIVE PRESSURE, FIRST FIGURE IS TOP
	DUCT SECTION, NEGATIVE PRESSURE, FIRST FIGURE IS TOP
	TRANSITION WITH DUCT SIZE
	RECTANGULAR ELBOWS WITH TURNING VANES
	RECTANGULAR ELBOWS WITHOUT TURNING VANES
	DUCT PENETRATION THROUGH BEAM
	CAPPED DUCT - RECTANGULAR OR ROUND
	MOTOR OPERATED DAMPER
	CEILING-MOUNTED SUPPLY AIR TERMINAL DEVICE (4-WAY THROW)
	CEILING-MOUNTED SUPPLY AIR TERMINAL DEVICE (3-WAY THROW, SHADED AREA INDICATES BLANKED OFF SIDE)
	CEILING-MOUNTED SUPPLY AIR TERMINAL DEVICE (2-WAY THROW, SHADED AREAS INDICATE BLANKED OFF SIDES)
	CEILING-MOUNTED EXHAUST/RETURN AIR TERMINAL DEVICE
	WALL OR DUCT MOUNTED EXHAUST/RETURN AIR TERMINAL DEVICE
	WALL OR DUCT MOUNTED SUPPLY AIR TERMINAL DEVICE
	TRANSFER AIR DOOR GRILLE
	UNDERCUT DOOR
	WALL MOUNTED TRANSFER AIR ASSEMBLY INCLUDING SHEETMETAL SLEEVE AND TWO (2) REGISTERS
	LINEAR SUPPLY AIR DIFFUSER
	LINEAR RETURN AIR DIFFUSER
	CENTRIFUGAL FAN
	PROPELLER FAN
	AXIAL FAN
	VOLUME DAMPER
	SMOKE DAMPER
	FIRE DAMPER
	COMBINATION SMOKE/FIRE DAMPER
	HUMIDIFIER



Grumman/Butkus Associates
 Energy Efficiency Consultants and Sustainable Design Engineers
 820 Davis St, Ste 300
 Evanston, Illinois 60201 4446
 847 328-3555 www.grummanbutkus.com
 Copyright © 2013 Grumman/Butkus Associates Illinois Registration # 04-000266

ISSUES & REVISIONS	NO.	DATE	DESCRIPTION
		11/02/23	ISSUED FOR BID
			ISSUED FOR PERMIT

MECHANICAL SYMBOLS AND ABBREVIATIONS
 JAIL CHILLER REPLACEMENT
 McHENRY COUNTY GOVERNMENT CENTER
 2200 NORTH SEMINARY AVENUE
 WOODSTOCK, IL 60098

DATE	SCALE	NO. SCALE	NO. SCALE
10/27/23			

DATE	SCALE	NO. SCALE	NO. SCALE
10/27/23			

MO.1

ACC CHILLERS, AIR-COOLED (PREPURCHASED BY OWNER)																				MASTER LAST UPDATED 2/3/11														
TAG	SERVICE	LOCATION	CAPACITY (TONS)	REFRIGERANT		EVAPORATOR					CONDENSER					COMPRESSOR AND ELECTRICAL DATA(1)					MINIMUM CHILLER EFFICIENCY(2)		MAXIMUM DIMENSIONS W x L x H (IN x IN x IN)	SHIPPING WEIGHT (LBS)	OPERATING WEIGHT (LBS)	MANUFACTURER	MODEL NUMBER	REMARKS						
				TYPE	CHARGE (LBS)	FLUID TYPE	FLOW RATE (GPM)	ENT FLUID TEMP (°F)	LVS FLUID TEMP (°F)	MAXIMUM PRESSURE DROP (FT WG)	FOULING FACTOR	MAXIMUM AMBIENT AIR TEMP (°F)	MINIMUM AMBIENT AIR TEMP (°F)	NUMBER OF FANS	FAN SPEED (RPM)	FAN POWER (HP)	COMPRESSORS	TOTAL INPUT POWER (kW)	MINIMUM CIRCUIT CURRENT (AMPS) CIRCUIT 1	MAXIMUM OVERCURRENT PROTECTION (AMPS) CIRCUIT 1	MINIMUM CIRCUIT CURRENT (AMPS) CIRCUIT 2	MAXIMUM OVERCURRENT PROTECTION (AMPS) CIRCUIT 2							V/Ø/Hz	CHILLER MOUNTED VFD (YES OR NO)	EMERGENCY POWER SOURCE REQUIRED (YES OR NO)	EER	NPLV EER	
ACC-E2	JAIL BLDG	ROOF	290	R-134A	370	WATER	720	54	44	19	0.0001	125	32	14	1160	-	2	SCREW	333.8	302.4	500	294.7	500	460/3/60	YES	NO	9.7	16.1	88 x 346 x 99	17,135	17,553	CARRIER	30XV300	SEE EXHIBIT FOR OPTIONS

NOTES:
(1) UNIT PROVIDED WITH FIELD INSTALLED ACCESSORIES: DISPLAY HEATER, HAIL GUARDS, AND SPRING ISOLATORS.

CWP PUMPS - EXISTING															MASTER LAST UPDATED 2/3/11									
TAG	SERVICE (CHILLED WATER, HOT WATER, ETC)	LOCATION	TYPE (END-SUCTION, IN-LINE, ETC)	DESIGN POINT(1)		FLUID TYPE	FLUID TEMP (°F)	MINIMUM PUMP EFFICIENCY (%)	MAXIMUM WORKING PRESSURE (PSIG)	MOTOR				EMERGENCY POWER SOURCE REQUIRED (YES OR NO)	CONNECTED TO VFD (YES OR NO)	OPERATING WEIGHT (LBS)	MANUFACTURER	MODEL NUMBER	REMARKS					
				FLOW RATE (GPM)	PUMP HEAD (FT WG)					ABSORBED POWER (BHP)	RATED POWER (HP)	SPEED (RPM)	V/Ø/HZ											
CWP-5	CHILLED WATER	PUMP ROOM	END SUCTION	720	120	WATER	44	80	175	27.5	30	1770	460/3/60	NO	YES	810	BELL & GOSSETT	E-1510 4GC						
CWP-5A	CHILLED WATER	PUMP ROOM	END SUCTION	720	120	WATER	44	80	175	27.5	30	1770	460/3/60	NO	YES	810	BELL & GOSSETT	E-1510 4GC						

NOTES:
(1) WHERE THE SCHEDULED DESIGN POINT INTERSECTS THE PUMP CURVE IS IMPORTANT. ALTERNATE PUMP MANUFACTURERS ARE DEFINED IN THE SPECIFICATION. HOWEVER, THOSE ALTERNATE PUMP MANUFACTURERS WILL ONLY BE ACCEPTED IF THEY CAN BE SHOWN TO OPERATE AT THE SCHEDULED DESIGN POINT AND AT A SIMILAR POINT ON THEIR PUMP CURVES.

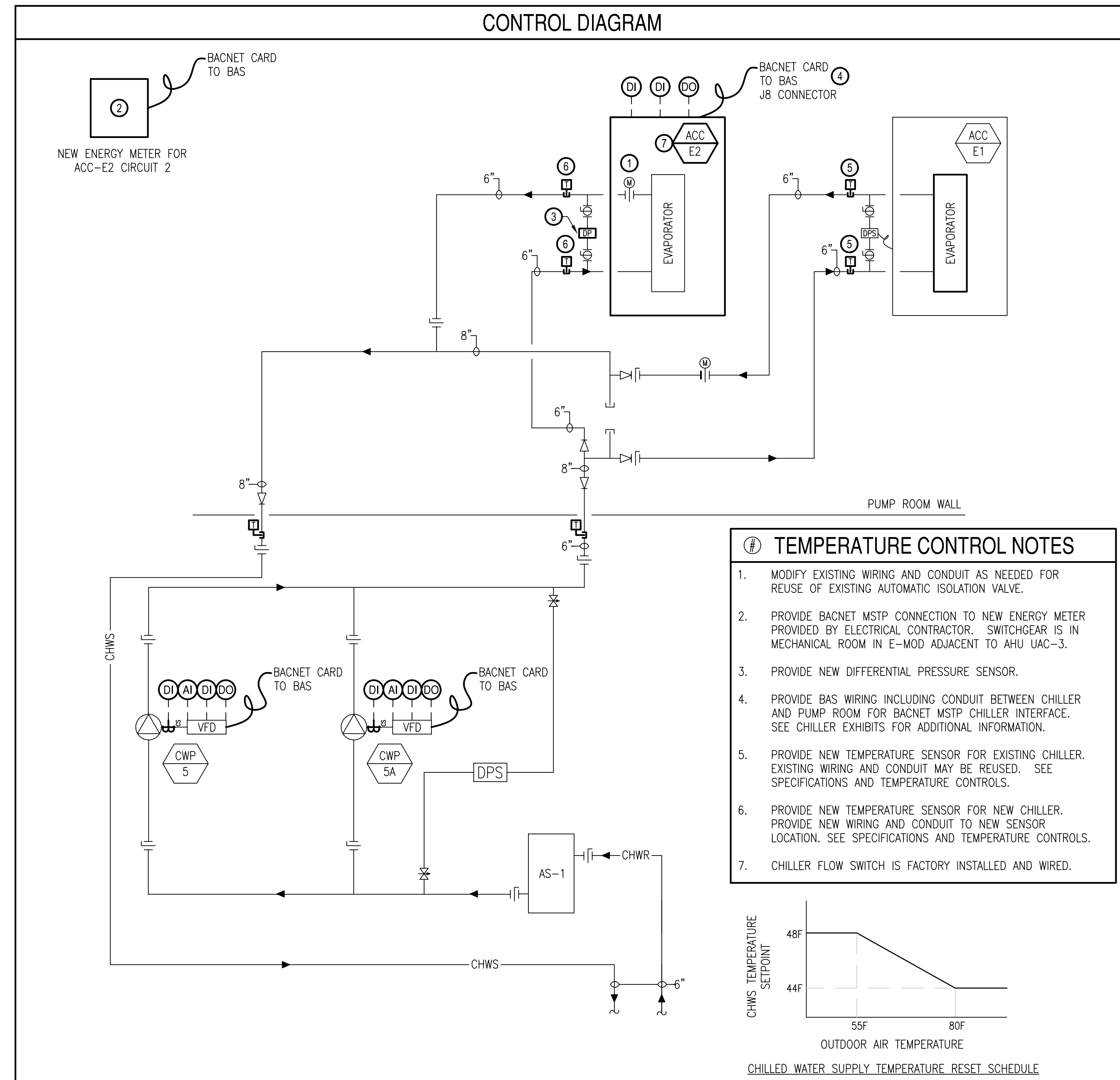
CONTROL SEQUENCE

TEMPERATURE CONTROL NOTES

- ALL CONTROL WIRING SHALL BE IN CONDUIT, CONFORMING TO NATIONAL ELECTRICAL CODE AND ELECTRICAL SPECIFICATIONS. OUTDOOR WIRING SHALL BE IN WEATHER-PROOF RACEWAY WITH LIQUID TIGHT CONNECTIONS.
- CONTROLS SHALL BE FROM THE EXISTING ALPHA CONTROLS CONTROL SYSTEM. MODIFY EXISTING CONTROLS AS REQUIRED.
- PROVIDE DEMOLITION OF ALL CONTROL DEVICES AND WIRING MADE OBSOLETE BY NEW WORK.
- ALL SETPOINTS SHALL BE ADJUSTABLE. ADJUSTABLE SETPOINTS SHALL BE AVAILABLE ON SCREEN UNLESS NOTED AS NOT ADJUSTABLE.
- NEW TEMPERATURE SENSORS SHALL BE 1000-OHM PLATINUM RTD'S.
- PROVIDE NEW/UPDATED SYSTEM GRAPHIC AT OPERATOR WORKSTATION TO REFLECT THE WORK OF THIS PROJECT.
- BACNET INTERFACE CARDS SHALL BE PROVIDED WITH EQUIPMENT. COORDINATE WITH MECHANICAL. UTILIZE SHIELDED CABLE AS DIRECTED BY MANUFACTURER.
- ANNUNCIATE ALL ALARMS AT THE BUILDING AUTOMATION SYSTEM FRONT END.
- ON FAILURE OF ANY LEAD-LAG DEVICE, ALARM AND NEXT SYSTEM IN SEQUENCE SHALL BE STARTED.
- COORDINATE WITH ELECTRICAL REGARDING PROVISION OF POWER AND VOLTAGES TO CONTROL DEVICES AND PANELS.
- FOR ALL MODES OF OPERATION, PROVIDE MAINTENANCE MODE THAT REMOVES CHILLER, PUMP, ETC. FROM OPERATING ROTATION WITHOUT ABRIDGING AUTOMATIC MODE(S) OF OPERATION.

CHILLER CONTROL SEQUENCE (EXISTING)

- CHILLER PLANT SHALL BE ENABLED BASED ON ONE OF THE FOLLOWING:
 - ENABLED BY OPERATOR.
 - ENABLED BASED ON OUTSIDE AIR TEMPERATURE OF 55F (ADJ.)
 - OTHER EXISTING MODE.
- ONLY ONE CHILLER SHALL OPERATE AT ANY TIME. IF ONE CHILLER FAILS, THE OTHER CHILLER SHALL START.
- ON CALL FOR COOLING:
 - YORK CHILLER ISOLATION VALVE SHALL OPEN AND PROVE OPEN VIA END SWITCH FOR CHILLER WITH LEAST AMOUNT OF RUN HOURS.
 - CHILLED WATER PUMP WITH LEAST AMOUNT OF RUN HOURS SHALL START. ROTATE PUMPS WEEKLY.
 - CHILLED WATER PUMP VFD SHALL MODULATE TO SPEED EQUAL TO 380 GPM AS DETERMINED BY TEST AND BALANCE CONTRACTOR IN COORDINATION WITH CONTROLS CONTRACTOR.
 - YORK CHILLER SHALL START AFTER FLOW IS PROVEN THROUGH MANUFACTURER SUPPLIED AND CONTRACTOR INSTALLED DIFFERENTIAL PRESSURE FLOW SWITCH.
 - INTERNAL CHILLER CONTROLS SHALL STAGE COMPRESSORS AS NEEDED TO MAINTAIN CHILLED WATER TEMPERATURE SETPOINT.
- CARRIER CHILLER STAGE ON
 - CARRIER CHILLER SHALL STAGE ON BASED ON ONE OF THE FOLLOWING:
 - ENABLED BY OPERATOR.
 - LEAD CHILLER AMPERAGE IS 90% OF FULL LOAD FOR MORE THAN 15 MIN (ADJ.)
 - OTHER EXISTING MODE.
 - YORK CHILLER SHALL BE DISABLED. YORK CHILLER ISOLATION VALVE SHALL CLOSE ONCE CARRIER CHILLER ISOLATION VALVE HAS OPENED AND PROVEN VIA END SWITCH.
 - CHILLED WATER PUMP SHALL SLOWLY INCREASE SPEED TO EQUAL 720 GPM AS DETERMINED BY TEST AND BALANCE CONTRACTOR IN COORDINATION WITH CONTROLS CONTRACTOR.
 - CHILLER SHALL START AFTER FLOW IS PROVEN THROUGH INTERNAL FACTORY WIRED FLOW SWITCH AND YORK CHILLER ISOLATION VALVE IS CLOSED.
 - INTERNAL CHILLER CONTROLS SHALL STAGE COMPRESSORS AS NEEDED TO MAINTAIN CHILLED WATER TEMPERATURE SETPOINT.
- CARRIER CHILLER STAGE OFF
 - LAG CHILLER SHALL STAGE OFF BASED ON ONE OF THE FOLLOWING:
 - DISABLED BY OPERATOR.
 - CARRIER CHILLER AMPS IS 45% OF FULL LOAD FOR MORE THAN 15 MIN (ADJ.)
 - OTHER EXISTING MODE.
 - CHILLER SHALL BE DISABLED.
 - PUMP SHALL REDUCE SPEED FOR OPERATION WITH YORK CHILLER.
 - CARRIER ISOLATION VALVE SHALL CLOSE.
 - YORK ISOLATION VALVE SHALL OPEN.
 - YORK CHILLER SHALL START UPON PROOF OF FLOW.
- CHILLER PLANT SHALL BE DISABLED BASED ON ONE OF THE FOLLOWING:
 - DISABLED BY OPERATOR.
 - IF OUTSIDE AIR TEMPERATURE DROPS BELOW 50F (ADJ.) FOR MORE THAN 30 MIN (ADJ.)
 - OTHER EXISTING MODE.
 - WHEN BOTH CHILLERS ARE OFF, OWNER SHALL HAVE OPTION OF CIRCULATING CHILLED WATER THROUGH THE SYSTEM. BOTH AUTOMATIC ISOLATION VALVES SHALL BE OPEN AND PUMP SHALL START AT LOW SPEED.
- CHILLED WATER TEMPERATURE RESET
 - EVERY 15 MIN (ADJ.), RESET THE CHILLED WATER TEMPERATURE SETPOINT BASED ON CHILLED WATER TEMPERATURE RESET SCHEDULE.



VFD VARIABLE FREQUENCY DRIVES - EXISTING

TAG	EQUIPMENT SERVED	LOCATION	MOTOR		VFD RATING		WITH BYPASS (YES OR NO)	MANUFACTURER	MODEL NUMBER	REMARKS	
			RATED POWER (HP)	V/Ø/Hz	RATED POWER (HP)	AMPS					
VFD-CWP5	CWP-5	PUMP ROOM	30	460/3/60	30	40	460/3/60	YES	SCHNEIDER ELECT	S-FLEX SFD212M4Y	EXISTING
VFD-CWP5A	CWP-5A	PUMP ROOM	30	460/3/60	30	40	460/3/60	YES	SCHNEIDER ELECT	S-FLEX SFD212M4Y	EXISTING

NOTES:

POINTS LIST

DESCRIPTION	POINT TYPE				REMARKS
	DI DIGITAL INPUT	DO DIGITAL OUTPUT	AI ANALOG INPUT	AO ANALOG OUTPUT	
ACC-E1 GENERAL ALARM SYSTEM 1	X				EXISTING POINT
ACC-E1 GENERAL ALARM SYSTEM 2	X				EXISTING POINT
ACC-E1 REMOTE START/STOP		X			EXISTING POINT
ACC-E2 GENERAL ALARM	X				HARDWIRED TO CONTROLLER
ACC-E2 REMOTE RUN STATUS	X				HARDWIRED TO CONTROLLER
ACC-E2 REMOTE START/STOP		X			HARDWIRED TO CONTROLLER
ACC-E1 AUTOMATIC ISOLATION VALVE COMMAND				X	EXISTING POINT
ACC-E2 AUTOMATIC ISOLATION VALVE COMMAND				X	EXISTING POINT - MODIFY WIRING/CONDUIT TO NEW LOCATION
ACC-E1 AUTOMATIC ISOLATION VALVE END SWITCH	X				EXISTING POINT
ACC-E2 AUTOMATIC ISOLATION VALVE END SWITCH	X				EXISTING POINT - MODIFY WIRING/CONDUIT TO NEW LOCATION
ACC-E1 CHILLER AMPS			X		EXISTING POINT
ACC-E1 CHWS TEMPERATURE			X		PROVIDE NEW SENSOR - WIRING CAN BE REUSED
ACC-E1 CHWR TEMPERATURE			X		PROVIDE NEW SENSOR - WIRING CAN BE REUSED
ACC-E2 CHWS TEMPERATURE			X		PROVIDE NEW SENSOR - WIRE TO NEW LOCATION
ACC-E2 CHWR TEMPERATURE			X		PROVIDE NEW SENSOR - WIRE TO NEW LOCATION
MAIN CHWS TEMPERATURE			X		EXISTING POINT
MAIN CHWR TEMPERATURE			X		EXISTING POINT
DIFFERENTIAL PRESSURE			X		PROVIDE NEW SENSOR
ACC-E1 CHWS TEMPERATURE			X		EXISTING POINT
ACC-E1 CHWR TEMPERATURE			X		EXISTING POINT
ACC-E1 CHILLED WATER REMOTE SETPOINT			X	X	EXISTING POINT
ACC-E1 CHILLED WATER SETPOINT			X		EXISTING POINT
ACC-E1 SYSTEM 1 OPERATIONAL CODE			X		EXISTING POINT
ACC-E1 SYSTEM 1 FAULT CODE			X		EXISTING POINT
ACC-E1 SYSTEM 2 OPERATIONAL CODE			X		EXISTING POINT
ACC-E1 SYSTEM 2 FAULT CODE			X		EXISTING POINT
ACC-E1 UNIT CONTROL MODE		X			EXISTING POINT
ACC-E1 SYSTEM 1 ALARM		X			EXISTING POINT
ACC-E1 SYSTEM 2 ALARM		X			EXISTING POINT
ACC-E1 EVAPORATOR HEATER STATUS		X			EXISTING POINT
ACC-E2 CHWS TEMPERATURE		X	X		VA BACNET MS/TP
ACC-E2 CHWR TEMPERATURE		X	X		VA BACNET MS/TP
ACC-E2 CHILLED WATER SETPOINT SELECT				X	VA BACNET MS/TP
ACC-E2 CHILLED WATER CURRENT SETPOINT				X	VA BACNET MS/TP
ACC-E2 CHILLED WATER CONTROL SETPOINT				X	VA BACNET MS/TP
ACC-E2 SYSTEM 1 OPERATIONAL CODE			X		VA BACNET MS/TP
ACC-E2 SYSTEM 1 FAULT CODE			X		VA BACNET MS/TP
ACC-E2 SYSTEM 2 OPERATIONAL CODE			X		VA BACNET MS/TP
ACC-E2 SYSTEM 2 FAULT CODE			X		VA BACNET MS/TP
ACC-E2 UNIT CONTROL TYPE (POINT01)		X			VA BACNET MS/TP
ACC-E2 SYSTEM 1 ALARM		X			VA BACNET MS/TP
ACC-E2 SYSTEM 2 ALARM		X			VA BACNET MS/TP
ACC-E2 EVAPORATOR HEATER STATUS (POINT80)		X			VA BACNET MS/TP
CWP-5 VFD START/STOP		X			EXISTING POINT
CWP-5 GENERAL ALARM	X				EXISTING POINT
CWP-5 STATUS	X				EXISTING POINT
CWP-5 KW			X		EXISTING POINT
CWP-5 SPEED			X		EXISTING POINT
CWP-5A VFD START/STOP		X			EXISTING POINT
CWP-5A STATUS	X				EXISTING POINT
CWP-5A GENERAL ALARM	X				EXISTING POINT
CWP-5A KW			X		EXISTING POINT
CWP-5A SPEED			X		EXISTING POINT

NOTES:
(1) ALL NEW POINTS SHALL BE ADDED TO THE GRAPHICS. MATCH ACC-E1 GRAPHICS.



Grumman/Burkus Associates
Energy Efficiency Consultants and Sustainable Design Engineers
820 Davis St., Ste 300
Evanston, Illinois 60201 4446
847 328-3555 www.grummanburkus.com
Copyright © 2010 Grumman/Burkus Associates. Illinois Registration # 184-00066

NO.	DATE	DESCRIPTION	ISSUED FOR PERMIT
	11/02/23	ISSUED FOR BID	
		ISSUED FOR PERMIT	

MECHANICAL SCHEDULES AND TEMPERATURE CONTROLS

JAIL CHILLER REPLACEMENT
McHENRY COUNTY GOVERNMENT CENTER
2200 NORTH SEMINARY AVENUE
WOODSTOCK, IL 60098

DATE	SCALE	NO. SCALE	NO. SCALE
10/27/23			
DESIGNED	CHECKED	APPROVED	DATE
			11/02/23

M3.0

ELECTRICAL SHEET SPECIFICATION
BASIC ELECTRICAL MATERIALS AND METHODS

- 1.0 GENERAL
- 1.1 SCOPE: THE WORK SPECIFIED IN THESE NOTES INCLUDES, BUT SHALL NOT BE LIMITED TO: PROVIDING LABOR, MATERIAL, EQUIPMENT, AND SERVICES NECESSARY FOR ELECTRICAL WORK AS SHOWN ON THE DRAWINGS AND AS HEREIN SPECIFIED.
- 1.2 REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION AND COORDINATION.
- 1.3 THE CONTRACTOR SHALL BE RESPONSIBLE FOR SHOP DRAWING SUBMITTALS WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO A MINIMUM OF FIVE (5) COPIES OF: PRODUCT DATA AND EQUIPMENT SPECIFICATIONS SHEETS, SCHEMATIC DIAGRAMS, WIRING DIAGRAMS, SIZES, MOUNTING DETAILS WITH REQUIRED ELEVATIONS, TECHNICAL DESCRIPTIONS OF COMPONENTS, TEST REPORTS, CERTIFICATES, OPERATING AND MAINTENANCE MANUALS, AND PROPER CALCULATIONS TO ENSURE SPECIFIED PERFORMANCE OF THE SYSTEMS. NO EQUIPMENT SHALL BE ORDERED, PURCHASED, OR INSTALLED WITHOUT PRIOR APPROVAL BY THE ENGINEER OF THE SUBMITTALS AND SHOP DRAWINGS.
- 1.4 ALL WORK SHALL COMPLY WITH THE ELECTRICAL CODE APPROVED BY THE LOCAL AUTHORITY, AND ALL OTHER APPLICABLE FEDERAL, STATE AND LOCAL CODES. WHERE THE CONSTRUCTION DOCUMENTS INDICATE MORE RESTRICTIVE REQUIREMENTS, THE CONSTRUCTION DOCUMENTS SHALL GOVERN BUT THE CONSTRUCTION DOCUMENTS SHALL NOT BE INTERPRETED AS AUTHORITY TO VIOLATE ANY CODE OR REGULATION.
- 1.5 NOT ALL EXISTING ELECTRICAL EQUIPMENT IS SHOWN ON THE PLANS. A SURVEY OF THE JOB SITE MUST BE MADE TO DETERMINE THE EXTENT OF EXISTING ELECTRICAL EQUIPMENT.
- 1.6 IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN ITEMS INDICATED ON THE PLANS AND/OR SPECIFICATION NOTES OR WITH CODE REQUIREMENTS, THE NOTE, SPECIFICATION OR CODE WHICH PREScribes AND ESTABLISHES THE MORE COMPLETE JOB OR THE HIGHER STANDARD SHALL PREVAIL.
- 1.7 OMISSIONS FROM THE DRAWINGS, SPECIFICATION NOTES, OR THE DETAILS OF WORK WHICH ARE NECESSARY TO CARRY OUT THE INTENT OF THE DRAWINGS AND SPECIFICATIONS, OR WHICH ARE CUSTOMARILY PERFORMED, SHALL NOT RELIEVE THE CONTRACTOR FROM PERFORMING SUCH OMITTED DETAILS OF THE WORK BUT THEY SHALL BE PERFORMED AS IF FULLY AND CORRECTLY SET FORTH AND DESCRIBED IN THE DRAWINGS AND SPECIFICATIONS.
- 1.8 THE CONTRACTOR SHALL CHECK ALL DRAWINGS FURNISHED HIM IMMEDIATELY UPON THEIR RECEIPT AND SHALL PROMPTLY NOTIFY THE OWNER OF ANY DISCREPANCIES. FIGURES MARKED ON DRAWINGS SHALL IN GENERAL BE FOLLOWED IN PREFERENCE TO SCALE MEASUREMENTS. LARGE SCALE DRAWINGS SHALL IN GENERAL GOVERN SMALL SCALE DRAWINGS. THE CONTRACTOR SHALL COMPARE ALL DRAWINGS AND VERIFY THE FIGURES BEFORE LAYING OUT THE WORK AND WILL BE RESPONSIBLE FOR ANY ERRORS WHICH MIGHT HAVE BEEN AVOIDED THEREBY.
- 2.0 PRODUCTS AND MATERIALS
- 2.1 RACEWAYS
- A. CONDUIT AND FITTINGS INSTALLED FOR MOTOR CIRCUITS, FEEDER CIRCUITS, EXPOSED TO WEATHER, OR EXPOSED WHERE SUBJECT TO MECHANICAL INJURY SHALL BE RIGID STEEL (RGS) OR INTERMEDIATE METAL CONDUIT (IMC) COMPLYING ANSI C80.1. FITTINGS SHALL BE THREADED.
- B. CONDUIT AND FITTINGS INSTALLED FOR BRANCH CIRCUITS, FIRE ALARM, PAGING, SIGNAL, AND LOW VOLTAGE CIRCUITS SHALL BE ELECTRICAL METAL TUBING (EMT) COMPLYING WITH NEMA FB C80.3. EMT FITTINGS SHALL BE THE DIE CAST COMPRESSION TYPE. SET SCREW FITTINGS ARE NOT PERMITTED.
- C. FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT SHALL BE MADE WITH LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC).
- D. MINIMUM SIZE CONDUIT SHALL BE 3/4" INCH (19 MM).
- E. RACEWAYS SHALL BE SECURELY SUPPORTED BY APPROVED METHODS AT FIVE FOOT (5') INTERVALS.
- F. PULL BOXES ARE REQUIRED IN RUNS OVER 100 FEET, WHEN MORE THAN THE EQUIVALENT OF THREE (3) 90° BENDS ARE USED, AND AS SHOWN ON DRAWINGS.
- 2.2 BOXES
- A. PULL AND JUNCTION BOXES AND COVERS SHALL BE FABRICATED FROM GALVANIZED NEC GAGE SHEET STEEL. OUTLET BOXES TO BE OF THE HOT-DIPPED GALVANIZED, PRESSED STEEL, KNOCKOUT TYPE. BOXES SHALL GENERALLY BE 4" INCHES SQUARE EXCEPT WHERE NOTED OTHERWISE.

- 2.3 WIRE AND CABLE
- A. UNLESS NOTED OTHERWISE, CONDUCTORS FOR POWER AND LIGHTING SHALL BE COPPER, #12 AWG MINIMUM WITH 600 VOLT INSULATION, TYPE THHN, 90 DEGREE C, CONFORMING TO THE LATEST NEC AND SHALL BEAR UL LABEL.
- B. BRANCH CIRCUIT WIRING SHALL BE SOLID COPPER WHEN #10 AWG OR SMALLER, UNLESS OTHERWISE SPECIFIED. WIRE #8 AWG AND LARGER SHALL BE STRANDED COPPER.
- C. WIRE FOR SIGNAL AND CONTROL SYSTEMS SHALL BE #14 AWG, UNLESS OTHERWISE NOTED.
- 2.4 ELECTRICAL CONNECTIONS
- A. ALL WIRE CONNECTIONS SHALL BE MADE BY MEANS OF SOLDERLESS CONNECTORS.
- B. BRANCH CIRCUIT JOINTS OF SPLICES FOR WIRES #10 AND SMALLER SHALL BE MADE WITH 3M BRAND SCOTCHLOK ELECTRICAL SPRING CONNECTORS.
- C. SPLICES AND JOINTS FOR CONDUCTORS NO. 8 AND LARGER SHALL BE BY MEANS OF HIGH PRESS, LONG BARREL, CAST COPPER, COMPRESSION CONNECTORS.
- D. JOINT AND SPLICES SHALL BE COVERED WITH 3M ELECTRICAL TAPE TO 150% OF INSULATION VALUE.
- E. NO SPLICES SHALL BE MADE IN THE CONDUCTOR EXCEPT AT OUTLET BOXES, JUNCTION BOXES, OR IN SPLICE BOXES.
- 2.5 PANELBOARDS
- A. EXISTING PANEL BOARDS TO BE REUSED SHALL BE PROVIDED WITH UPDATED TYPE WRITTEN DIRECTORIES AFTER NEW WORK IS COMPLETED. CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS TO MATCH EXISTING PANEL BOARDS AS INDICATED ON DRAWINGS.
- 2.6 DISCONNECT SWITCHES
- A. PROVIDE HEAVY DUTY SURFACE-MOUNTED SAFETY SWITCHES FOR MOTORS UNLESS OTHERWISE INDICATED, OF TYPES, SIZES, AND ELECTRICAL CHARACTERISTICS AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS. THE SWITCHES SHALL BE FUSED OR NON-FUSED AS INDICATED ON THE DRAWINGS OR AS REQUIRED AND SHALL BE MANUFACTURED BY SQUARE D, CUTLER HAMMER, OR GENERAL ELECTRIC.
- B. SWITCHES SHALL HAVE SWITCH BLADES WHICH SHALL BE FULLY VISIBLE IN THE OFF POSITION WHEN THE ENCLOSURE DOOR IS OPEN. CURRENT CARRYING PARTS SHALL BE PLATED COPPER AND SWITCH CONTACTS SHALL BE SILVER-TUNGSTEN. SWITCHES SHALL BE QUICK-MADE, QUICK-BREAK TYPE. THE OPERATING HANDLE SHALL BE AN INTEGRAL PART OF THE ENCLOSURE BASE AND SHALL BE PADLOCKABLE IN THE OFF POSITION. THE HANDLE POSITION SHALL INDICATE WHETHER THE SWITCH IS ON OR OFF. SWITCHES SHALL BE HORSE POWER RATED FOR 250 AC OR DC OR 600 VOLTS AC AS REQUIRED.
- C. CONTACTS: PROVIDE TWO FORM C AUXILIARY, 10 AMPERE, 300 VOLT RATED CONTACTS. THE CONTACTS SHALL PROVIDE TWO NORMALLY OPEN AND TWO NORMALLY CLOSED CONTACTS FOR SWITCH OPEN OR CLOSED POSITION.
- 2.7 GROUNDING
- A. THE COMPLETE ELECTRICAL INSTALLATION SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDING IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODE. EQUIPMENT GROUNDING SYSTEM CABLE SHALL BE COPPER.
- B. EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSTALLED IN ALL RACEWAYS AND ENCLOSURES WITHIN THE BUILDING.
- C. ACCESSIBLE GROUNDING CONNECTIONS SHALL BE BOLTED OR CLAMP TYPE UNLESS OTHERWISE INDICATED. SOLDERED CONNECTIONS WILL NOT BE PERMITTED IN THE GROUNDING SYSTEM.
- D. WHERE CONDUITS TERMINATE AT EQUIPMENT, OR IN THE PULL BOXES OF EQUIPMENT, FOR WHICH A GROUND BUS IS SPECIFIED, PROVIDE THEM WITH BUSBARS OF THE GROUNDING TYPE HAVING THE MAXIMUM AVAILABLE ACCOMMODATION FOR GROUND WIRES. GROUND EACH BUSHING INDIVIDUALLY TO THE EQUIPMENT GROUND BUS WITH THE CODE REQUIRED SIZE COPPER WIRE.

- 3.0 EXECUTION
- 3.1 AS A MINIMUM, ELECTRICAL WORK SHALL COMPLY WITH NECA STANDARDS AND RECOMMENDED PRACTICES FOR ELECTRICAL INSTALLATION AS APPLICABLE TO THIS PROJECT. NECA PHONE 201-215-4504.
- 3.2 THE CONTRACTOR SHALL MAKE POWER CONNECTIONS TO ALL MOTORS AND EQUIPMENT FURNISHED BY OTHERS. SEE MECHANICAL DRAWINGS, SPECIFICATIONS AND NOTES FOR ADDITIONAL INFORMATION.
- 3.3 ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECT.
- 3.4 ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BEAR THE UNDERWRITERS' LABEL (UL) AND SHALL BE INSTALLED IN THE MANNER FOR WHICH THEY ARE DESIGNED AND APPROVED.
- 3.5 ALL DEVICES INSTALLED OUTSIDE OR IN DAMP LOCATIONS SHALL BE APPROVED WEATHERPROOF.
- 3.6 THE CONTRACTOR SHALL INSTALL ALL CONDUITS AND WIRES WITH A MINIMUM NUMBER OF BENDS AND IN SUCH A MANNER AS TO CONFORM TO THE STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEAD ROOM, KEEP OPENINGS AND PASSAGEWAYS CLEAR AND MEET ALL STRUCTURAL CODE REQUIREMENTS.
- 3.7 THE CONTRACTOR SHALL NOT BORE, NOTCH OR IN ANY WAY CUT INTO ANY STRUCTURAL MEMBER WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT OR STRUCTURAL ENGINEER.
- 3.8 THE CONTRACTOR SHALL PROVIDE SUPPORT FOR ALL FIXTURES AND ELECTRICAL EQUIPMENT TO COMPLY WITH THE SEISMIC REQUIREMENTS OF THE UNIFORM BUILDING CODE AND ALL LOCAL ORDINANCES.
- 3.9 ALL CONDUIT CONNECTIONS TO MOTORS, AND EQUIPMENT SUBJECT TO VIBRATION (INCLUDING TRANSFORMERS) SHALL BE MADE WITH LIQUIDTIGHT FLEX CONDUIT. FLEXIBLE CONNECTION SHALL BE BETWEEN 18 AND 36 INCHES IN LENGTH. ARRANGE CONNECTIONS TO PREVENT THE ENTRANCE OF MOISTURE. PROVIDE CONTINUOUS EQUIPMENT GROUND WIRE THROUGH ALL FLEXIBLE CONDUITS TO ASSURE GROUND CONTINUITY.
- 3.10 THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDING AS REQUIRED BY ALL APPLICABLE CODES.
- 3.11 THE ENTIRE WIRING SYSTEM SHALL BE TESTED FOR SHORT CIRCUITS, GROUNDS AND INSULATION RESISTANCE BETWEEN CONDUCTORS AND TO GROUND.
- 3.12 THE CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUITS, WIRES, AND BOXES REQUIRED FOR A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM.
- 3.13 PROVIDE AN EXTERNAL MANUAL DISCONNECTING MEANS AT ALL MOTORS OR PACKAGED MECHANICAL EQUIPMENT UNLESS NOTED OTHERWISE.
- 3.14 PROVIDE AN ENCLOSURE OF EQUAL FIRE RESISTANT RATING AROUND ALL FIXTURES AND EQUIPMENT INSTALLED IN OR PENETRATING THROUGH FIRE RATED SEPARATIONS. THROUGH STOP FIRE SEALING OF CONDUITS SHALL BE MADE WITH 3M CPSPWP-CAULK ACCORDING TO UL APPLICATION.
- 3.15 LOCATIONS SHOWN ON THE MECHANICAL DRAWINGS TAKE PRECEDENCE OVER THOSE SHOWN ON THE ELECTRICAL DRAWINGS. REFER TO THE MECHANICAL FOR THE EXACT LOCATIONS, RATINGS, TYPE CONNECTIONS, WIRING DIAGRAMS AND AUXILIARY DEVICES.
- 3.16 THE CONTRACTOR SHALL RECEIVE, STORE AND INSTALL ALL ELECTRICAL ITEMS FURNISHED BY THE OWNER.
- 3.17 PROVIDE TYPEWRITTEN DIRECTORY CARD IN ALL NEW AND MODIFIED PANELS. IDENTIFY LOAD SERVED BY EACH CIRCUIT BREAKER.
- 3.18 PROVIDE ENGRAVED NAMEPLATES ON ALL MOTOR CONTROL CENTERS, VFD(S) AND DISCONNECT SWITCHES.
- 3.19 THE CONTRACTOR SHALL PROVIDE A SET OF AS-BUILT DRAWINGS SHOWING THE LOCATIONS OF ALL CONDUITS, INDICATE ALL CHANGES MADE DURING CONSTRUCTION, AND ANY DEVIATIONS FROM THE ELECTRICAL DRAWINGS.
- 3.20 PROVIDE PULL WIRE IN ALL EMPTY CONDUITS.
- 3.21 FOR PURPOSES OF CLEARANCE AND LEGIBILITY, THE ELECTRICAL DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC. THE SIZE AND LOCATION OF EQUIPMENT IS SHOWN TO SCALE WHEREVER POSSIBLE. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND INFORMATION AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATION SECTIONS WHERE ELECTRICAL WORK INTERFACES WITH OTHER TRADES.
- 3.22 DISCONNECT AND REMOVE ALL EXISTING INTERIOR AND EXTERIOR ELECTRICAL DEVICES, EQUIPMENT, WIRING, EXPOSED ABANDONED CONDUIT, ETC., NO LONGER REQUIRED UNLESS OTHERWISE NOTED.
- 3.23 THIS CONTRACTOR SHALL VISIT THE EXISTING BUILDINGS AND GROUNDS AND FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS. NO ALLOWANCE WILL BE MADE SUBSEQUENTLY, ON THIS CONDITION, IN BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLIGENCE ON HIS PART.
- 3.24 WHERE EXISTING EQUIPMENT OR CONDUIT IS REMOVED OR CHANGED, ALL CONDUIT AND WIRE NO LONGER IN SERVICE SHALL BE REMOVED. ALL BUILDING SURFACES DAMAGED AND OPERINGS LEFT BY THE REMOVAL OR RELOCATION OF EQUIPMENT, CONDUIT, ETC., SHALL BE REPAIRED BY THIS CONTRACTOR.
- 3.25 EXISTING CONDUIT AND WIRE SHALL NOT BE REUSED UNLESS NOTED OTHERWISE.

GENERAL NOTES FOR DEMOLITION

1. EXAMINATION
- A. THE CONTRACTOR SHALL VISIT THE SITE AND EXAMINE AREAS UNDER WHICH THE WORK IS TO BE PERFORMED AND NOTIFY THE OWNER IN WRITING OF ANY CONDITIONS DETERMINED TO BE IMPROPER AND TIMELY COMPLETION OF THE WORK. CONTRACTOR SHALL NOT PROCEED WITH WORK UNTIL SATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
- B. VERIFY FIELD MEASUREMENTS AND CIRCUITING ARRANGEMENTS FOR DEVICES SHOWN ON DRAWINGS.
- C. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION AND EXISTING RECORD DRAWINGS. REPORT DISCREPANCIES TO OWNER BEFORE DISTURBING EXISTING INSTALLATION.
- D. COMMENCEMENT OF DEMOLITION MEANS ACCEPTANCE OF EXISTING CONDITIONS.
2. PREPARATION
- A. DISCONNECT ELECTRICAL SYSTEMS IN WALLS, FLOORS, AND CEILING SCHEDULED FOR REMOVAL.
- B. COORDINATE UTILITY SERVICE SHUT-DOWN WITH THE UTILITY COMPANY.
- C. NOTIFY THE OWNER AT LEAST 48 HOURS BEFORE PARTIALLY, OR COMPLETELY DISABLING ANY ELECTRICAL SYSTEM.
- D. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. EXPERIENCED PERSONNEL SHALL BE USED WHEN WORKING ON ENERGIZED EQUIPMENT OR CIRCUITS.
- E. EXISTING ELECTRICAL SERVICE: MAINTAIN EXISTING ELECTRICAL SYSTEM IN SERVICE UNTIL NEW SERVICE IS COMPLETE AND READY FOR SERVICE. DISABLE ELECTRICAL SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. MINIMIZE OUTAGE DURATION. MAKE TEMPORARY CONNECTIONS TO MAINTAIN ELECTRICAL SERVICE IN AREAS ADJACENT TO WORK AREA.
- F. MAINTAIN EXISTING FIRE ALARM SYSTEM IN SERVICE UNTIL NEW SYSTEM IS EXISTING. DISABLE SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. WHERE FIRE ALARM DEVICES MUST BE REMOVED TO ACCOMMODATE THE REMOVAL OF WALLS, NOTIFY THE OWNER AND ENGINEER IN WRITING WITH LOCATIONS OF DEVICES.
3. DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK
- A. REMOVE, RELOCATE, AND EXTEND EXISTING ELECTRICAL WORK AS INDICATED ON THE DRAWINGS AND AS NOTED HEREIN.
- B. REMOVE ABANDONED WIRING BACK TO SOURCE OF SUPPLY.
- C. WHERE SOURCE OF SUPPLY IS A PANELBOARD, RE-LABEL PROTECTIVE DEVICES AS "SPARE". AFTER DEMOLITION IS COMPLETE, SUBMIT REVISED PANELBOARD SCHEDULES INDICATING "SPARES" TO OWNER AND ENGINEER.
- D. REMOVE EXPOSED ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES.
- E. DISCONNECT AND REMOVE ABANDONED OUTLETS AND ASSOCIATED DEVICES.
- F. DISCONNECT AND REMOVE ABANDONED PANELBOARDS AND DISTRIBUTION EQUIPMENT.
- G. DISCONNECT AND REMOVE ELECTRICAL DEVICES AND EQUIPMENT THAT IS NO LONGER IN USE.
- H. DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND ALL OTHER ACCESSORIES.
- I. REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION OF WORK.
4. CLEANING, REPAIR, AND REPLACEMENT
- A. GENERAL: CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT THAT WILL REMAIN OR ARE TO BE REUSED.
- B. PANELBOARDS: CLEAN EXPOSED SURFACES AND TIGHTEN ALL ELECTRICAL CONNECTIONS. REPLACE DAMAGED CIRCUIT BREAKERS AND PROVIDE CLOSURE PLATES FOR VACANT POSITIONS. PROVIDE TYPED SCHEDULES SHOWING REVISED CIRCUITING INFORMATION.
- C. LUMINAIRES: REMOVE EXISTING LUMINAIRES FOR CLEANING. USE MILD DETERGENT TO CLEAN EXTERIOR AND INTERIOR SURFACES. RINSE CLEAN WITH CLEAN WATER AND WIPE DRY. REPLACE EXISTING LAMPS AND BALLASTS WITH NEW.
5. DISPOSAL
- A. OWNER SHALL HAVE RIGHT TO RETAIN ANY EQUIPMENT OR MATERIALS THAT HAVE BEEN DEMOLISHED PRIOR TO DISPOSAL OR REMOVAL FROM SITE.
- B. ANY EQUIPMENT OR MATERIALS NOT WANTED BY THE OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM SITE.
- C. CONTRACTOR SHALL COMPLY WITH ENVIRONMENTAL LAWS AND REGULATIONS FOR DISPOSAL OF DEMOLISHED MATERIALS AND EQUIPMENT.

ELECTRICAL GENERAL NOTES

1. CODES
- THE WORK SHALL COMPLY WITH ALL APPLICABLE LOCAL, MUNICIPAL, AND NATIONAL CODES. WHERE THE CONSTRUCTION DOCUMENTS INDICATE MORE RESTRICTIVE REQUIREMENTS THE CONSTRUCTION DOCUMENTS SHALL GOVERN. HOWEVER, THE CONSTRUCTION DOCUMENTS SHALL NOT BE INTERPRETED AS AUTHORITY TO VIOLATE ANY CODE OR REGULATION.
2. DRAWINGS AND SPECIFICATIONS
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND COMPLYING WITH BOTH THE DRAWINGS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN THE DRAWINGS, NOTES, SPECIFICATIONS, OR CODES, THE REFERENCE WHICH PROVIDES THE MORE COMPLETE OR HIGHER STANDARD SHALL PREVAIL.
3. INTERPRETATION OF THE DOCUMENTS
- CAREFULLY COMPARE THE DRAWINGS AND SPECIFICATIONS, CHECKING MEASUREMENTS AND CONDITIONS UNDER WHICH THIS INSTALLATION IS TO BE MADE. FOR CLARIFICATION BETWEEN VARIOUS DRAWINGS, BETWEEN DRAWINGS OR SPECIFICATION, OR BETWEEN SECTIONS OF THE SPECIFICATION, THE MATTER SHALL BE REFERRED TO THE ENGINEER BEFORE ANY WORK IS EXECUTED. THE CONTRACTOR SHALL STATE IN THEIR PROPOSAL ANY EXCEPTIONS NECESSARY TO MAKE THIS A COMPLETE, READY TO USE INSTALLATION. IF NOT STATED IN THE PROPOSAL, IT WILL NOT BE CONSIDERED EXTRA.
4. ELECTRICAL DRAWINGS
- THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL DOORS, WALLS, FURNITURE, EQUIPMENT, ETC., THE LOCATION OF RACEWAY SYSTEM COMPONENTS IS SCHEMATIC. THE EXACT LOCATION OF RACEWAY SYSTEM COMPONENTS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD. THE CONTRACTOR SHALL CONFIRM THE DIMENSIONS OF THE ACTUAL EQUIPMENT TO BE SUPPLIED FOR THIS PROJECT, AND VERIFY CLEARANCES AND ROUGH-IN BEFORE STARTING WORK.
5. SITE EXAMINATION
- BEFORE SUBMITTING A BID, THE CONTRACTOR SHALL VISIT THE SITE, EXAMINE THE PREMISES, AND MAKE A THOROUGH SURVEY OF THE EXISTING CONDITIONS. THE SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. NO CONSIDERATION OR ALLOWANCE WILL BE GRANTED FOR FAILURE TO VISIT THE SITE OR FOR LATER CLAIMS FOR EQUIPMENT, MATERIALS, REQUIRED, OR FOR DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN SITE EXAMINATION BEEN MADE.
6. COORDINATION WITH OTHER TRADES
- THE ELECTRICAL CONTRACTOR SHALL OBTAIN A COMPLETE SET OF ARCHITECTURAL AND ENGINEERING DOCUMENTS AND COORDINATE WITH MECHANICAL, PLUMBING, ARCHITECTURAL, AND OTHER TRADES FOR EXACT DIMENSIONS, CLEARANCES, ROUGH-IN LOCATIONS, AND OTHER ADDITIONAL SCOPES OF WORK THAT MAY NOT BE SHOWN ON THE ELECTRICAL PLANS. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL 120 VOLT (AND HIGHER) AC POWER TO OTHER TRADES EQUIPMENT AND HARDWARE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, CONTROLS, FIRE AND SECURITY SYSTEMS, MOTORIZED DOORS, DAMPERS, LIFTS, AND OTHER SYSTEMS, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE ELECTRICAL PLANS. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL SAFETY DISCONNECT SWITCHES TO MECHANICAL EQUIPMENT.
7. PERMITS, APPLICATIONS AND RELEASES
- THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS, APPLICATIONS, RELEASES AND FEES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES FOR THE EXECUTION OF THIS WORK. SCHEDULING OF ALL REQUIRED INSPECTIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
8. FIRE STOPPING
- ALL PENETRATIONS IN WALL, FLOOR OR CEILING SHALL BE SUITABLY CLOSED UP AND SEALED WITH AN INTUMESCENT FIRE STOPPING COMPOUND LISTED IN THE MOST RECENT FACTORY MUTUAL RESEARCH CORPORATION (FMRC) APPROVAL GUIDE. FIRE STOPPING PRODUCTS SHALL BE MANUFACTURED BY 3M COMPANY OR APPROVED EQUAL.
9. PAINTING
- ALL NEWLY INSTALLED EXPOSED PIPING SHALL BE PAINTED TO MATCH THE EXISTING ADJACENT WALL OR CEILING SURFACE.
10. OWNER FURNISHED EQUIPMENT
- EQUIPMENT THAT WILL BE FURNISHED BY THE OWNER WILL BE INDICATED ON A SEPARATE SPECIFIED SCHEDULE. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR DELIVERY SCHEDULES. THE CONTRACTOR IS TO ASSUME THAT ON SITE STORAGE MAY NOT BE AVAILABLE WHEN COORDINATING DELIVERY OF EQUIPMENT. THE CONTRACTOR, IN COORDINATION WITH THE OWNER'S REPRESENTATIVE, WILL INSPECT THE DELIVERY FOR ACCURACY AND SHIPMENT DAMAGE AND ACCEPTING THE EQUIPMENT. THE CONTRACTOR SHALL BE RESPONSIBLE TO STORE, PROTECT AND ULTIMATELY INSTALL THE EQUIPMENT.
11. ELECTRICAL SERVICE DISRUPTIONS
- ALL WORK WHICH EXPOSES ACTIVE BUS REQUIRES A WRITTEN NOTIFICATION TO THE OWNER BEFORE WORKING ON ANY ENERGIZED ELECTRICAL SYSTEM. ALL POWER DISRUPTION SHALL OCCUR AT TIMES AND OF DURATIONS ACCEPTABLE TO THE OWNER.
12. EQUIPMENT
- ALL MATERIALS AND EQUIPMENT USED IN THIS INSTALLATION SHALL BE NEW, AND HAVE THE APPROPRIATE UL LISTING AND LABEL.

13. MISCELLANEOUS SUPPORTING MEMBERS
- ALL ANGLES CHANNELS, AND OTHER MISCELLANEOUS STEEL, BOLTS, RODS, ETC., REQUIRED TO SUPPORT LIGHT FIXTURE, CONDUIT, RACEWAY, LADDER TRAY, OR OTHER ELECTRICAL EQUIPMENT OR DEVICES SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
14. PANELBOARDS
- ALL PANELBOARDS SHALL BE PROVIDED WITH TYPEWRITTEN DIRECTORIES. SEE PANEL SCHEDULES ON THE DRAWINGS AND SPECIFICATIONS FOR COMPLETE IDENTIFICATION AND LABELING REQUIREMENTS.
15. SAFETY
- THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO ENSURE THE SAFETY OF THE OWNER'S EMPLOYEES, BUILDING EMPLOYEES AND GUESTS, AS WELL AS THEIR OWN FORCES, BY ADEQUATELY PROTECTING ANY EXPOSED LIVE CONDUCTORS, OR DEVICES THROUGHOUT THE COURSE OF THIS WORK.
- COMPLY WITH NFPA 241 FOR SAFEGUARDING DURING CONSTRUCTION AND ALTERATION OPERATIONS. IN ADDITION, ANY OPENINGS IN FIRE RATED SEPARATIONS BETWEEN OCCUPIED AND UNOCCUPIED (OR OPERATIONAL AND NON-OPERATIONAL) AREAS SHALL BE SEALED AT THE END OF EACH WORK DAY WITH AN APPROPRIATE FIRE RATED ENCLOSURE OR SEALANT. DO NOT COMPROMISE EXISTING SECURITY OR FIRE ALARM SYSTEMS SERVING THE OCCUPIED OR OPERATIONAL AREAS.
16. EQUIPMENT CONNECTIONS
- PROVIDE FINAL ELECTRICAL CONNECTIONS TO ALL EQUIPMENT FURNISHED UNDER OTHER TRADES AND FOR ALL OWNER FURNISHED EQUIPMENT. PROVIDE A FLEXIBLE LIGHT TIGHT CONNECTION TO ALL VIBRATION PRODUCING EQUIPMENT.
17. INTERFERENCE WITH OCCUPANCY
- THE PRESENT BUILDING IS OCCUPIED AND WILL CONTINUE TO BE DURING THE PROGRESS OF THIS WORK. IT IS IMPERATIVE, THEREFORE, THAT THE WORK COVERED BY THESE DOCUMENTS BE EXECUTED WITH A MINIMUM OF INCONVENIENCE TO THE BUILDING PERSONNEL, AND OTHER TENANTS.
18. TEMPORARY REQUIREMENTS
- PROVIDE TEMPORARY LIGHTING, POWER, AND FIRE ALARM COMPONENTS AS REQUIRED IN AREAS UNDERGOING WORK DURING CONSTRUCTION.
- FURNISH AND INSTALL ONE OSHA APPROVED PIGTAIL SOCKET WITH 150-WATT LAMP FOR EVERY 500 SQUARE FEET OF FLOOR SPACE AND A MINIMUM 1 PER ROOM. THE TEMPORARY LIGHTING SHALL BE LEFT IN PLACE UNTIL PERMANENT LIGHTING IS COMPLETELY OPERATIONAL.
- FURNISH AND INSTALL POWER OUTLETS TO A TOTAL ONE FOR EVERY 2000 SQUARE FEET OR PART THEREOF OF FLOOR AREA AND THESE SHALL BE 15 AMP, SINGLE PHASE RECEPTACLES FOR EITHER 110 OR 220 VOLTS AS DIRECTED BY THE GENERAL CONTRACTOR. COORDINATE FOR ADDITIONAL TEMPORARY POWER REQUIREMENTS WITH OTHER TRADES AND PROVIDE AN ADEQUATE INSTALLATION.
- FURNISH AND INSTALL AN APPROVED TEMPORARY FIRE ALARM SYSTEM AS REQUIRED BY LOCAL CODES AND AUTHORITY HAVING JURISDICTION.
- ALL TEMPORARY ELECTRICAL EQUIPMENT SHALL BE REMOVED BEFORE THE AREA CEILING IS INSTALLED.
19. UTILITY POWER COORDINATION
- THE CONTRACTOR SHALL PERFORM ALL COORDINATION AND SCHEDULING OF LOCAL UTILITY POWER COMPANY WORK EFFORT. ANY EXCESS FACILITIES CHARGES WILL BE PAID BY THE OWNER WITHOUT MARK-UP. CONTRACTOR SHALL PROVIDE ALL WORK REQUIRED FOR THE NEW ELECTRICAL SERVICE.
20. CABLING
- BRANCH CIRCUITS TO RECEPTACLES, LIGHTING AND MISC. SMALL LOADS (15 OR 20 AMP CIRCUITS), UNLESS SPECIFICALLY NOTED OTHERWISE, SHALL BE #12, 1#12G, - 3/4" C. SEE NOTE BELOW FOR ADDITIONAL REQUIREMENTS. MINIMUM SIZE WIRE SHALL BE #12 AWG AND MINIMUM SIZE CONDUIT SHALL BE 3/4" TRADE SIZE.
21. CABLING SIZES
- BRANCH CIRCUIT CABLE SIZING SHALL BE BASED ON THE VALUES INDICATED BELOW:
- A. 120/208V CABLING FROM PANEL TO THE ELECTRICAL LOAD SHALL BE ADJUSTED AS FOLLOWS UNLESS SPECIFICALLY NOTED OTHERWISE:
- 0' - 100' #12 AWG MINIMUM
100' - 200' #10 AWG MINIMUM
200' - 250' #8 AWG MINIMUM
- B. 277/480V CABLING FROM PANEL TO THE ELECTRICAL LOAD SHALL BE ADJUSTED AS FOLLOWS UNLESS SPECIFICALLY NOTED OTHERWISE:
- 0' - 150' #12 AWG MINIMUM
150' - 250' #10 AWG MINIMUM
250' - 300' #8 AWG MINIMUM
22. SPECIAL LUG REQUIREMENTS
- ANY CABLE WHICH TERMINATES DIRECTLY ON TO A BUS BAR SHALL BE 2 BOLT LONG BARREL TYPE WITH INSPECTION HOLES PRODUCED WITH NON FLASHING TYPE DIES AS MANUFACTURED BY BETHLEHEM BETTS OR APPROVED EQUAL. MINIMUM 10 TONS OF COMPRESSION. HEX CRIMP. THE USE OF HEAT SHRINK TUBING IS EXPLICITLY FORBIDDEN. THERE SHALL BE NO "SHINERS" AT THE LUGS.

EQUIPMENT

TAG	EQUIPMENT	LOAD				CIRCUIT 1 FED FROM			CIRCUIT 2 FED FROM			REMARKS				
		V/Ø/Hz	CAPACITY (kW)	CIRCUIT 1 MCA	CIRCUIT 2 MCA	SOURCE NAME	CIRCUIT BREAKER (AMP-POLE)	SWITCH SIZE (AMP-POLE)	FUSE SIZE (AMPS)	SOURCE NAME	CIRCUIT BREAKER (AMP-POLE)		SWITCH SIZE (AMP-POLE)	FUSE SIZE (AMPS)		
ACC-E2	EAST CHILLER	480/3	333.8	302.4	294.7	MSB-1	-	400A-3P	400A	1 SET OF 3-350 KCMIL, 1#36, 3°C.	MN	400A-3P	-	-	1 SET OF 3-350 KCMIL, 1#36, 3°C.	⊙

NOTES:
 (1) PROVIDE NEW FUSES IN EXISTING SWITCH.
 (2) PROVIDE NEW BREAKER.
 (3) PROVIDE NEW FEEDERS IN EXISTING CONDUIT. PROVIDE NEW FLEX CONDUIT FROM EXISTING ROOF PENETRATION TO NEW CHILLER.
 (4) PROVIDE ENERGY METER FOR CIRCUIT 2 EQUAL TO SCHNEIDER ELECTRIC ACTI 9 IEM 3X65 SERIES WITH BACNET MS/TP INTERFACE. COORDINATE WITH CONTROLS CONTRACTOR

POWER SYMBOLS

DESIGNATION	DESCRIPTION
⊙	JUNCTION BOX
X Y	EQUIPMENT TAG SEE EQUIPMENT SCHEDULE
⌒	FLEXIBLE CONDUIT
M	MOTOR M=HP
VFD	VARIABLE FREQUENCY DRIVE
□	MOTOR CONTROL CENTER

Grumman/Burkus Associates
Energy Efficiency Consultants and Sustainable Design Engineers

820 Davis St, Ste 300
Evanston, Illinois 60201 4446
847 328-3555 www.grummanburkus.com

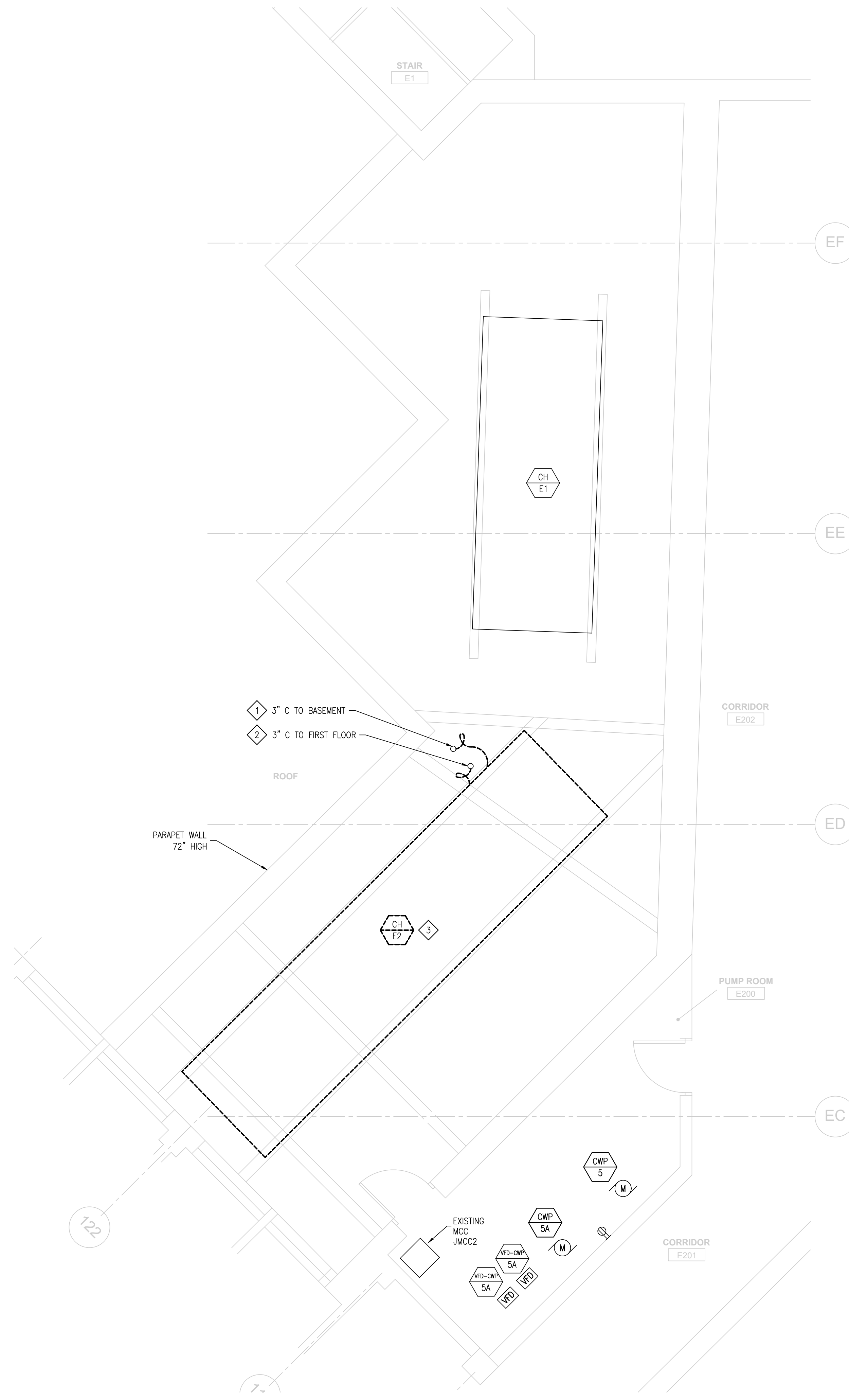
JAIL CHILLER REPLACEMENT
MCHENRY COUNTY GOVERNMENT CENTER
2200 NORTH SEMINARY AVENUE
WOODSTOCK, IL 60098

ELECTRICAL SYMBOLS, GENERAL NOTES, SPECIFICATIONS, AND SCHEDULES

DATE: 10/27/23
 SCALE: NONE
 DRAWN: MSB
 CHECKED: MSB
 APPROVED: MSB
 JOB NO: P22-192-00

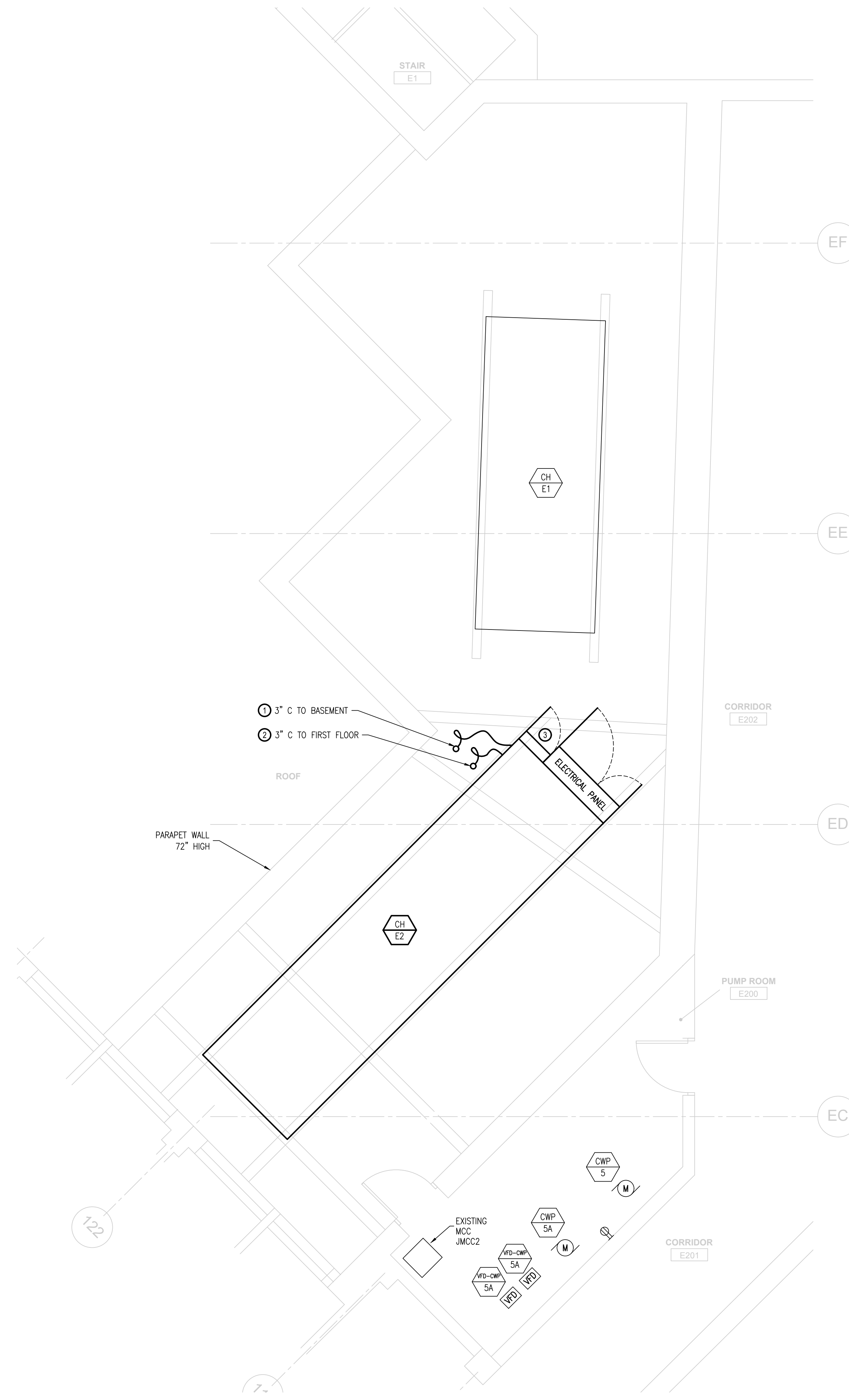
ISSUES & REVISIONS
 NO. DESCRIPTION
 11/02/23
 ISSUED FOR BID
 ISSUED FOR PERMIT

E0.1



1 ROOF AND PUMP ROOM PLAN - DEMOLITION
Scale: 1/4" = 1'-0"

- DEMOLITION PLAN NOTES**
- DISCONNECT AND REMOVE CHILLER WIRING BACK TO SOURCE. REMOVE FLEX CONDUIT BETWEEN CHILLER AND ROOF PENETRATION. RETAIN INTERIOR CONDUIT FOR REUSE IN NEW CONSTRUCTION.
 - DISCONNECT AND REMOVE CHILLER WIRING BACK TO SOURCE. REMOVE FLEX CONDUIT BETWEEN CHILLER AND ROOF PENETRATION. RETAIN INTERIOR CONDUIT FOR REUSE IN NEW CONSTRUCTION.
 - REMOVE AUXILIARY WIRING AND CONDUIT CONNECTED TO CHILLER THAT IS MADE OBSOLETE BY DEMOLITION OF THE CHILLER.



2 ROOF AND PUMP ROOM PLAN - NEW WORK
Scale: 1/4" = 1'-0"

- CONSTRUCTION PLAN NOTES**
- CONNECT CIRCUIT 1 OF NEW CHILLER PER EQUIPMENT SCHEDULE ON DRAWING E.D.O. RUN NEW WIRE IN EXISTING CONDUIT MADE AVAILABLE BY DEMOLITION. PROVIDE NEW FLEX CONDUIT FROM ROOF PENETRATION TO NEW CHILLER. PROVIDE NEW FUSES IN EXISTING CHILLER SWITCH.
 - CONNECT CIRCUIT 2 OF NEW CHILLER PER EQUIPMENT SCHEDULE ON DRAWING E.D.O. RUN NEW WIRE IN EXISTING CONDUIT MADE AVAILABLE BY DEMOLITION. PROVIDE NEW FLEX CONDUIT FROM ROOF PENETRATION TO NEW CHILLER. PROVIDE NEW BREAKER IN MOTOR CONTROL CENTER.
 - INSTALL CHILLER DISPLAY HEATER KIT ACCESSORY PROVIDED WITH CHILLER. SEE EXHIBIT IN CHILLER MANUAL FOR ADDITIONAL INFORMATION. COORDINATE WITH MECHANICAL CONTRACTOR.

- GENERAL NOTES**
- FIELD VERIFY EXACT LOCATION OF ALL EXISTING EQUIPMENT PRIOR TO STARTING DEMOLITION.
 - VERIFY EXACT LOCATION OF ALL NEW EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.



Grumman/Butkus Associates
Energy Efficiency Consultants and Sustainable Design Engineers
820 Davis St, Ste 300
Evanston, Illinois 60201 4446
847 328-3555 www.grummanbutkus.com
Copyright © 2013 GrummanButkus Associates Illinois Registration # 184-00066

ISSUES & REVISIONS	NO.	DESCRIPTION	DATE
ISSUED FOR BID			11/02/23
ISSUED FOR PERMIT			

ROOF AND PUMP ROOM ELECTRICAL PLAN - DEMOLITION AND NEW WORK
JAIL CHILLER REPLACEMENT
MCHENRY COUNTY GOVERNMENT CENTER
2200 NORTH SEMINARY AVENUE
WOODSTOCK, IL 60098

DATE	10/27/23
SCALE	1/4" = 1'-0"
DRAWN	MBS
CHECKED	JS
APPROVED	MBS
DATE	11/02/23

E1.0

