

# STATE OF NEW JERSEY

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N.J. DEPARTMENT OF THE TREASURY  
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DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION  
THOMAS A. EDENBAUM, DIRECTOR

DEPARTMENT OF TRANSPORTATION  
FRANCIS K. O'CONNOR, COMMISSIONER

BOILER PLANT CONTROLLER UPGRADE  
DOT SOUTH REGION HEADQUARTERS  
CHERRY HILL, CAMDEN COUNTY, NJ

DPMC PROJECT NO. T0715-01



**M&E**  
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PROJECT TITLE / DESCRIPTION:  
**NJDOT PROJECT #T0715-01  
CHERRY HILL HQ BOILER  
PLANT CONTROLLER UPGRADE**

FACILITY LOCATION:  
**NJDOT SOUTH  
REGION HEADQUARTERS  
CHERRY HILL, NJ**

GLC NO.: SERIAL NO.:

DATE: JUNE 6, 2025

NO.	REVISION:	DATE:
1	ISSUE FOR PERMIT	09/05/25

M&E PROJECT NO:  
4013-2

DRAWING TITLE:  
COVER SHEET

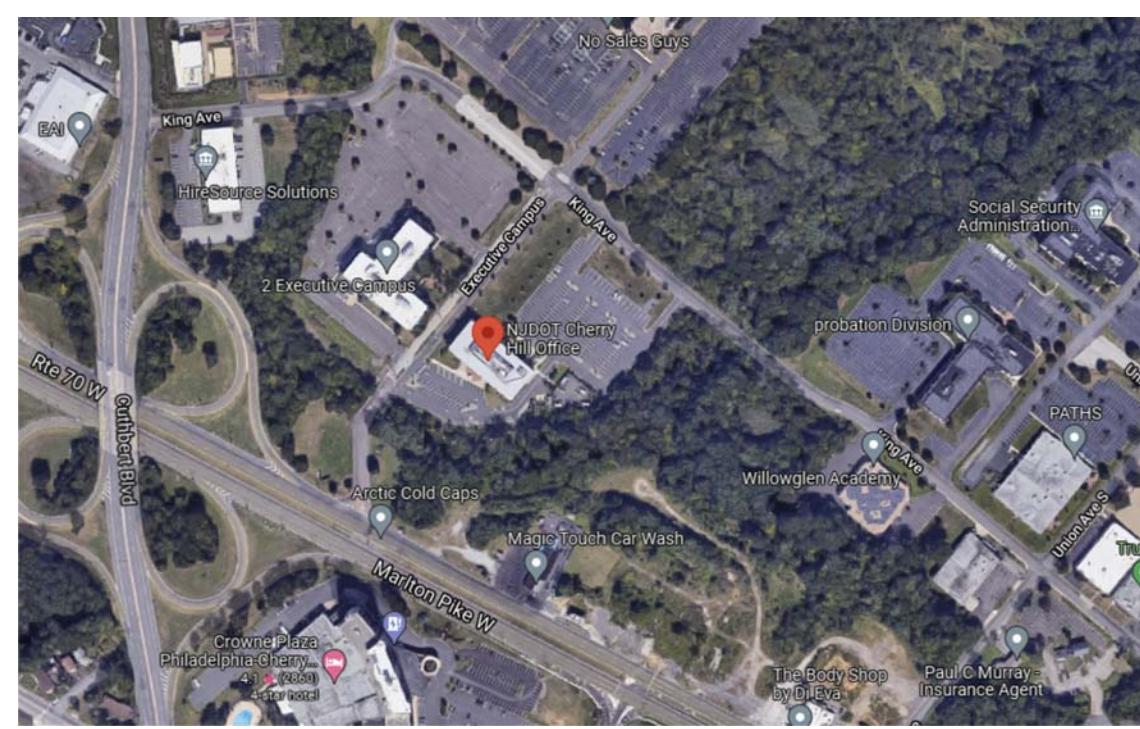
SHEET NUMBER:  
C001

SHEET 1 OF 3

DESCRIPTION OF WORK
INTENT OF THIS PROJECT IS TO PROVIDE NEW BOILER CONTROL PANEL FOR BOILERS LOCATED IN MECHANICAL ROOM LOCATED ON THE ROOF.

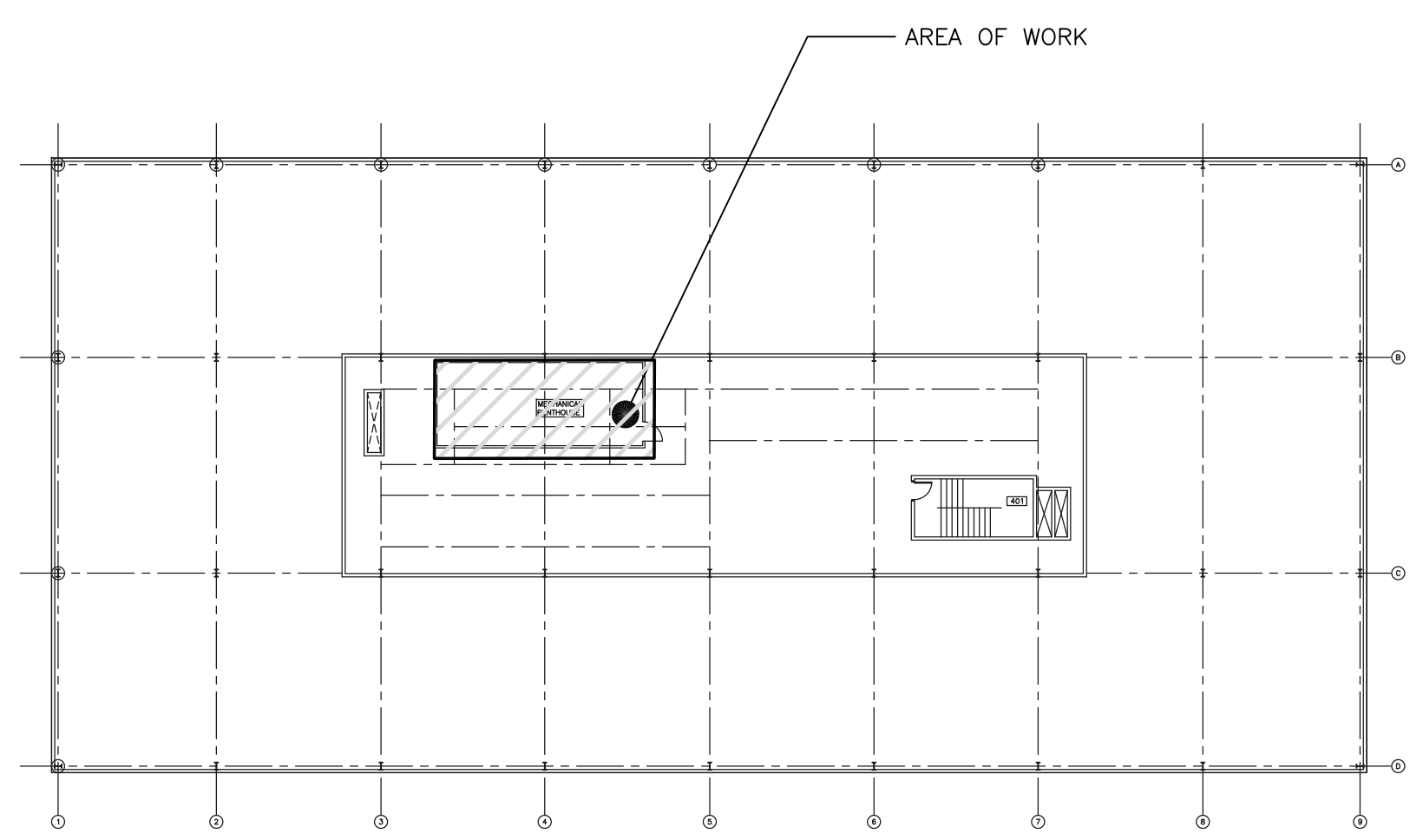
BUILDING CODE INFORMATION	
EXISTING 3 STORY BUILDING (CIRCA 1983)	
CONSTRUCTION TYPE:	IIB (NON-COMBUSTIBLE)
USE GROUP:	B (BUSINESS - OFFICES)
EXISTING SQUARE FOOTAGE:	
FIRST FLOOR	14,975 SQ. FT.
SECOND FLOOR	18,500 SQ. FT.
THIRD FLOOR	18,440 SQ. FT.
PENTHOUSE	400 SQ. FT.
TOTAL	52,315 SQ. FT.
SUBMITTED UNDER IBC 2021 (NEW JERSEY EDITION), NEC 2020, AND IMC 2021. THESE PLANS ARE SUBMITTED IN CONFORMANCE WITH NJ UNIFORM CONSTRUCTION CODE SUBCHAPTER 6 - REHABILITATION SUBCODE.	
1. THE WORK IS DEEMED "ALTERATION" AS PER SECTION 5.23-6.3 DEFINITIONS.	
2. AS PER SECTION 5.23-6.6, THE FOLLOWING IS PROVIDED: • NO COMPROMISE BY DIMINUTION OF BUILDING SYSTEMS IS PROPOSED. ELECTRICAL MATERIALS COMPLY WITH UL AND FM APPROVALS PER NEC CODE PROVISIONS.	
3. THE BUILDING AND WORK AREAS SHALL REMAIN OCCUPIED THROUGHOUT CONSTRUCTION AND THE PROJECT IS THEREFORE NOT CLASSIFIED AS A "RECONSTRUCTION" UNDER THE REHABILITATION SUBCODE.	
4. BUILDING IS FULLY SPRINKLERED.	

WORK LEGEND		
	NEW	
	NEW (CONCEALED OR HIDDEN)	
	TEMPORARY	
	DEMOLITION	
	EXISTING (E) TO REMAIN	
GENERAL DRAWING SYMBOLS		
	EQUIPMENT OR FIXTURE TYPE NUMBER	EQUIPMENT TAG
	DRAWING GRID LOCATION DRAWING NUMBER	DRAWING SECTION
	DRAWING GRID LOCATION DRAWING NUMBER	DETAIL REFERENCE
	CONNECT NEW TO EXISTING	
	TEMPORARY CONNECTION	
	MECHANICAL KEYNOTE REFERENCE	
	ELECTRICAL KEYNOTE REFERENCE	
	REVISION NUMBER	
	DRAWING GRID LOCATION	
	MATCH/BREAK LINE	

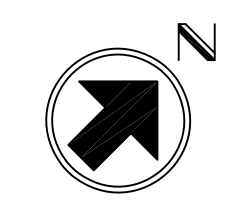


AREA MAP

- GENERAL NOTES:
- ALL WORK SHALL CONFORM TO FEDERAL, STATE, AND LOCAL BUILDING CODES AND ORDINANCES, AND ALL OTHER AGENCIES HAVING JURISDICTION.
  - THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION METHODS, PROCEDURES AND TECHNIQUES.
  - ALL WORK SHALL BE COMPLETED DURING NORMAL WORKING HOURS UNLESS OTHERWISE SPECIFIED OR IF PRIOR APPROVAL IS GRANTED FROM OWNER.
  - AT THE END OF THE WORK DAY, CONTRACTORS SHALL CLEAN UP THE WORK AREA.
  - CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL REQUIREMENTS SET FORTH IN THE OWNER'S CONTRACTOR REQUIREMENTS.



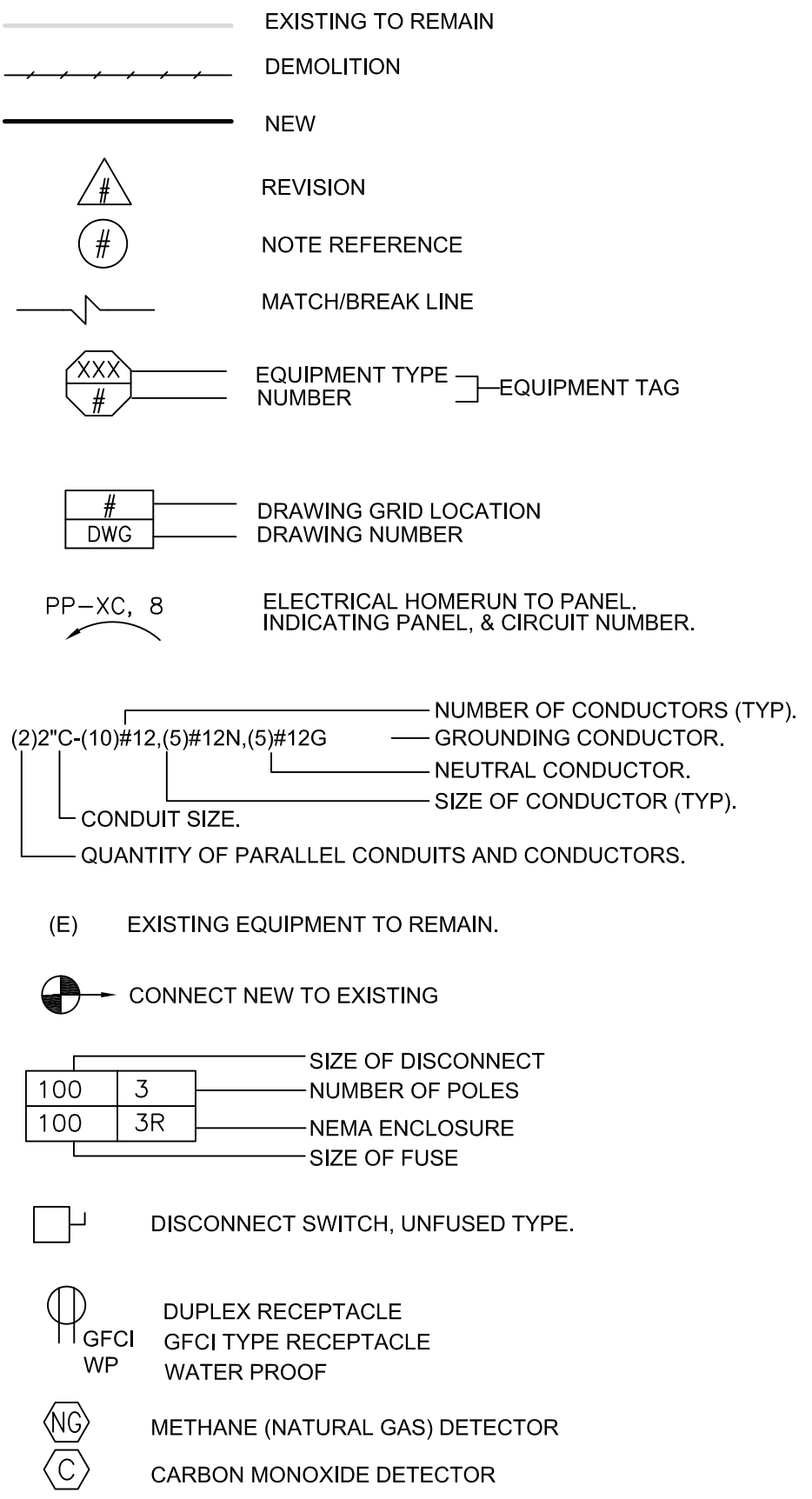
ROOF KEY PLAN  
SCALE: NONE



DRAWING INDEX	
NO.	DRAWING TITLE
C001	COVER SHEET
E201	ELECTRICAL NEW WORK - ROOF PART PLAN
E601	ELECTRICAL SPECIFICATIONS

Z:\2025\Projects\4013-2 Cherry Hill - HQ Boiler Plant Controller Upgrade (W062)4013-2.DWG (W062)4013-2.DWG (W062)4013-2.DWG 24/06/2025 5:18:14 PM gsydowski

# LEGEND

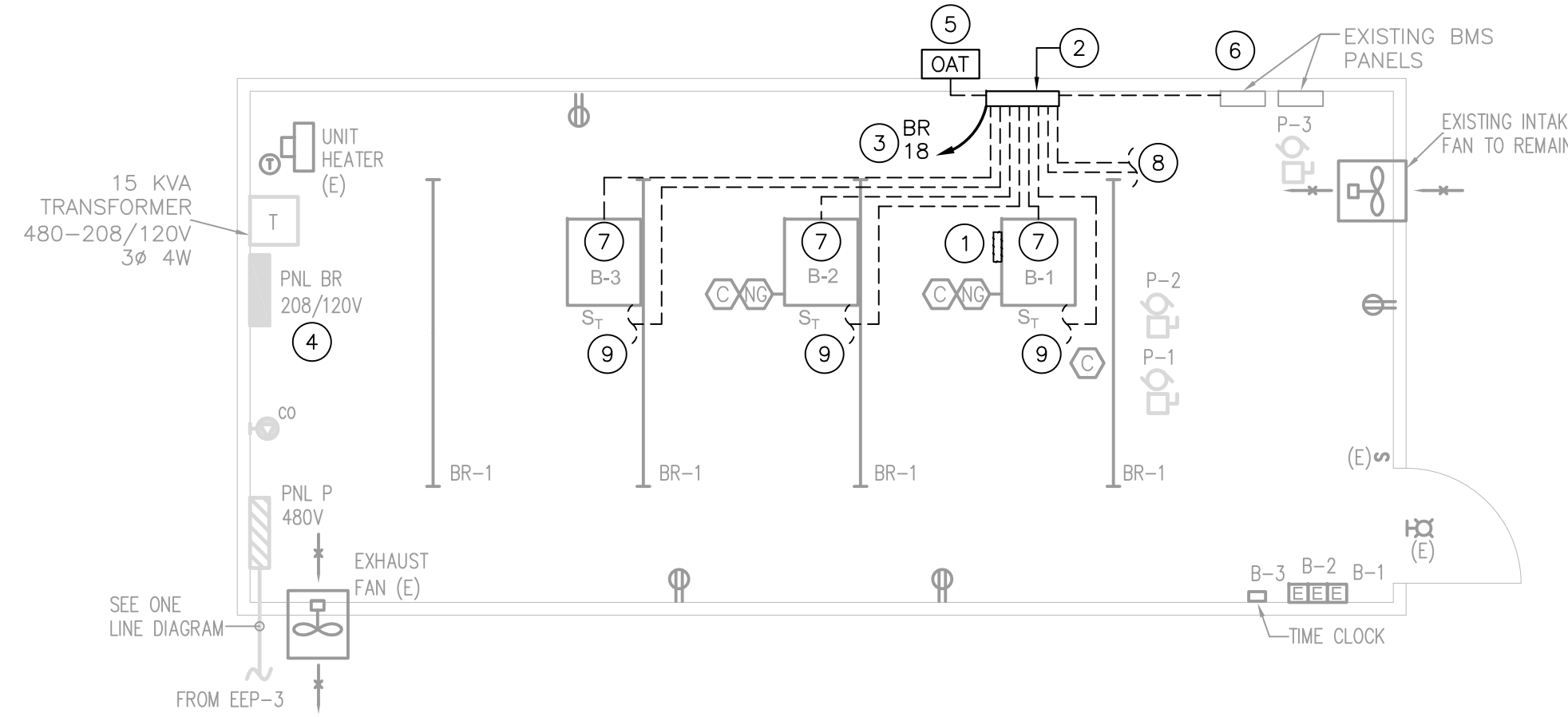


## GENERAL NOTES:

1. VERIFY FIELD CONDITIONS PRIOR TO START OF CONSTRUCTION.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. COORDINATE AND CONFIRM CONTROLS WIRING TYPE AND ROUTE WITH CONTROLS CONTRACTOR. REFER TO CONTROLS RISER DIAGRAM FOR CONTROLS WIRING AND CONDUIT REQUIREMENTS.
4. NOTE THAT EXISTING BOILER PRIMARY PUMPS (P-1, P-2) AND FTR PUMP (P-3) ARE CONTROLLED BY MAIN BMS PANEL.
5. EXISTING CARBON MONOXIDE AND NATURAL GAS (METHANE) DETECTORS MOUNTED TO EACH BOILER SHALL REMAIN. PRIOR TO START OF WORK, CONFIRM WHETHER BOILERS SHUT DOWN AND ALARM OR ALARM ONLY UPON DETECTION. AFTER WORK IS COMPLETED, TEST TO ENSURE DETECTORS AND BOILER CONTINUE TO OPERATE AS PRESENTLY INSTALLED.
6. EXISTING BOILER MANUAL SHUTDOWN SWITCHES ADJACENT TO DOORWAY SHALL REMAIN. AFTER NEW WORK IS COMPLETED, CONFIRM BOILERS CONTINUE TO SHUT DOWN UPON ACTIVATION OF SHUTDOWN SWITCHES.

## KEY NOTES:

1. EXISTING AERCO CASCADE CONTROLLER TO BE REMOVED. PREP BOILERS FOR REWIRING AND REPROGRAMMING TO ACCEPT NEW THIRD PARTY BOILER PLANT CONTROLLER. CONTRACTOR SHALL ENGAGE AERCO APPROVED TECHNICIAN TO ASSIST IN REPROGRAMMING. REMOVE ALL WIRING AND CONDUIT THAT IS MADE OBSOLETE AS A RESULT OF THIS WORK.
2. PROVIDE NEW TEKMAR 284 BOILER CONTROLLER OR APPROVED EQUAL ALTERNATIVE MANUFACTURERS HONEYWELL WEBS AND JOHNSON FX ARE ALSO ACCEPTABLE. NEW CONTROLLER SHALL HAVE BACNET IP COMMUNICATION, ONE OUTSIDE AIR SENSOR (TEKMAR 070) AND TWO PIPE TEMPERATURE SENSORS (TEKMAR 082). PROVIDE NEW ENCLOSURE FOR CONTROLLER.
3. PROVIDE NEW POWER FEED FROM EXISTING PANEL BR WITHIN BOILER PENTHOUSE. POWER FEED SHALL BE 2#12,1#12G IN 3/4" EMC.
4. PROVIDE (1) NEW 15A/1P CIRCUIT BREAKER IN EXISTING PANEL BR FOR BOILER CONTROL PANEL. CIRCUIT BREAKER SHALL MATCH EXISTING IN MANUFACTURER, STYLE, TYPE, AND HIGHEST AIC RATING. REFER TO PANEL SCHEDULE FOR RELATED WORK.
5. PROVIDE NEW OUTSIDE AIR SENSOR (TEKMAR 070) WITHIN MANUFACTURERS ENCLOSURE. COORDINATE FINAL LOCATING WITH FIELD CONDITIONS AND ENSURE SENSOR IS NOT LOCATED IN DIRECT SUNLIGHT. PROVIDE WEATHERPROOF SEAL IN ALL PENETRATIONS OF EXTERIOR PANELS.
6. INTEGRATE NEW BOILER CONTROL PANEL INTO EXISTING BMS PANELS VIA BACNET IP CONNECTION. EXISTING BMS IS HONEYWELL WEBS (NIAGARA) BASED SYSTEM. CONTROLS CONTRACTOR TO PROGRAM BMS AND BOILER CONTROL PANEL AS NOTED IN SEQUENCE OF OPERATIONS. PROVIDE ADDITIONAL RELAYS, WIRING AND CONTROLS COMPONENTS AS REQUIRED TO PROVIDE A COMPLETE AND WORKING SYSTEM.
7. PROVIDE NEW CONTROLS WIRING BETWEEN BOILER CONTROL PANEL AND EACH BOILER.
8. PROVIDE NEW HOT WATER SUPPLY AND RETURN HEADERS SENSORS (TEKMAR 082) AND WIRE BACK TO BOILER CONTROL PANEL. FIELD COORDINATE LOCATION OF SENSORS SO THAT THEY ARE ADJACENT TO EXISTING BMS SENSORS. TEMPORARILY REMOVE PIPING INSULATION AND INSTALL SENSORS ON PIPING VIA STRAPS AS PER MANUFACTURERS INSTRUCTIONS. REINSTALL OR REPLACE INSULATION AND PATCH VAPOR BARRIER AS FIELD CONDITIONS REQUIRE.
9. PROVIDE NEW HOT WATER SUPPLY SENSORS (TEKMAR 082) AT EACH BOILER HOT WATER SUPPLY OUTLET AND WIRE BACK TO BOILER CONTROL PANEL. FIELD COORDINATE LOCATION OF SENSORS SO THAT THEY ARE ADJACENT TO BOILER SENSORS. TEMPORARILY REMOVE PIPING INSULATION AND INSTALL SENSORS ON PIPING VIA STRAPS AS PER MANUFACTURERS INSTRUCTIONS. REINSTALL OR REPLACE INSULATION AND PATCH VAPOR BARRIER AS FIELD CONDITIONS REQUIRE.



## ELECTRICAL WORK - BOILER PENTHOUSE

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

## SEQUENCE OF OPERATIONS

EXISTING BMS PROGRAMMING SHALL REMAIN UNCHANGED FOR HOT WATER SYSTEM CONTROLS/SETPOINTS AND BOILER ENABLE SEQUENCES.

### FOR REFERENCE, EXISTING HOT WATER SYSTEM SEQUENCES ARE AS FOLLOWS:

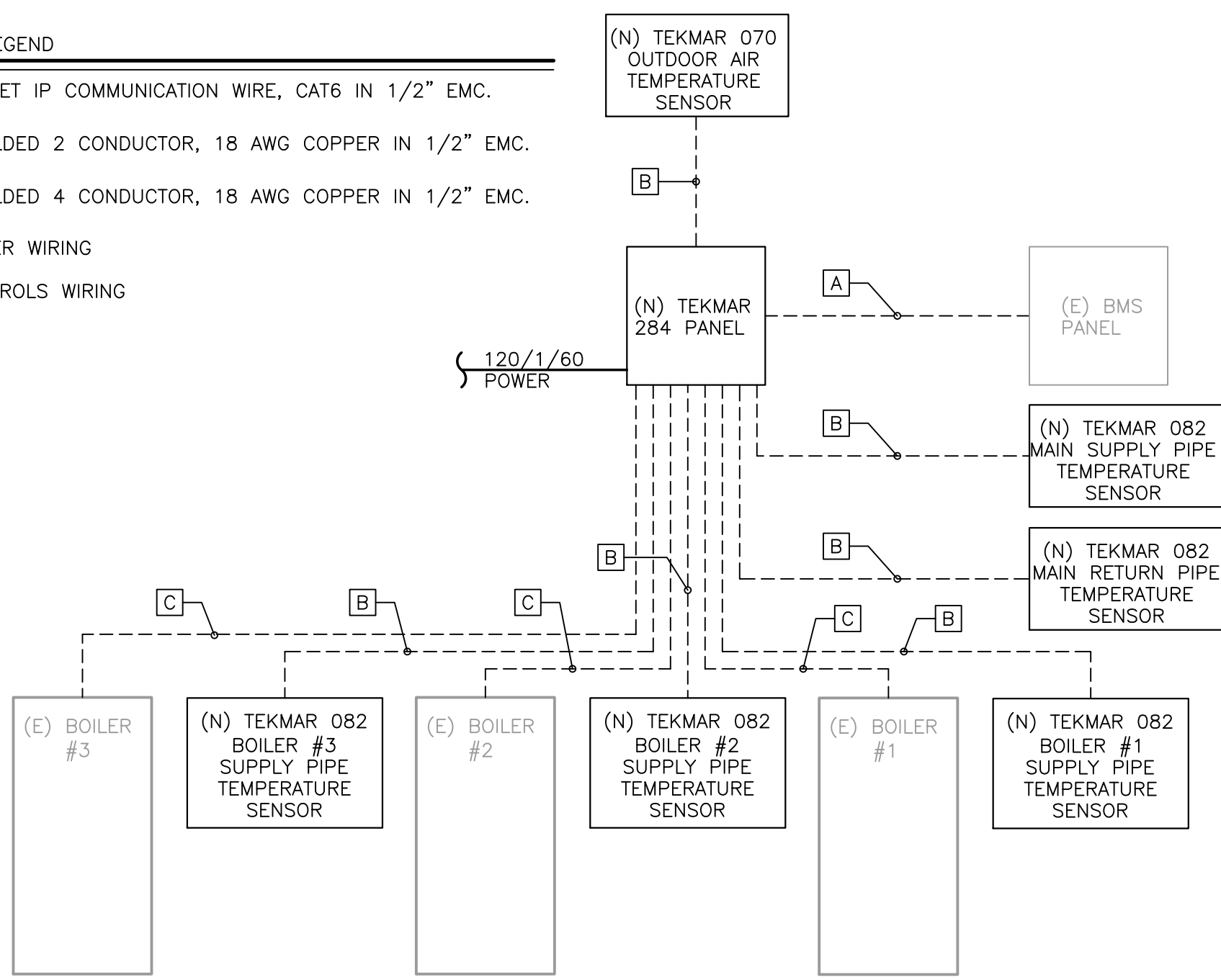
- THE HOT WATER SYSTEM SHALL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 58°F(ADJ.). THE HOT WATER SYSTEM SHALL ALSO BE ENABLED ANYTIME THE BUILDING IS OCCUPIED AND THE OUTDOOR AIR TEMPERATURE IS BELOW 72°F(ADJ.). THE HOT WATER SYSTEM SHALL ALSO BE ENABLED ANYTIME THERE IS A CALL FOR REHEAT FROM A VAV. ONCE THE HOT WATER SYSTEM IS ENABLED SHALL BE ENABLED FOR A MINIMUM OF 60MIN (ADJ.).
- WHEN THE HOT WATER SYSTEM IS ENABLED THE LEAD HOT WATER PUMP (PUMP 1 OR 2) SHALL BE ENABLED TO RUN. SHOULD THE LEAD PUMP FAIL TO RUN THE LAG PUMP SHALL BE COMMANDED ON. THE LEAD PUMP SHALL ALTERNATE WEEKLY BASED ON AN ADJUSTABLE SCHEDULE. THE HOT WATER PUMP SPEED SHALL BE MODULATED TO MAINTAIN THE DIFFERENTIAL PRESSURE AT 10PSI(ADJ.). ONCE THE HOT WATER PUMP IS AT MINIMUM SPEED THE BYPASS VALVE SHALL MODULATE TO MAINTAIN THE DIFFERENTIAL PRESSURE AT SETPOINT.
- ONCE STATUS OF A HOT WATER PUMP IS PROVEN THE BOILER(S) SHALL BE ENABLE TO RUN VIA THEIR INTERNAL CONTROLS TO MAINTAIN THE HOT WATER TEMPERATURE AT SETPOINT. THE HOT WATER TEMPERATURE SETPOINT SHALL BE RESET FROM 115°F(ADJ.) TO 180°F (ADJ.) AS THE OUTDOOR AIR TEMPERATURE DROPS FROM 65°F (ADJ.) TO 20°F (ADJ.).
- ALARMS:
  - HOT WATER SYSTEM ENABLED AND SUPPLY TEMPERATURE 10°F (ADJ.) BELOW SETPOINT FOR 30MIN (ADJ.)
  - HOT WATER PUMP FAILURE - PUMP COMMANDED ON BUT STATUS NOT PROVEN.
  - HOT WATER PUMP IN HAND - PUMP STATUS PROVEN BUT PUMP IS NOT COMMANDED ON.
  - EMERGENCY SHUTDOWN SWITCH

### NEW BOILER CONTROL PANEL (BCP) SEQUENCES:

- BOILER CONTROL PANEL SHALL RECEIVE ENABLE SIGNAL FROM BMS VIA BACNET IP CONNECTION AS NOTED ABOVE IN EXISTING SEQUENCES.
- THE BOILERS WILL OPERATE IN A PARALLEL MODULATIONS SEQUENCE TO MAINTAIN THE SYSTEM HOT WATER SUPPLY TEMPERATURE SETPOINT. SEE STAGING SEQUENCE BELOW.
- THE BCP SHALL ROTATE LEAD DUTY BASED ON RUNTIME (ADJ.) OR WEEKLY SCHEDULE (ADJ.) TO EQUALIZE BOILER WEAR AND RUNTIME
- BCP SHALL BE PROGRAMMED TO MATCH EXISTING HOT WATER RESET SEQUENCES. FIELD CONFIRM SETPOINTS PRIOR TO PROGRAMMING:
  - THE HOT WATER TEMPERATURE SETPOINT SHALL BE RESET FROM 115°F(ADJ.) TO 180°F (ADJ.) AS THE OUTDOOR AIR TEMPERATURE DROPS FROM 65°F (ADJ.) TO 20°F (ADJ.).
  - STAGING SEQUENCE (PARALLEL MODULATION)
    - CONTROLLER SHALL ACTIVATE THE MOST BOILERS POSSIBLE TO MEET THE REQUIRED LOAD.
    - LEAD BOILER SHALL BE BROUGHT ON TO MINIMUM MODULATION AND DOES NOT INCREASE MODULATION.
    - IF MORE BOILER OUTPUT IS REQUIRED, LAG 1 BOILER SHALL BE BROUGHT ON TO MINIMUM MODULATION AND DOES NOT INCREASE MODULATION.
    - IF MORE BOILER OUTPUT IS REQUIRED, LAG 2 BOILER SHALL BE BROUGHT ON TO MINIMUM MODULATION AND DOES NOT INCREASE MODULATION.
    - IF ADDITIONAL OUTPUT IS REQUIRED, ALL BOILERS SHALL MODULATE UP IN PARALLEL UNTIL THEY REACH THEIR MAXIMUM MODULATIONS SETTINGS.
    - THE REVERSE SHALL OCCUR AS THE BOILER OUTPUT REQUIREMENT DECREASES.
- REPROGRAM BOILERS TO SET HOT WATER SUPPLY TEMPERATURE TO 180°F UPON LOSS OF OUTSIDE AIR TEMPERATURE READING FROM GLOBAL AND LOCAL SENSOR.

## WIRING LEGEND

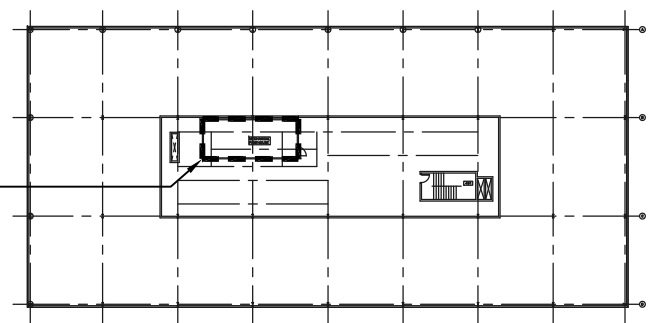
- A BACNET IP COMMUNICATION WIRE, CAT6 IN 1/2" EMC.
- B SHIELDED 2 CONDUCTOR, 18 AWG COPPER IN 1/2" EMC.
- C SHIELDED 4 CONDUCTOR, 18 AWG COPPER IN 1/2" EMC.
- POWER WIRING
- - - CONTROLS WIRING



## CONTROLS RISER DIAGRAM

SCALE: NONE

AREA OF WORK



## KEYPLAN

SCALE: 1/64"=1'-0"

JOB NAME: CHERRY HILL - BOILER PLANT CONTROLLER UPGRADE				PANEL BR				JOB NO.: 4013-2				
RATING: 208/120V, 3PH, 4W, 100A				EXISTING				LOCATION: BOILER PENTHOUSE				
CIRCUIT DESCRIPTION	POLE	LOAD kVA	BKR.	CONDUIT & WIRE	A	B	C	CONDUIT & WIRE	BKR.	LOAD kVA	POLE	CIRCUIT DESCRIPTION
(E) BOILER ROOM LIGHTS	1	20		EXISTING	1	0.0		2	EXISTING	20	1	EXISTING CIRCUIT
(E) BOILER ROOM RECEPTACLES	1	20		EXISTING	3	0.0		4	EXISTING	20	1	EXISTING CIRCUIT
(E) BAS CONTROL PANEL	1	20		EXISTING	5	0.0	0.0	6	EXISTING	20	1	EXISTING CIRCUIT
(E) BOILER ROOM EXHAUST FAN	1	20		EXISTING	7	0.0		8	EXISTING	20	1	EXISTING CIRCUIT
(E) INLINE PUMP BOILER 1	2	20		EXISTING	9	0.0		10	EXISTING	20	2	(E) INLINE PUMP BOILER 3
					11	0.0	0.0	12				
					13	0.0		14	EXISTING	20	2	(E) INLINE PUMP BOILER 2
					15	0.0		16				
					17	0.0	0.0	18				
					3/4" C-2#12,1#12G			15	0.02	1		BOILER TEKMAR PANEL
				TOTAL (PHASE):				20 % SPARE CAPACITY				
				TOTAL CONN.: 0 kVA				100 % DEMAND FACTOR				
				TOT. CONN. + SPARE: 0 kVA								
				DEMAND: 0.0 kVA								
				DEMAND: 0 AMPS AT 208V								

PANEL TYPE: NEMA 1  
MOUNTING: SURFACE  
MAIN LUGS ONLY TOP FEED  
INTERRUPTING RATING: 10KA SYM.  
FED FROM: FED FROM: PNL V1 1ST FLOOR

NOTES:  
1. PROVIDE NEW CB IN AVAILABLE SPACE. MATCH EXISTING BREAKERS IN STYLE TYPE, SHORT CIRCUIT INTERRUPTING CAPACITY AND MANUFACTURER.

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M&E PROJECT NO:  
4013-2

DRAWING TITLE:  
NEW WORK -  
ROOF PART PLAN

SHEET NUMBER:  
E201

SHEET 2 OF 3

ELECTRICAL PROJECT REQUIREMENTS

GENERAL

- PLAN IS DIAGRAMMATIC AND DO NOT INDICATE EXACT LOCATIONS OF CONDUIT RUNS, EQUIPMENT, APPARATUS, AND DEVICES WHICH SHALL BE DETERMINED IN THE FIELD AS THE WORK PROGRESSES.
WORK REQUIRED BY THE PLAN SHALL BE INSTALLED TO COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC).
EXCEPT AS OTHERWISE NOTED, WIRING SHALL BE RUN IN RACEWAYS.

ORDINANCES, LOCAL CODES, REGULATIONS, AND CERTIFICATES

- WORK REQUIRED BY THE PLANS AND SPECIFICATIONS SHALL BE INSTALLED TO COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), APPLICABLE BUILDING CODES, REGULATIONS, AND ORDINANCES, EXCEPT WHERE THESE REQUIREMENTS ARE EXCEEDED BY THE DRAWINGS AND SPECIFICATIONS IN QUALITY OR QUANTITY.
CHANGES IN THE ARRANGEMENT OF THE WORK, EITHER BEFORE OR AFTER INSTALLATION TO SUIT CONDITIONS IN THE BUILDING OR THE WORK OF OTHER TRADES, AND CHANGES REQUIRED BY AGENCIES HAVING JURISDICTION, SHALL BE WITHOUT EXTRA CHARGE UNLESS CHARGES ARE IN CONSEQUENCE OF CHANGES MADE BY THE OWNER.

SEISMIC REQUIREMENTS

- SEISMIC BRACING OF ELECTRICAL EQUIPMENT, CONDUIT, AND APPARATUS 1. SHALL BE IN CONFORMANCE WITH NUBIC 2018.

BASIC MATERIALS AND METHODS

- ELECTRICAL PLANS ARE DIAGRAMMATIC AND DO NOT INDICATE EXACT LOCATIONS OF CONDUIT RUNS, EQUIPMENT, APPARATUS, AND DEVICES WHICH SHALL BE DETERMINED IN THE FIELD AS THE WORK PROGRESSES. WHERE LOCATIONS SHOWN ON ELECTRICAL DRAWINGS DIFFER FROM LOCATIONS SHOWN ON ARCHITECTURAL DRAWINGS, THE ARCHITECTURAL DRAWINGS SHALL GOVERN.
EXACT LOCATIONS OF EQUIPMENT AND OUTLETS ARE SUBJECT TO THE APPROVAL OF THE OWNER, AND THE OWNER RESERVES THE RIGHT TO MAKE REASONABLE CHANGES WITHOUT COST DURING NORMAL PROGRESS OF THE WORK.
WHERE THREE (3) OR MORE CIRCUIT CONDUCTORS ARE REQUIRED FOR BRANCH CIRCUITING, THE NUMBER OF CONDUCTORS ARE INDICATED. OTHERWISE, TWO (2) CONDUCTORS SHALL BE PROVIDED. PROVIDE GROUND CONDUCTORS IN ADDITION, AS REQUIRED.
XCEPT AS OTHERWISE NOTED, WIRING SHALL BE RUN IN RACEWAYS.
DISTRIBUTE FEEDER AND BRANCH CIRCUIT LOADS OVER PHASES SO THAT PHASE LOADING IS BALANCED TO WITHIN TEN PERCENT (10%) BETWEEN PHASES.

RACEWAYS

- UNLESS OTHERWISE INDICATED, CONDUITS SHALL BE INSTALLED CONCEALED ABOVE CEILING AND WITHIN WALLS AND FLOOR SLABS.
CONCEALED CONDUITS SHALL BE RUN IN A DIRECT LINE WITH LONG SWEEP BENDS AND OFFSETS. EXPOSED RACEWAYS SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO WALLS AND CEILING AND HAVE RIGHT ANGLE TURNS CONSISTING OF EITHER SYMMETRICAL BENDS OR FITTINGS.
BENDS AND OFFSETS SHALL BE AVOIDED WHERE POSSIBLE, BUT WHEN MADE, AN APPROVED CONDUIT BENDING MACHINE OR DEVICE SHALL BE USED. CONDUIT BENDS AND OFFSETS SHALL HAVE LONG SWEEPS AND EASY CURVATURES WITH RADI NOT LESS THAN CORRESPONDING STANDARD ELBOWS AND WITHOUT KINKS OR BUCKLES.
RACEWAYS, WHERE THEY ENTER STEEL BOXES OR STEEL CABINETS, SHALL BE SECURED IN PLACE BY GALVANIZED LOCKNUTS AND BUSHINGS. PROVIDE DOUBLE LOCKNUTS AND INSULATING BUSHINGS ON CONDUITS 1" AND OVER.
CONDUIT RUNS SHALL BE INSTALLED SO AS TO AVOID PROXIMITY TO HOT WATER PIPES. PROVIDE MINIMUM OF 3" CLEARANCE.
RACEWAYS SHALL BE DRY AND CLEAN PRIOR TO INSTALLATION OF CONDUCTORS. ENDS OF CONDUIT RUNS SHALL BE IMMEDIATELY CAPPED AFTER INSTALLATION.
CONDUITS SHALL BE SUPPORTED ON APPROVED TYPES OF WALL BRACKETS, CEILING TRAPEZE, STRAP HANGERS, OR PIPE STRAPS, SECURED BY MEANS OF TOGGLE BOLTS IN HOLLOW MASONRY, RAWL PLUGS IN CONCRETE OR BRICK, MACHINE SCREWS ON METAL SURFACES, AND WOOD SCREWS ON WOOD CONSTRUCTION. NAILS ARE NOT PERMITTED. NO CONDUIT SHALL BE SUPPORTED FROM ANOTHER CONDUIT OR PIPING OR THE MECHANICAL SYSTEM OR EQUIPMENT.
THE TYPE OF RACEWAY SHALL BE AS FOLLOWS FOR FEEDER AND BRANCH CIRCUITS, UNLESS OTHERWISE SPECIFIED:
INSTALLED IN STUD WALLS:
ELECTRICAL METALLIC TUBING
TYPE MC CABLE
INSTALLED IN HUNG CEILING SPACES:
ELECTRICAL METALLIC TUBING
TYPE MC CABLE
INSTALLED EXPOSED (INTERIOR)
INTERMEDIATE METAL
ELECTRICAL METALLIC TUBING
INSTALLED EXPOSED (EXTERIOR)
RIGID STEEL CONDUIT (THREADED)
CONNECTIONS TO MOTORS; TRANSFORMERS; CONTROL DEVICES IN PIPING AND DUCTS, 18" LENGTH MAXIMUM, OR OF SUFFICIENT SHORTER LENGTH LIQUID TIGHT FMC TO PERMIT REMOVAL OF EQUIPMENT OR DEVICE AND ARRANGED TO ELIMINATE TRANSMISSION OF VIBRATION. ALL LOCATIONS: LIQUID TIGHT FLEXIBLE METAL.
RECESSED LIGHTING FIXTURE CONNECTIONS, 6' MAXIMUM LENGTH.
RIGID METAL CONDUIT: HOT DIPPED GALVANIZED, MILD STEEL PIPE, ZINC COATED THREADS WITH AN OUTER COATING OF ZINC BROMATE, AS MANUFACTURED BY TRIANGLE, ALLIED, WHEATLAND, OR APPROVED EQUAL.
ELECTRICAL METALLIC TUBING (EMT): GALVANIZED OR ZINC METALIZED, THREADED, THIN WALL CONDUIT, AS MANUFACTURED BY TRIANGLE, REPUBLIC, WHEATLAND, OR APPROVED EQUAL.
FLEXIBLE METAL CONDUIT: GALVANIZED OR ZINC METALIZED STEEL, SINGLE STRIP INTERLOCKED CONSTRUCTION AS MANUFACTURED BY TRIANGLE, ANACONDA, AMERICAN FLEXIBLE CONDUIT, ELECTRIC-FLEX, OR APPROVED EQUAL.
LIQUID TIGHT FLEXIBLE METAL CONDUIT: GALVANIZED STEEL CORE, SINGLE STRIP INTERLOCKED CONSTRUCTION, WITH INTEGRAL GROUND WIRE, AN EXTRUDED POLYVINYL CHLORIDE COVERING, AS MANUFACTURED BY ANACONDA, TYPE "UA", AMERICAN FLEXIBLE CONDUIT, ELECTRIC-FLEX, OR APPROVED EQUAL.
TYPE MC, TRIANGLE, ANACONDA, AMERICAN FLEXIBLE CONDUIT OR APPROVED EQUAL, 600 VOLT THHN INSULATION, COPPER CONDUCTORS.
CONDUIT FITTINGS
RIGID METAL CONDUIT: INSULATED METALLIC BUSHINGS, THOMAS AND BETTS BIM 50 SERIES, OR APPROVED EQUAL MANUFACTURED BY APPLETON, CROUSE-HINDS, OR O.Z. INSULATED GROUNDING BUSHINGS; THOMAS AND BETTS 3870 SERIES, OR APPROVED EQUAL AS MANUFACTURED BY APPLETON, CROUSE-HINDS, OR O.Z.
ELECTRICAL METALLIC TUBING: INSULATED SET SCREW 1/2" THROUGH 2", THOMAS & BETTS 5031 SERIES COMPRESSION TYPE 2-1/2" THROUGH 4", THOMAS & BETTS 5120 SERIES, OR APPROVED EQUAL MANUFACTURED BY TOMIC OR RACO. DIE CAST FITTINGS NOT PERMITTED.
FLEXIBLE METAL CONDUIT & TYPE MC: INSULATED "TITE-BITE" FITTINGS; THOMAS & BETTS, OR APPROVED EQUAL MANUFACTURED BY STEEL CITY OR RACO.
LIQUID TIGHT FLEXIBLE METAL CONDUIT: INSULATED CONNECTORS WITH "O" RINGS; THOMAS & BETTS 5331 SERIES, 5331GR (FOR EXTERNAL GROUND), 5271 SERIES FOR RIGID CONDUIT TO FLEXIBLE CONNECTION, OR APPROVED EQUAL AS MANUFACTURED BY STEEL CITY OR RACO.
CONDUITS PASSING THROUGH FIRE RATED PARTITIONS, PROVIDE FIRE SEALS O.Z./GEDNEY CFSF OR CFSI SERIES.

WIRE

- CONDUCTORS SHALL BE OF SOFT, ANNEALED, UNCOATED COPPER. CONDUCTORS NO. 10 AWG AND SMALLER TO BE SOLID OR STRANDED. NO. 8 AWG AND LARGER TO BE STRANDED. CONDUCTORS TO HAVE 600 VOLT, 90 DEGREE C DRY LOCATION AND 75 DEGREE C WET LOCATION. INSULATION RATING TO CONFORM TO ASTM STANDARDS. TYPES OF WIRE TO BE UTILIZED ARE AS FOLLOWS:
LIGHTING, RECEPTACLE, AND APPLIANCE BRANCH CIRCUITS (20 AND 30 AMP) TO BE TYPE THWN-THHN, NO. 12 AWG MINIMUM.
POWER WIRING AND FEEDERS TO BE TYPE THHN-THWN SIZES AS INDICATED ON PLANS.
WIRING TO RECESSED FIXTURES AND WITHIN FIXTURE RACEWAYS TO BE TYPE THHN, NO. 12 AWG MINIMUM.
SPECIAL SYSTEM WIRING: REFER TO SPECIFIC DIVISION OF SPECIFICATIONS.
CONDUCTORS SHALL BE CONTINUOUS FROM ORIGIN TO PANEL OR EQUIPMENT WITHOUT SPECIAL WIRE TAP SPICES ARE NECESSARY AND APPROVED. THEY SHALL BE MADE WITH SUITABLE CONNECTORS IN JUNCTION BOXES. TAP SPLICES SHALL BE MADE SECURE WITH APPROVED SOLDERLESS PRESSURE TYPE CONNECTORS AS MANUFACTURED BY BURNDY, OR EQUAL. TAP SPLICES SHALL BE WRAPPED WITH INSULATING PLASTIC TAPE IN A MANNER APPROVED FOR CIRCUIT VOLTAGE. LIGHTING AND RECEPTACLE BRANCH CIRCUIT CONNECTORS SHALL BE MINNESOTA MINING COMPANY, "SKOTCHLOK" PRE-INSULATED CONNECTORS TYPES Y, R, G, AND B, OR APPROVED EQUAL BY T&B AND BURNDY.
MECHANICAL DEVICES USED FOR INSTALLING CONDUCTORS IN RACEWAYS SHALL BE APPROVED FOR THE PURPOSE. WIRE LUBRICANT SHALL BE "U.L." APPROVED.
WIRE AND CABLE SHALL BE MANUFACTURED BY ESSEX, PIRELLI, CABLEC, AMERICAN INSULATED WIRE CORP., TRIANGLE OR APPROVED EQUAL.

WIRING DEVICE AND PLATES

- WIRING DEVICES SHALL BE OF THE SAME MANUFACTURER THROUGHOUT THE PROJECT AND BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
SINGLE POLE SWITCH: HUBBELL HBL1221
THREE WAY SWITCH: HUBBELL HBL1223
DUPLEX RECEPTACLE: HUBBELL HBL5262
ISOLATED GROUND RECEPTACLE: HUBBELL IG5262
GROUND FAULT RECEPTACLE: HUBBELL GF5262
SINGLE-POLE PILOT LIGHT - HUBBELL HBL1221PLG
WIRING DEVICES OF EQUAL QUALITY AS MANUFACTURED BY P&S, ARROW- HART, GENERAL ELECTRIC OR APPROVED EQUAL ARE ACCEPTABLE.
DEVICE PLATES IN FINISHED AREAS SHALL BE SATIN FINISHED STAINLESS STEEL NON-MAGNETIC TYPE 302/304. ACCEPTABLE MANUFACTURER'S OF DEVICE PLATES FOR STANDARD BOXES SHALL BE MULBERRY, BRYANT, HUBBELL, LEVITON, SLATER OR APPROVED EQUAL. AT SURFACE MOUNTED DEVICES IN CAST BOXES USE SHEET STEEL TYPE COVER PLATES, APPLETON FSK SERIES, RACO 800 SERIES, GE OR APPROVED EQUAL.
PLATES FOR SURFACE-MOUNTED DEVICES TO BE STAMPED STEEL, ROUNDED CORNERS. PROVIDE BLANK PLATES ON OUTLET BOXES IN WHICH NO WIRING DEVICE IS INSTALLED.
WEATHERPROOF DEVICE PLATES FOR STANDARD SHEET METAL BOXES SHALL BE DOUBLE SPRING LOADED CAST ALUMINUM LIFT COVERS AS MANUFACTURED BY CROUSE-HINDS #4500, HUBBELL #5205, RACO, OR APPROVED EQUAL. AT "FS" BOXES, PLATES SHALL BE CROUSE-HINDS #4500FS, HUBBELL #5206, RACO, OR APPROVED EQUAL. EQUIP OUTLET BOXES WITH BUSHED COVER PLATES WHERE USED FOR TELEPHONE SYSTEMS OR OTHER SYSTEMS REQUIRING AN EXPOSED CABLE CONNECTION FROM THE BOX, WHERE TWO OR MORE DEVICES ARE INSTALLED AT ONE LOCATION, THEY SHALL BE MOUNTED UNDER A COMMON PLATE.

MOTORS, STARTERS, AND DISCONNECTS

- INSTALL FLEXIBLE LIQUID-TIGHT CONDUIT AT ALL MOTOR CONNECTIONS. ALL MOTOR CIRCUITS SHALL BE EQUIPPED WITH SEPARATE GREEN GROUND WIRE.
DO NOT TERMINATE OR FASTEN RIGID CONDUIT OR EMT TO MOTOR FRAMES, OR BASES. DO NOT USE CONNECTING CONDUITS TO SUPPORT STARTERS AND/OR CONTROL ENCLOSURES.
WIRE MOTORS AND STARTERS SPECIFIED IN MECHANICAL SPECIFICATIONS IN ACCORDANCE WITH COORDINATING WIRING DIAGRAMS AND THESE SPECIFICATIONS.
DO NOT USE FREEHAND FIELD WIRING DIAGRAMS OR SKETCHES.
ELECTRICAL SUBCONTRACTORS SHALL BE RESPONSIBLE FOR THE INSTALLATION OF THE PROPER SIZE THERMAL OVERLOAD, FUSE, AND/OR CIRCUIT BREAKER PROTECTION OF MOTORS (3 OVERLOADS TO BE PROVIDED FOR 3-PHASE EQUIPMENT).
UPON COMPLETION OF CONNECTIONS TO ANY MOTOR, AND WHEN ALL MECHANICAL FEATURES PERMIT, OPERATE SAID MOTOR AND DETERMINE THAT ITS DIRECTION OF ROTATION AND METHOD OF OPERATION ARE CORRECT. COORDINATE AND PERFORM WORK WITH APPROVAL AND ASSISTANCE OF DIVISION 15. TAKE AMMETER READINGS ON ALL MOTOR LEADS TO DETERMINE STARTING CURRENT AND STEADY STATE FULL LOAD OPERATING CURRENT, RECORD THESE READINGS AND DETERMINE THE FOLLOWINGS:
PROPER VALUE OF HEATERS FOR THERMAL OVERLOAD PROTECTION.
PROPER VALUE OF TIME DELAY FUSES TO PROVIDE SAFE MOTOR OPERATION WITHOUT UNNECESSARY BLOWING ON STARTING CURRENTS BUT SIZED AS CLOSE AS POSSIBLE TO THE STEADY STATE RUNNING CURRENT.
SETTING OF ADJUSTABLE INSTANTANEOUS TRIPS ON CIRCUIT BREAKERS TO THE MINIMUM CURRENT VALUE WHICH WILL PERMIT MOTOR STARTING WITHOUT NUISANCE TRIPPING.

MISCELLANEOUS METAL

- PROVIDE SUPPORTS, HANGERS, AND RACKS REQUIRED FOR INSTALLATION OF THE WORK. RACKS AND FITTINGS SHALL BE GALVANIZED AND SHALL BE UNISTRUT OR EQUAL, UNLESS OTHERWISE SPECIFIED.

IDENTIFICATION

- PANEL DIRECTORIES SHALL BE TYPEWRITTEN, INDICATING USE OF EACH ANDWRITTEN DIRECTORIES CIRCUIT AND CLEARLY DESIGNATING SPARE CIRCUITS. H ARE NOT ACCEPTABLE.
NAMEPLATES SHALL BE ENGRAVED "LAMACOID" SHEETS WITH WHITE LETTERS, NOT LESS THAN 3/16" HIGH. COLOR LAMACOID: BLACK OR GRAY, CEMENTED IN PLACE.
TAGS SHALL BE PLACED IN JUNCTION AND PULL BOXES, TERMINAL IN GUTTER SPACES OF PANELS. TAGS SHALL BE FIREPROOF AND SHALL BE SECURELY FASTENED TO CONDUCTORS AND SHALL BE MARKED IN INDELIBLE INK. IN EACH CASE, THE TAGS SHALL BEAR THE CIRCUIT NUMBERS AND PANEL DESIGNATION OF THE WIRE AS INSTALLED.

TESTING

- GENERAL: TO OBTAIN ACCEPTANCE OF THE ELECTRICAL WORK, SHOW IN A JOINT INSPECTION WITH THE OWNER AND ENGINEER, THE FOLLOWING:
THE ELECTRICAL SYSTEMS OF THIS PROJECT ARE COMPLETE AND INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND PERFORM AS INTENDED.
TESTS PERFORMED ON THE SYSTEM INDICATE SATISFACTORY INSULATION RESISTANCE AND FREE OF GROUNDS AND SHORT CIRCUITS.
THAT NECESSARY INSPECTION CERTIFICATES HAVE BEEN OBTAINED.
THAT PHASES OF THE ELECTRICAL SYSTEM HAVE BEEN ENERGIZED AT NORMAL WORKING VOLTAGES AND THAT ELECTRICAL EQUIPMENT COVERED BY THIS CONTRACT HAS FUNCTIONED PROPERLY IN A TEST OF OPERATION.

GROUNDING

- THE ELECTRICAL SYSTEM SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED IN ACCORDANCE WITH CODE REQUIREMENTS. MEASURED RESISTANCE TO GROUND SHALL BE 25 OHMS MAXIMUM.
GROUND CLAMPS AND CONNECTORS SHALL BE APPROVED FOR THE LOCATION USED. CLAMPS AND CONNECTORS TO BE AS MANUFACTURED BY T&B, O.Z./GEDNEY, OR EQUAL.
PROVIDE EQUIPMENT BONDING JUMPERS BETWEEN RACEWAY BONDING BUSHINGS, ENCLOSURES, AND GROUND BUS.
ALL WIRE RACEWAY, CABLE ARMOR, PANEL BOARDS, SWITCHBOARDS, MOTORS AND ANY OTHER NON-CURRENT CARRYING METAL PARTS SHALL BE MECHANICALLY JOINED TO FORM A CONTINUOUS METALLIC PATH AND ASSURE ELECTRICAL CONTINUITY OF THE GROUNDING CIRCUIT.
AN EQUIPMENT GROUNDING CONDUCTOR COMMONLY DESCRIBED AS A SHALL BE PROVIDED FOR FEEDERS AND BRANCH CIRCUITS, PROTECTED BY WIRE OVER-CURRENT DEVICES RATED 20 AMPS AND OVER. ALSO, SUCH GROUNDING CONDUCTORS SHALL BE PROVIDED FOR ALL MOTOR CIRCUITS AND RACEWAYS BURIED IN THE EARTH OR USING FLEXIBLE CONDUIT.

AUTOMATIC TEMPERATURE CONTROLS

- EXISTING ATC SYSTEM IS A HONEYWELL NIAGARA SYSTEM. ALL NEW WORK SHALL BE BASED ON NIAGARA FRAMEWORK. MANUFACTURERS SHALL BE HONEYWELL WEBS, JOHNSON FX, DISTECH OR APPROVED EQUAL.
ALL EXISTING SEQUENCES OF OPERATION SHALL REMAIN UNLESS SPECIFICALLY INDICATED OTHERWISE ON FLOOR PLANS.
THE WORK SHALL INCLUDE PROVIDING ALL DAMPERS, THERMOSTATS, HUMIDISTATS, SENSORS, RELAYS, MICROPROCESSOR CONTROLLERS AND BOARDS, TRANSDUCERS, ENCLOSURES, CONDUIT, WIRING AND OTHER ITEMS NECESSARY TO FULFILL THE INTENT OF THE CONTROL SEQUENCES.
THE WORK ALSO INCLUDES PREPARATION OF SUBMITTALS, COORDINATION WITH OTHER TRADES, PROGRAMMING, START-UP, ADJUSTMENT, TRAINING, FINAL INSPECTION AND SUBMISSION OF AS-BUILT MANUALS.
THE APPROVED MANUFACTURER OF THE MICROPROCESSOR SYSTEM SHALL BE THE MANUFACTURER OF THE EXISTING SYSTEM.
ALL CONTROLS WORK REQUIRED SHALL BE PERFORMED AS PART OF THIS CONTRACT.

QUALITY ASSURANCE

- ALL COMPONENTS SHALL BE U.L. LISTED WHERE APPLICABLE AND COMPLY WITH NEMA STANDARDS.
ALL WIRING SHALL CONFORM TO N.E.C. REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL LICENSING REGULATIONS, UNION JURISDICTIONS, LABOR LAWS, ETC., AND SHALL ENGAGE QUALIFIED AND LICENSED INDIVIDUALS TO PERFORM ALL ASPECTS OF THE WORK.

WORK INVOLVING OTHER TRADES:

- THE SHEET METAL CONTRACTOR SHALL APPROVE OR CORRECT THE SUBMITTED SCHEDULE OF REQUIRED CONTROL DAMPER QUANTITIES AND SIZES BEFORE DAMPERS ARE ORDERED FROM THE FACTORY.
THE SHEET METAL CONTRACTOR SHALL RETURN THE APPROVED DAMPER INQUIRY FORM TO THE CONTROL CONTRACTOR WITHIN A WEEK. SHEET METAL CONTRACTOR SHALL RECEIVE DAMPERS AT THE JOB SITE, SET DAMPER IN PLACE UNDER THE CONTROL CONTRACTOR'S SUPERVISION.
DAMPERS SHALL BE INSTALLED AT A LOCATION WHICH PROVIDES THE REQUIRED SERVICE ACCESS AND ACCESSIBILITY.
THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT AND WIRE FOR ALL POWER REQUIRED FOR EQUIPMENT.
THE CONTROL CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT AND WIRE FOR CONTROL PANELS, ACTUATORS, CONTROLLERS AND OTHER CONTROL DEVICES.

SUBMITTALS

- THE MATERIALS, WORKMANSHIP, DESIGN AND ARRANGEMENT OF ALL WORK INSTALLED UNDER THE CONTRACT SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
THE TEMPERATURE CONTROL CONTRACTOR SHALL SUBMIT SIX COPIES OF A COMPLETE SUBMITTAL PACKAGE FOR THE ENGINEER'S APPROVAL PRIOR TO INSTALLATION OF ANY EQUIPMENT OR PART OF THE SYSTEM. SUBMITTAL PACKAGES SHALL FULLY DESCRIBE THE CONTROL SYSTEM PROPOSED TO BE INSTALLED. PARTIAL SUBMITTALS WILL NOT BE ACCEPTABLE.
A SCHEDULE, PRODUCT DATA, MAINTENANCE DATA, CONTROL DIAGRAMS AND SEQUENCES OF OPERATION AS SPECIFIED HEREIN SHALL BE INCLUDED IN THE SUBMITTAL PACKAGE. ALSO INCLUDE PRINTED COPIES OF PROGRAMS PROPOSED TO BE USED, WHEN REQUESTED.
A SCHEDULE OF ALL DEVICES PROPOSED TO BE USED SHALL BE INCLUDED WITH THE SUBMITTAL PACKAGE. THE SCHEDULE SHALL BE COORDINATED WITH BOTH THE PRODUCT DATA AND THE CONTROL DIAGRAMS. FOR EACH DEVICE, THE SCHEDULE SHALL INDICATE THE CONTROL LABEL, THE MANUFACTURER, THE MODEL NUMBER AND A BRIEF DESCRIPTION OF THE DEVICE'S FUNCTION.

MATERIALS AND EQUIPMENT

- TAMPERPROOF ENCLOSURES SHALL BE PROVIDED FOR ALL SPACE MOUNTED DEVICES.
ENCLOSURES SHALL BE BEKO "SENTINEL" TYPE METAL TAMPERPROOF ENCLOSURE.
LABEL ENCLOSURE WITH CONTROL FUNCTION AND STANDARD LABEL.
PROVIDE TWO (2) SETS OF TAGGED KEYS FOR ALL ENCLOSURES.
SPACE THERMOSTATS SHALL BE BIMETALLIC SINGLE STAGE HEAT-COOL THERMOSTATS WITH INDIVIDUALLY ADJUSTABLE SETPOINTS, HONEYWELL CONTROLS OR APPROVED EQUAL.
SPACE TEMPERATURE SENSORS SHALL BE PLATINUM RTD DEVICES IN WALL MOUNTED ENCLOSURES, COMPATIBLE WITH ELECTRONIC CONTROLLERS.

MANUFACTURER'S DIRECTIONS

- INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH ALL DIRECTIONS AND RECOMMENDATIONS FURNISHED BY THE MANUFACTURER.
WHERE SUCH DIRECTIONS ARE IN CONFLICT WITH THE DRAWINGS AND SPECIFICATIONS, REPORT SUCH CONFLICTS TO THE ENGINEER WHO SHALL RESOLVE THE CONFLICT AS REQUIRED TO MEET THE CONDITIONS OF THE PROJECT.

DRIP PANS

- PROVIDE DRIP PANS FABRICATED FROM CORROSION-RESISTANT SHEET METAL WITH WATERTIGHT JOINTS, AND WITH EDGES TURNED UP 2-1/2". REINFORCE TOP EITHER BY STRUCTURAL ANGLES OR BY ROLLING TOP OVER 1/4" STEEL ROD. PROVIDE HOLD, GASKET, AND FLANGE AT LOW POINT FOR WATER TO RUN TO 1" DRAIN LINE CONNECTION.
LOCATE DRIP PAN UNDER PIPING PASSING OVER OR WITHIN 3' HORIZONTALLY OF ELECTRICAL EQUIPMENT, AND ELSEWHERE AS INDICATED. HANG FROM STRUCTURE WITH RODS AND BUILDING ATTACHMENTS, WELD RODS TO SIDES OF DRIP PAN. BRACE TO PREVENT SAGGING OR SWAYING. CONNECT 1" DRAIN LINE TO CONNECTION AND RUN TO NEAREST PLUMBING DRAIN OR ELSEWHERE AS INDICATED.

TESTING AND START UP

- CONDUCT ALL TESTS AND ADJUSTMENTS OF CONTROLS IMMEDIATELY UPON INSTALLATION.
CONTROLS CONTRACTOR SHALL COMPLETELY TEST THE ENTIRE SYSTEM PRIOR TO FINAL START UP.
ALL FIELD CHANGES REQUIRED FOR PROPER OPERATION SHALL BE MADE PRIOR TO FINAL STARTUP.
FINAL STARTUP SHALL BE CONDUCTED IN PRESENCE OF THE OWNER AND COMMISSIONING AGENT. CONTRACTOR SHALL DEMONSTRATE THAT EQUIPMENT IS CONTROLLED AS SPECIFIED IN THE SEQUENCES OF OPERATION. MICROPROCESSOR CONTROL SHALL BE DEMONSTRATED VIA A REMOTE TERMINAL LOCATED ADJACENT TO THE EQUIPMENT BEING TESTED. TERMINAL SHALL BE CONNECTED TO NEAREST PHONE JACK IN THE BUILDING VIA MODEM. CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT AND WIRING TO ACHIEVE THIS TESTING CONFIGURATION.

AS-BUILT DRAWINGS

- PLASTIC LAMINATES SHALL BE PROVIDED UPON PROJECT COMPLETION, INCORPORATING ANY FIELD CHANGES.
PROVIDE ELECTRONIC COPY OF ALL DRAWINGS, SEQUENCES AND COMPONENTS TO OWNER AT PROJECT COMPLETION

MAINTENANCE AND OPERATING INSTRUCTION

- ALL CONTRACTORS SHALL PROVIDE A MINIMUM OF 4 HOURS FORMAL INSTRUCTION FOR OPERATING PERSONNEL IN THE OPERATION OF THE CONTROL SYSTEM.
AT THE COMPLETION OF THE WORK AND BEFORE THE FINAL PAYMENT IS MADE, THE CONTROLS CONTRACTOR SHALL FURNISH THREE (3) COMPLETE MAINTENANCE AND OPERATING INSTRUCTION MANUALS AND ONE ELECTRONIC COPY. THESE MANUALS ARE TO BE INCORPORATED WITHIN THE OVERALL PROJECT MAINTENANCE AND OPERATING INSTRUCTION MANUALS. EACH MANUAL SHALL CONTAIN THE FOLLOWING:
COMPLETE SUBMITTAL PACKAGE AS APPROVED BY THE ENGINEER WITH FIELD CHANGES NEATLY MARKED UP.
MAINTENANCE INSTRUCTIONS.
MAINTENANCE AND REPLACEMENT PARTS.
OPERATIONS MANUALS WITH OPERATING INSTRUCTIONS FOR ALL EQUIPMENT SUPPLIED.

- MANUFACTURER'S NAMES AND MODEL NUMBERS OF ALL COMPONENTS OF THE SYSTEM.
PRINTOUT OF PROGRAMMING CODE FOR THE BUILDING.

ADJUSTMENTS, SERVICE AND GUARANTEE

- IMMEDIATELY UPON COMPLETION OF THE INSTALLATION, THE CONTROL CONTRACTOR SHALL COMPLETELY ADJUST ALL CONTROL EQUIPMENT, PROGRAM AND TEST ALL EQUIPMENT FOR PROPER SEQUENCE OF OPERATION. THE SYSTEM SHALL BE PLACED IN OPERATION SUBJECT TO THE APPROVAL OF THE ENGINEER. THE CONTROL CONTRACTOR SHALL GUARANTEE THE CONTROL SYSTEM INSTALLED TO BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIAL UNDER NORMAL USE AND SERVICE FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY THE OWNER. ANY DEFECTS IN WORKMANSHIP OR MATERIAL DURING THIS TIME SHALL BE CORRECTED BY THE CONTROL CONTRACTOR AT NO CHARGE TO THE OWNER.

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PROFESSIONAL SEAL:

WILLIAM AMANN
Professional Engineer
LIC. NO. 24GE02943000
THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION UNLESS A PROFESSIONAL'S SEAL AND SIGNATURE ARE ON THE DRAWING

PROJECT TITLE / DESCRIPTION:
NJDOT PROJECT #T0715-01
CHERRY HILL HQ BOILER
PLANT CONTROLLER UPGRADE

FACILITY LOCATION:
NJDOT SOUTH
REGION HEADQUARTERS
CHERRY HILL, NJ

GLC NO.: SERIAL NO.:

DATE: JUNE 6, 2025

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M&E PROJECT NO: 4013-2

DRAWING TITLE: ELECTRICAL SPECIFICATIONS

SHEET NUMBER: E601

SHEET 3 OF 3