

ELECTRICAL SPECIFICATIONS

SCOPE – WORK SHALL CONSIST OF FURNISHING OF ALL LABOR, MATERIALS AND SERVICES REQUIRED, COMPLETE AND READY FOR PROPER OPERATION, FOR THE INSTALLATION OF ALL ELECTRICAL WORK CALLED FOR BY THE ACCOMPANYING DRAWINGS AND SPECIFICATIONS.

BEFORE SUBMITTING HIS BID, THE CONTRACTOR SHALL VISIT AND FIELD SURVEY THE SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH HIS WORK WILL BE INSTALLED. THIS CONTRACT INCLUDES ALL NECESSARY TRANSITIONS AND MODIFICATIONS REQUIRED TO INSTALL NEW EQUIPMENT IN NEW AND EXISTING SPACES. ALL SYSTEMS AND EQUIPMENT SHALL BE FULLY OPERATIONAL UNDER THIS CONTRACT BEFORE THE JOB IS CONSIDERED COMPLETE.

CODES, REGULATIONS AND STANDARDS – ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT CODES IN EFFECT:

2011 NATIONAL ELECTRICAL CODE  
2005 CONNECTICUT STATE BUILDING CODE WITH 2013 AMENDMENTS  
2005 CONNECTICUT STATE FIRE SAFETY CODE WITH 2009 AMENDMENTS  
ANY AND ALL LOCAL, STATE AND FEDERAL AUTHORITIES HAVING JURISDICTION OVER WORK

PERMITS, FEES AND INSPECTIONS – THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS, PAY ALL GOVERNMENT AND STATE SALES TAXES AND FEES APPLICABLE. HE SHALL COMPLETE ALL DOCUMENTS, FILE ALL DRAWINGS, OBTAIN ALL NECESSARY APPROVALS FROM THE PROPER AUTHORITY HAVING JURISDICTION AND OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION COVERING HIS WORK.

GUARANTEES – ALL WORKMANSHIP AND MATERIALS SHALL BE FULLY GUARANTEED FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF ENTIRE INSTALLATION COVERED BY THIS CONTRACT. SHOULD ANY DEFECTS OCCUR DURING THIS TIME PERIOD, THE CONTRACTOR SHALL REPAIR AND/OR REPLACE ALL DEFECTIVE EQUIPMENT, MATERIALS AND/OR WORK AT NO EXTRA CHARGE.

SHOP DRAWINGS – SUBMIT FOUR (4) COPIES FOR REVIEW, DETAILED SHOP DRAWINGS OF ALL EQUIPMENT AND MATERIALS SPECIFIED. NO MATERIAL OR EQUIPMENT MAY BE DELIVERED TO THE JOB SITE OR INSTALLED UNTIL THE CONTRACTOR HAS RECEIVED APPROVED SHOP DRAWINGS FOR THE PARTICULAR MATERIAL OR EQUIPMENT. SHOP DRAWINGS SHALL BE SPECIFIC, WITH ITEMS SUBMITTED FOR APPROVAL CLEARLY IDENTIFIED. CONTRACTOR SHALL REVIEW AND APPROVE ALL SHOP DRAWINGS PRIOR TO SUBMITTING TO THE ENGINEER.

MANUFACTURER'S INSTRUCTIONS – INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND REQUIREMENTS FOR PROPER OPERATION AND MAINTENANCE.

PROPERTY AND EQUIPMENT PROTECTION – CONTRACTOR SHALL TAKE ALL MEANS NECESSARY AND/OR REQUIRED TO PROTECT OWNER'S PROPERTY WITHIN WORKING AREAS FROM DUST, DEBRIS AND PHYSICAL DAMAGE GENERATED BY HIS WORK. PROPERLY AND COMPLETELY PROTECT ALL EQUIPMENT INCLUDED IN THIS CONTRACT AGAINST DAMAGE, ETC. AS CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO EQUIPMENT FURNISHED BY HIM UNTIL FINAL ACCEPTANCE.

CUTTING, PATCHING AND REPAIRING – ELECTRICAL CONTRACTOR SHALL PERFORM ALL CUTTING FOR ALL ELECTRICAL ITEMS AND EQUIPMENT CALLED FOR UNDER THIS CONTRACT. THE GENERAL CONTRACTOR SHALL PERFORM ALL PATCHING AND REPAIRING OF ALL SURFACES.

REMOVALS – THE CONTRACTOR SHALL DISCONNECT AND REMOVE ALL ELECTRICAL WORK AS SHOWN AND NOTED ON DRAWINGS, AND ALL EQUIPMENT AND ELECTRICAL WORK NOT BEING USED. ALL DEVICES WHICH ARE NO LONGER REQUIRED TO FUNCTION SHALL BE DE-ENERGIZED, DISCONNECTED AND REMOVED BACK TO THE SOURCE. DISCONNECT AND COMPLETELY REMOVE ALL UNUSED CONDUIT, WIRING, BOXES, SUPPORTS, ETC. ALL NEW EQUIPMENT AND SYSTEMS SHALL BE FULLY OPERATIONAL BEFORE THE JOB IS CONSIDERED COMPLETE.

CLEAN UP – CONTRACTOR SHALL TAKE CARE TO AVOID ACCUMULATION OF BOXES AND DEBRIS RESULTING FROM THE INSTALLATION OF HIS WORK. CONTRACTOR SHALL REMOVE ALL DEBRIS FROM THE PREMISES EACH DAY AND KEEP THE WORK AREA CLEAN.

TEMPORARY LIGHT AND POWER – FURNISH AND INSTALL TEMPORARY ELECTRICAL SERVICE FOR USE BY ALL TRADES DURING THE COURSE OF CONSTRUCTION. TEMPORARY WORK SHALL BE IN COMPLIANCE WITH ALL APPLICABLE ARTICLES IN THE NEC, OSHA AND WITH ALL REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION. TEMPORARY POWER SHALL BE MAINTAINED PER NEC ARTICLE 590.

RECORD DRAWINGS – MAINTAIN A SET OF ELECTRICAL DRAWINGS AT THE SITE INDICATING ACTUAL DEVICE LOCATIONS AND CONDUIT ROUTINGS ON THE PROJECT. CLEARLY MARK ALL ITEMS IN RED ON THE DRAWINGS. AT THE COMPLETION OF THE PROJECT, PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS CLEARLY SHOWING ALL LOCATIONS AND TURN OVER TO OWNER.

MATERIALS AND WORKMANSHIP – ALL MATERIALS REQUIRED FOR THE WORK SHALL BE NEW, OF FIRST-CLASS QUALITY AND BEAR THE UL LABEL. MATERIALS SHALL BE FURNISHED, DELIVERED, INSTALLED, CONNECTED AND FINISHED IN EVERY DETAIL AS TO FIT PROPERLY INTO NEW AND EXISTING SPACES. WHERE NO SPECIFIC KIND OR QUALITY OF MATERIAL IS GIVEN, A FIRST-CLASS STANDARD ARTICLE SHALL BE FURNISHED. ALL WORK SHALL BE OF A QUALITY CONSISTENT WITH GOOD TRADE PRACTICE AND SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.

CONDUCTORS – CONDUCTORS FOR BUILDING WIRE SHALL BE UL LISTED, 600 VOLT, 75°C, SINGLE CONDUCTOR TYPE THWN/THHN, 98% CONDUCTIVITY ANNEALED UNCOATED COPPER WITH PVC INSULATION COATED WITH GALVANIZED PROTECTIVE COATING. CONDUIT FITTINGS SHALL BE MALLEABLE IRON, CADMIUM PLATED WITH FULL THREADED HUBS. MANUFACTURED BY ALLIED TUBE AND CONDUIT OR EQUAL.

ELECTRICAL METALLIC TUBING (EMT) – ELECTRICAL METALLIC TUBING SHALL BE GALVANIZED THIN WALL STEEL CONDUIT. CONNECTORS AND COUPLINGS SHALL BE HEAVY DUTY, ZINC PLATED STEEL, SET SCREW TYPE. CONDUIT BODIES SHALL BE CAST ALUMINUM WITH ALUMINUM COVER AND SET SCREW HUBS. CONDUIT STRAPS SHALL BE SNAP-TYPE, DOUBLE RIBBED ZINC PLATED STEEL. MANUFACTURED BY ALLIED TUBE AND CONDUIT OR EQUAL.

FLEXIBLE METALLIC CONDUIT (FMC) – FLEXIBLE METALLIC CONDUIT SHALL BE GALVANIZED HEAVY SHEET METAL STRIP IN INTERLOCKED CONSTRUCTION. LIQUID-TIGHT FLEXIBLE CONDUIT SHALL BE GALVANIZED HEAVY SHEET METAL STRIP, SPIRALLY-WOUND INTERLOCKED CONSTRUCTION WITH AN EXTRUDED POLYVINYL GRAY JACKET. CONNECTORS SHALL BE UL LISTED AND LABELED FOR APPLICATION AND IN ENVIRONMENT INSTALLED. MANUFACTURED BY O/Z GEDNEY OR ELECTRI-FLEX.

RIGID POLYVINYL CHLORIDE CONDUIT (PVC) – RIGID POLYVINYL CHLORIDE CONDUIT SHALL BE SCHEDULE 40, 90°C, UL LISTED. ALL PVC CONDUIT AND FITTINGS SHALL BE SOLVENT WELDED. MANUFACTURED BY CARLON OR EQUAL.

OUTLET BOXES – OUTLET BOXES SHALL BE SURFACE MOUNTED NON-METALLIC, OF PROPER TYPE AND SIZE AS REQUIRED BY NUMBER OF DEVICES, NUMBER OF CONDUCTORS AND WIRING METHOD UTILIZED. BOXES SHALL BE SECURED FIRMLY TO BUILDING STRUCTURE AND SET TRUE AND SQUARE, AND SHALL BE ATTACHED SUCH THAT THEY WILL NOT ROCK, SHIFT OR MOVE WHEN DEVICES ARE USED. MANUFACTURED BY RACO OR EQUAL.

JUNCTION BOXES AND PULLBOXES – JUNCTION BOXES AND PULLBOXES SHALL BE OF PROPER SIZE AND TYPE AS REQUIRED. NON-METALLIC CONSTRUCTION WITH KNOCKOUTS AND THREADED HUBS TO RECEIVE THE COVERS. COVERS SHALL BE FLAT, GASKETED AND FASTENED TO THE BOX WITH MACHINE SCREWS.

SAFETY DISCONNECT SWITCHES – SAFETY DISCONNECT SWITCHES SHALL BE HEAVY-DUTY TYPE, FUSED OR NON-FUSED, MOTOR RATED, INTERLOCKING COVER WITH APPROPRIATE VOLTAGE AND CURRENT RATINGS. QUICK-MAKE, QUICK-BREAK MECHANISMS, UL LISTED METAL ENCLOSURES TO SUIT LOCATION AND INSTALLATION. MANUFACTURED BY SIEMENS OR EQUAL..

BACKBOARDS – BACKBOARDS SHALL BE FIRE RETARDANT, HICKSON CO. (DRI-CON, 3/4 INCH TYPE AC PLYWOOD OF SUFFICIENT SIZE FOR MOUNTING OF SPECIFIED EQUIPMENT. PAINT BOTH SIDES WITH TWO COATS OF FIRE-RESISTANT GRAY ENAMEL PAINT.

WIRING DEVICES – WIRING DEVICES SHALL BE UL LISTED, SPECIFICATION GRADE, SELF-GROUNDING, GROUND LUG, BACK & SIDE WIRED. MANUFACTURED BY HUBBELL OR EQUAL. BROWN COLOR.

SWITCHES: 20A @ 120/277V

SINGLE POLE TOGGLE SWITCH .....HBL1221

RECEPTACLES: 20A @ 125V

DUPLEX RECEPTACLE .....HBL5362  
DUPLEX RECEPTACLE – GFI.....GFS352

SWITCH AND RECEPTACLE WALL PLATES SHALL BE OF SAME MATERIAL AS BACKBOX.

LIGHTING FIXTURES – FURNISH AND INSTALL ALL LIGHTING FIXTURES AS SHOWN ON PLANS AND SCHEDULES, COMPLETE WITH REQUIRED ACCESSORIES AND MOUNTING HARDWARE. PROVIDE LAMPS FOR ALL FIXTURES OF WATTAGES AND TYPES INDICATED. CLEAN AND REMOVE ALL PAINT, STICKERS, DIRT, SMUDGES AND FINGERPRINTS FROM FIXTURES AFTER FINAL CLEAN-UP.

PANELBOARDS – PANELBOARD SHALL BE CIRCUIT BREAKER TYPE, THREE PHASE, FOUR WIRE WITH THE NUMBER OF BRANCH CIRCUITS AS INDICATED ON DRAWINGS. GROUND BUS AND LUGS, NEUTRAL BUS. UL LISTED WITH DIRECTORY CARD HOLDER MOUNTED TO INSIDE FRONT DOOR. BRANCH CIRCUIT BREAKERS SHALL BE BOLT-ON, QUICK-MAKE, QUICK-BREAK THERMAL-MAGNETIC TYPE WITH VISIBLE TRIP POSITION, MULTI-POLE BREAKERS EQUIPPED WITH HANDLE TIES. SEE PANEL SCHEDULE FOR CIRCUIT BREAKER SIZES, TYPES AND SHORT CIRCUIT CURRENT RATINGS (SCCR). MANUFACTURED BY SIEMENS OR EQUAL.

GROUND RODS – GROUND RODS SHALL BE HIGH STRENGTH STEEL CORE WITH ELECTROLYTICALLY BONDED COPPER JACKET, AND SHALL CONFORM TO REQUIREMENTS OF THE UL SPEC. NO. 467 (ANSI C-33.8-1972). MINIMUM SIZE SHALL BE 5/8 INCH DIAMETER BY EIGHT (8) FT. LENGTH. MANUFACTURED BY BLACKBURN PRODUCTS, KNIGHT METALCRAFT OR GALVIN.

FUSES – FUSES SHALL BE CARTRIDGE TYPE, RATED 250 VOLTS. BUSSMAN LOW-PEAK, DUAL-ELEMENT, TIME-DELAY, CLASS RK1.

INSTALLATION – ALL WORK, MATERIALS AND MANNER OF INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2011 NATIONAL ELECTRICAL CODE AND ALL APPLICABLE CODES.

PROVIDE WIRING TO ALL OUTLETS, EQUIPMENT APPARATUS AND OTHER SPECIALTIES UNDER THIS DIVISION THAT WHICH IS FURNISHED OR PROVIDED UNDER OTHER DIVISIONS OR BY OWNER. THE TERM "WIRING" SHALL BE CONSIDERED TO BE COMPRISED OF THE CONDUIT, CONDUCTORS, AND CONNECTIONS, COMPLETE AND READY FOR PROPER OPERATION.

ALL WIRING ON DRAWINGS IS SIZED FOR TYPE THWN/THHN COPPER CONDUCTORS. MINIMUM SIZE CONDUIT SHALL BE 3/4", MINIMUM CONDUCTOR SIZE #12 AWG. ALL CONDUIT AND WIRING SHALL BE INSTALLED CONCEALED IN FINISHED AREAS.

FURNISH AND INSTALL APPROVED TYPE PULL BOXES AS REQUIRED. ALL RACEWAYS AND BOXES SHALL BE MECHANICALLY JOINED TO FORM A CONTINUOUS ELECTRICAL CONDUCTOR. FURNISH LOCKNUTS AND BUSHINGS FOR ALL TERMINATIONS IN BOXES AND ENCLOSURES.

RIGID POLYVINYL CHLORIDE CONDUIT (PVC) SHALL BE USED IN PUMP STATION FOR NEW LIGHTING AND RECEPTACLE BRANCH CIRCUIT WIRING AND COMMUNICATIONS CONDUITS.

RIGID STEEL CONDUIT (RGS) SHALL BE USED FOR WIRING WHERE EXPOSED TO MECHANICAL DAMAGE.

ELECTRICAL METALLIC TUBING (EMT) SHALL BE USED ONLY IN DRY LOCATIONS IN FIRE PUMP HOUSE FOR NEW POWER BRANCH CIRCUIT WIRING. EMT SHALL NOT BE USED IN OR BELOW CONCRETE SLABS, OR WHERE EXPOSED TO MECHANICAL DAMAGE.

FLEXIBLE METALLIC CONDUIT (FMC) SHALL BE USED FOR FINAL CONNECTION OF MOTORS AND EQUIPMENT. LENGTH OF FLEXIBLE CONNECTION SHALL BE KEPT AT A MINIMUM, NOT TO EXCEED FOUR (4) FEET.

CONDUCTOR WITHIN PANELBOARDS, PULL BOXES AND OTHER EQUIPMENT WHERE CONCENTRATIONS OF CONDUCTORS ARE ENCLOSED, SHALL BE NEATLY ARRANGED AND TIED WITH CABLE TIES. CIRCUITS SHALL BE CONNECTED TO THE PANELS SO THAT THE TOTAL LOAD IS DISTRIBUTED AS EVENLY AS POSSIBLE, EQUALLY BETWEEN EACH LINE AND NEUTRAL. BALANCE ALL PANELS TO +/- 10%.

CONDUCTOR IDENTIFICATION – CONDUCTORS #6 AWG AND SMALLER SHALL HAVE COLOR-CODED INSULATION. CONDUCTORS #4 AWG AND LARGER SHALL BE IDENTIFIED WITH TAPES APPLIED NEAR THE ENDS OF CONDUCTORS. FEEDERS AND BRANCH CIRCUIT CONDUCTORS SHALL BE IDENTIFIED FOR PHASE ROTATION:

	120/208V-3PH	277/480V-3PH
PHASE A	BLACK	BROWN
PHASE B	RED	ORANGE
PHASE C	BLUE	YELLOW
NEUTRAL	WHITE	WHITE
GROUND	GREEN	GREEN

IDENTIFICATION – FURNISH AND INSTALL NAMEPLATES FOR ALL PANELS, MOTOR STARTERS AND SAFETY DISCONNECT SWITCHES, IDENTIFYING ITEMS BY NAME AND CIRCUIT FED FROM.

IDENTIFYING NAMEPLATES SHALL BE LAMINATED, PLASTIC TYPE, CONSISTING OF TWO BLACK PLASTIC SHEETS WITH ONE WHITE PLASTIC SHEET BONDED TO AND BETWEEN THE TWO OUTER BLACK SHEETS AND HAVING THE LETTERS ENGRAVED IN ONE BLACK TO THE DEPTH OF THE WHITE PLASTIC. FASTEN NAMEPLATES TO EQUIPMENT WITH SUITABLE ADHESIVES.

ALL NEW AND MODIFIED PANELS SHALL HAVE TYPEWRITTEN CIRCUIT DIRECTORIES IDENTIFYING ALL BRANCH CIRCUITS, SPARES AND SPACES.

GROUNDING – ALL ELECTRICAL WORK SHALL BE GROUNDING AND BONDED IN CONFORMANCE WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE AND LOCAL REQUIREMENTS. ALL ELECTRICAL EQUIPMENT SHALL BE MADE TO FORM A CONTINUOUS CONDUCTING, GROUND PATH OF LOW IMPEDANCE FOR OPERATION OF CIRCUIT PROTECTIVE DEVICES. PROVIDE GREEN INSULATED GROUNDING CONDUCTOR IN ALL RACEWAYS.

SPlicing – SPlicing SHALL BE DONE WITH INSULATED OR NON-INSULATED CONNECTORS OF APPROPRIATE TYPES AND CURRENT-CARRYING CAPACITY. NON-INSULATED CONNECTORS SHALL BE WRAPPED WITH INSULATING TAPE TO THICKNESS OF INSULATION OF SPICED CONDUCTORS. TAPE SHALL BE 3M OR SUPER 88 SCOTCH FLAME-RETARDANT, COLD AND WEATHER RESISTANT.

ELECTRICAL SYMBOLS

☒ – SURFACE MOUNTED VAPORTIGHT LED LUMINAIRE. LED, 700 LUMENS, 5000K. DIE-CAST ALUMINUM HOUSING. SORE-IN GLASS LENS, CAST ALUMINUM GUARD. ELECTRONIC DRIVER, 120V. SIMKAR #VAPLED-C-1150U1 OR EQUAL.

S – SINGLE POLE TOGGLE SWITCH, 20A @ 120/277V, 48" AFF

Ⓜ<sup>G</sup> – DUPLEX RECEPTACLE – GFCI, 20A @ 125V, 48" AFF UON

→PSR – HOMERUN TO PANEL, LETTERS/NUMBERS INDICATE PANEL TERMINATION

— — — — — CONDUIT AND WIRE, CROSS LINES INDICATE NUMBER OF CONDUCTORS. INSULATED GROUND REQUIRED BUT NOT SHOWN.

— — — — — EQUIPMENT CONNECTION

■ – NEW PANELBOARD, 277/480V-3ø

■ – NEW POWER CENTER, 120/208V-3ø

□ – DISCONNECT SWITCH – NEMA 1 ENCLOSURE

▮ – DISCONNECT SWITCH – NEMA 3R ENCLOSURE

ⓐ – JUNCTION BOX

——— PLYWOOD EQUIPMENT BACKBOARD

Ⓜ – MOTOR

Ⓣ – REVERSE-ACTING THERMOSTAT

ELECTRICAL REMOVALS PLAN

1/2" = 1'-0"

(A) EXISTING LIGHTING FIXTURE AND ASSOCIATED CONDUIT AND WIRING TO BE DISCONNECTED AND REMOVED.

(B) EXISTING TOGGLE SWITCH AND ASSOCIATED CONDUIT AND WIRING TO BE DISCONNECTED AND REMOVED.

(C) EXISTING JUNCTION BOX TO BE DISCONNECTED AND REMOVED. EXISTING 2 – 3" CONDUITS TO REMAIN AND TO BE REUSED.

(D) EXISTING EQUIPMENT BACKBOARD, SAFETY DISCONNECT SWITCHES, MOTOR CONTROLS, RECEPTACLES AND ASSOCIATED CONDUIT AND WIRING TO BE DISCONNECTED AND REMOVED.

(E) EXISTING ELECTRIC HEATER AND ASSOCIATED CONDUIT AND WIRING TO BE DISCONNECTED AND REMOVED.

(F) EXISTING PLATFORM MOUNTED AIR COMPRESSOR TO BE DISCONNECTED AND ASSOCIATED CONDUIT AND WIRING TO BE REMOVED.

(G) EXISTING PUMPS TO BE DISCONNECTED AND ASSOCIATED CONDUIT AND WIRING REMOVED.

(H) EXISTING MOTOR STARTERS AND ASSOCIATED CONDUIT AND WIRING TO BE DISCONNECTED AND REMOVED.

(J) EXISTING DISCONNECT SWITCH AND ASSOCIATED CONDUIT AND WIRING TO BE DISCONNECTED AND REMOVED.

(K) EXISTING CONTROL PANEL AND ASSOCIATED CONDUIT AND WIRING TO BE DISCONNECTED AND REMOVED.

(L) ALL EXISTING CONDUIT, WIRING, BOXES, SUPPORTS, ETC. TO BE DISCONNECTED AND COMPLETELY REMOVED UNLESS NOTED OTHERWISE TO REMAIN.

(M) EXISTING SECTION OF GROUNDING GRID TO BE REMOVED FOR NEW STAIR CONSTRUCTION. EXTEND EXISTING GRID AND CONNECT LOOP AROUND NEW STAIRWAY, SEE ELECTRICAL PLAN.

(N) EXISTING COMMUNICATIONS JUNCTION BOX TO BE REMOVED, RELOCATE EXISTING UNDERGROUND COMMUNICATIONS CONDUIT, SEE ELECTRICAL FLOOR PLAN.

LEGEND

A AMPERE

ADA AMERICANS WITH DISABILITIES ACT

AFF ABOVE FINISHED FLOOR

AFG ABOVE FINISHED GRADE

AWG AMERICAN WIRE GAUGE

C CONDUIT

CB CIRCUIT BREAKER

EUH ELECTRIC UNIT HEATER

G, GFCI GROUND FAULT CIRCUIT INTERRUPTER

GND GROUND

HP HORSEPOWER

KVA KILOVOLT-AMPERE

KW KILOWATT

MCB MAIN CIRCUIT BREAKER

MLO MAIN LUGS ONLY

MOCP MAXIMUM OVERCURRENT PROTECTION

N NEUTRAL

NEC NATIONAL ELECTRICAL CODE

NFPA NATIONAL FIRE PROTECTION ASSOCIATION

NTS NOT TO SCALE

OC ON CENTER

P POLE

PH, ø PHASE

SQ SQUARE

UL UNDERWRITERS LABORATORIES

UON UNLESS OTHERWISE NOTED

V VOLT

VA VOLT-AMPERE

W WATT

WP WEATHERPROOF

GENERAL NOTES

1. FURNISH LABOR, MATERIALS, EQUIPMENT AND SERVICE NECESSARY FOR THE PROPER AND COMPLETE INSTALLATION OF ALL ELECTRIC WORK AS SPECIFIED AND SHOWN ON DRAWINGS.

2. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. EXACT LOCATIONS OF ALL EQUIPMENT AND DEVICES SHALL BE COORDINATED WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN OF ELECTRICAL EQUIPMENT AND DEVICES.

3. ALL ELECTRICAL EQUIPMENT SHALL BE READILY ACCESSIBLE AND HAVE A CLEAN AND DRY LOCATION. PROVIDE CLEAR WORKING SPACE AROUND EQUIPMENT IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE.

4. CONDUIT RUNS ARE SHOWN SCHEMATICALLY, BUILDING CONDITIONS WILL DETERMINE ACTUAL CONDUIT ROUTINGS. ALL CONDUIT SHALL BE INSTALLED PARALLEL AND PERPENDICULAR TO BUILDING LINES.

5. ALL ITEMS SHALL BE NEW, UL LISTED AND LABELED.

6. MOUNTING HEIGHTS SHALL BE FROM FINISHED FLOOR TO CENTER LINE OF DEVICE UNLESS OTHERWISE NOTED.

7. ALL CEILING MOUNTED ELECTRICAL DEVICES SHALL BE SUPPORTED DIRECTLY FROM BUILDING STRUCTURE, PROVIDE AUXILIARY MOUNTING BRACKETS AS REQUIRED.

8. THE ELECTRICAL CONTRACTOR SHALL COORDINATE HIS WORK SO IT DOES NOT INTERFERE WITH THE WORK OF OTHER TRADES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT HIS WORK IS INSTALLED IN A TIMELY MANNER.

9. VERIFY LOCATION OF CONNECTION BOX WITH MANUFACTURER FOR MECHANICAL EQUIPMENT BEFORE ROUGH-IN. ELECTRICAL CONTRACTOR SHALL OBTAIN ALL INFORMATION REQUIRED FROM MANUFACTURER TO WIRE EQUIPMENT FOR PROPER OPERATION OF MOTORS AND SYSTEMS AS SO INTENDED.

10. ALL ELECTRICAL WORK TO BE INSPECTED PRIOR TO BEING ENERGIZED.

ELECTRICAL REMOVALS AND SPECIFICATIONS

PREPARED FOR

TOWN OF BROOKFIELD

BROOKFIELD HIGH SCHOOL

Brookfield, Connecticut

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Rev. Date

By

Revision

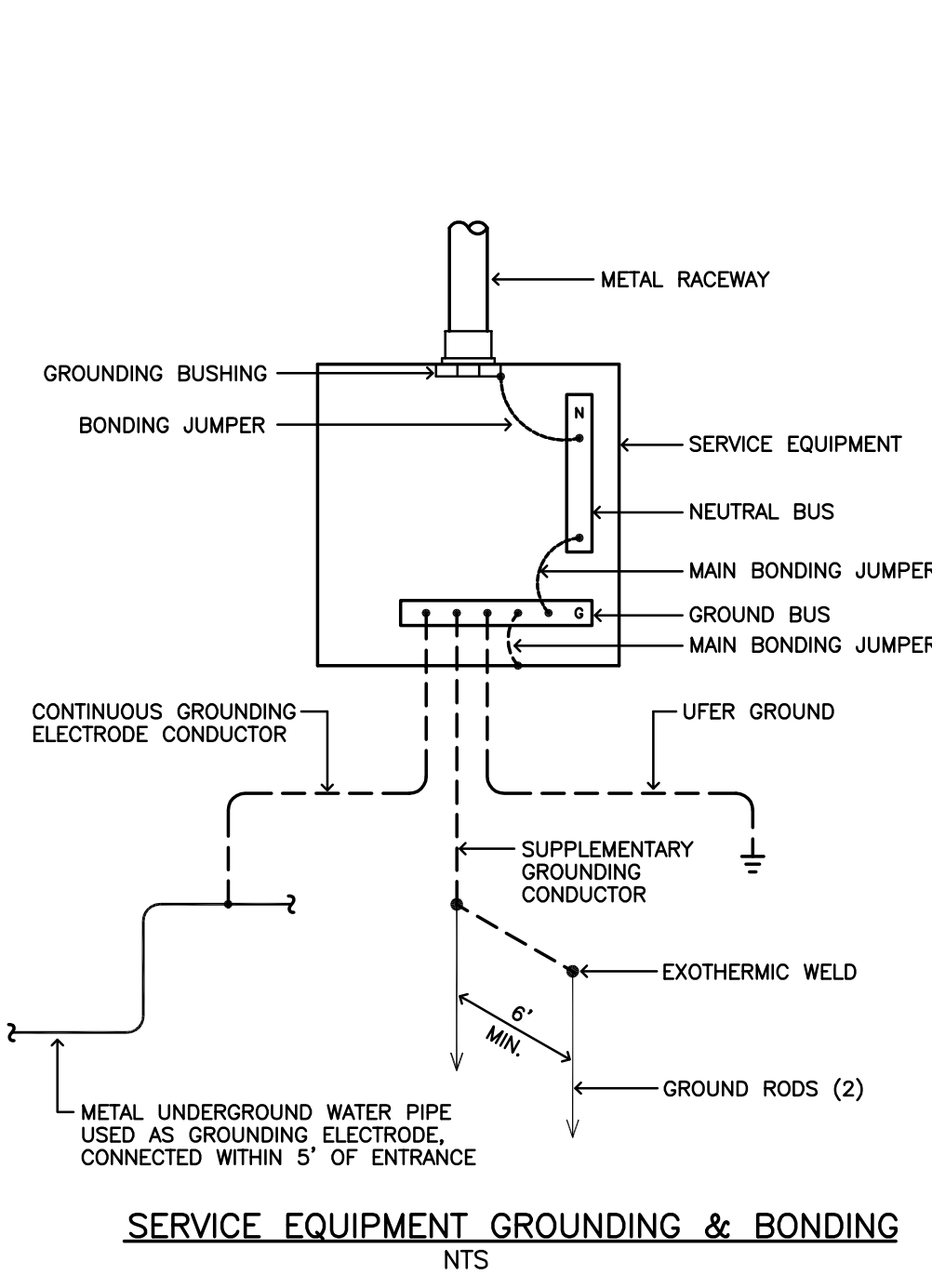
ELECTRICAL DRAWING LIST

E-1	ELECTRICAL REMOVALS AND SPECIFICATIONS
E-2	ELECTRICAL PLAN AND RISER DIAGRAM

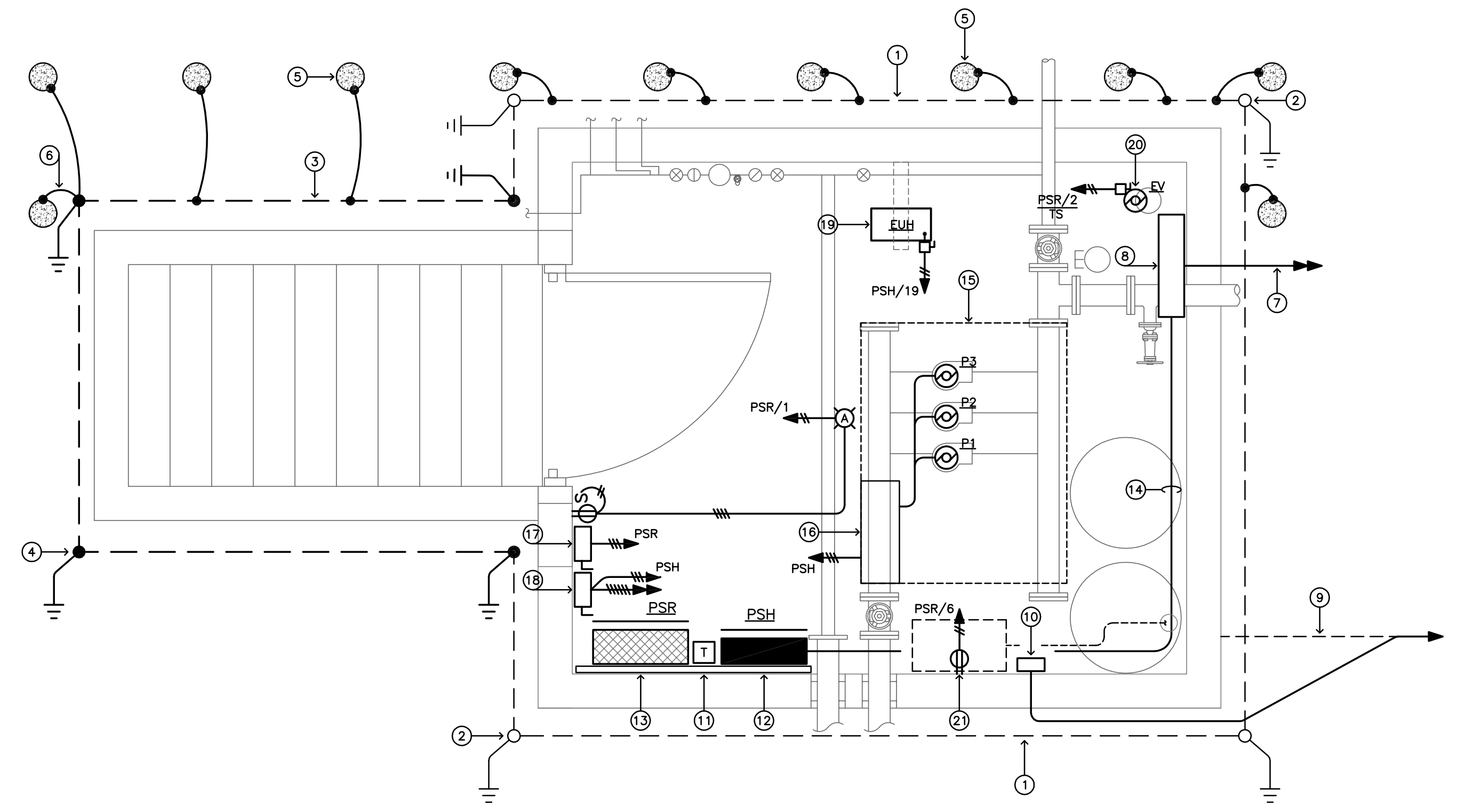
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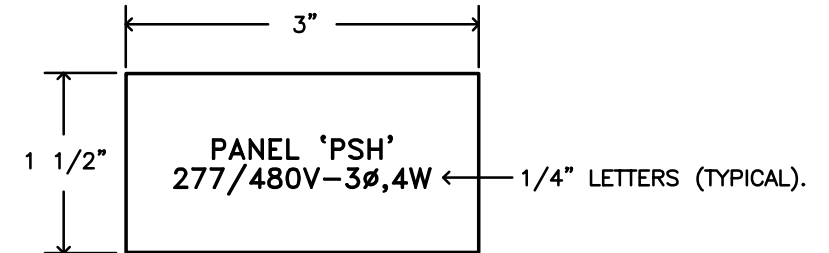


SERVICE EQUIPMENT GROUNDING & BONDING  
NTS



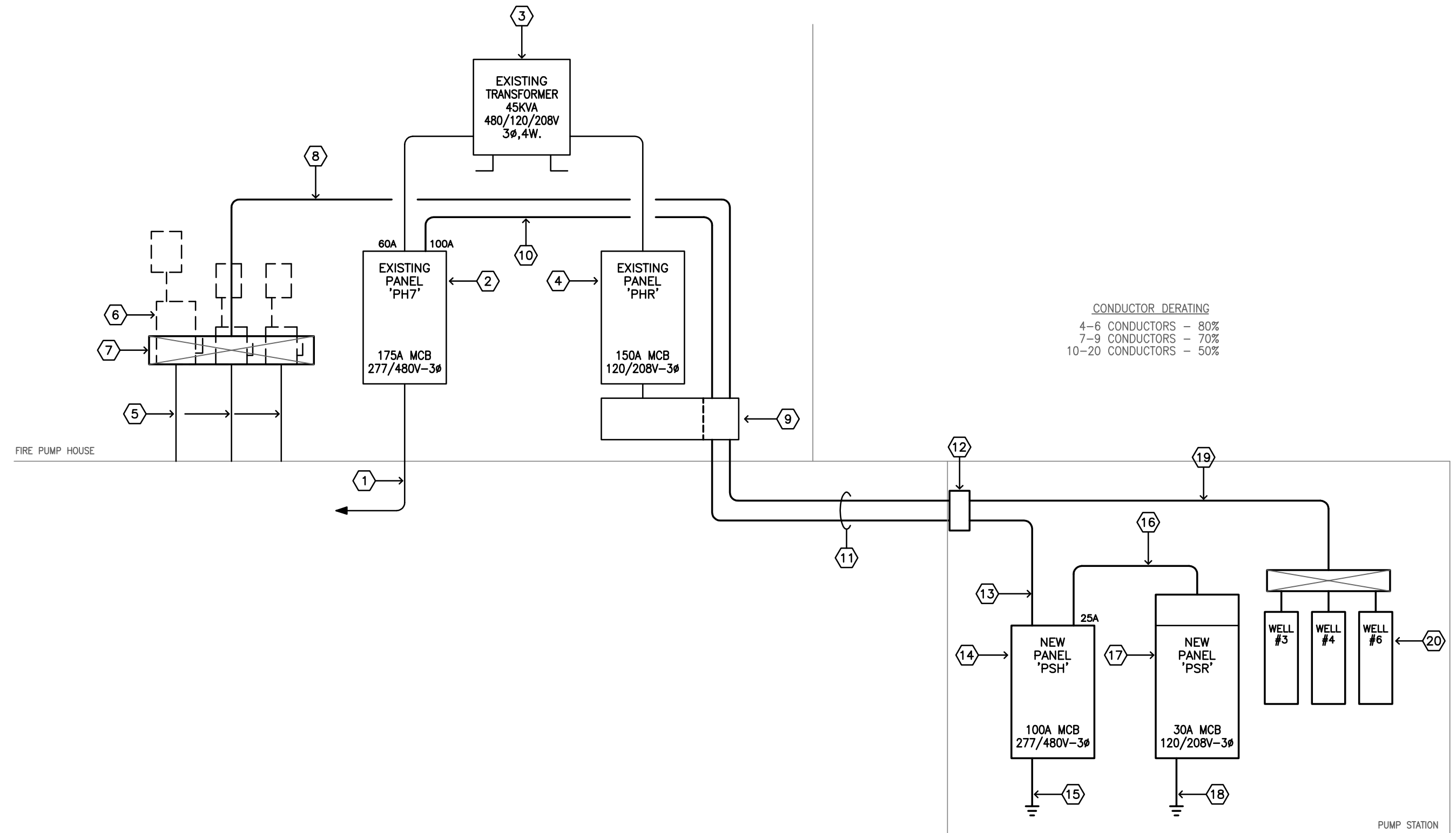
ELECTRICAL FLOOR PLAN  
1/2" = 1'-0"

- LEGEND — ELECTRICAL FLOOR PLAN**
- EXISTING #4/0 BARE STRANDED Cu GROUND GRID TO REMAIN, "TYPICAL".
  - EXISTING GROUND ROD FOR GROUNDING GRID TO REMAIN, "TYPICAL".
  - 4/0 BARE STRANDED Cu GROUND GRID, CONNECT TO EXISTING GROUND GRID TO FORM ONE CONTINUOUS GROUNDING LOOP, "TYPICAL".
  - NEW 3/4" DIA. x 10L COPPER CLAD GROUND ROD, "TYPICAL". PROVIDE EXOTHERMIC WELDED CONNECTION TO GROUNDING GRID.
  - NEW CONCRETE FILLED STEEL PROTECTIVE BOLLARD, "TYPICAL".
  - BOND PROTECTIVE BOLLARD TO GROUNDING GRID, "TYPICAL". BOND NEW BILCO ENTRY DOORS AND NEW ACCESS HATCH (NOT SHOWN) TO EXISTING GROUNDING GRID.
  - EXISTING 2 - 3" UNDERGROUND PVC CONDUITS TO BE REUSED, ONE (1) FOR NEW PANEL FEEDER AND ONE (1) FOR WELL PUMP BRANCH CIRCUIT WIRING, SEE PANEL RISER DIAGRAM.
  - EXISTING 24"x24"x 6" PULLBOX TO BE REMOVED AND REPLACED WITH NEW NON-METALLIC PULLBOX OF SAME SIZE AT EXISTING BOX LOCATION.
  - EXISTING UNDERGROUND 4" PVC COMMUNICATIONS CONDUIT TO BE CUT BACK FROM EXISTING ENTRY POINT AND ROUTED TO SIDE OF PUMP STATION WITH NEW SWEEP ENTRY THRU WALL. VERIFY LOCATION IN FIELD.
  - NEW 24"x24"x 6" NON-METALLIC PULLBOX AT CONDUIT ENTRY POINT, VERIFY LOCATION IN FIELD.
  - NEW VENTILATION FAN DIGITAL TIMESWITCH, SPST SINGLE CHANNEL DIGITAL 24 HOUR PROGRAMMING, 1 HP RATED CONTACTS, NEMA 3R ENCLOSURE. TORK #E101B OR EQUAL.
  - NEW PANEL 'PSH', 277/480V-3Ø,3W, MOUNTED ON UNISTRUT SUPPORT BRACKETS.
  - NEW POWER CENTER WITH PANEL 'PSR', 9KVA-120/208V-3Ø,3W.
  - VERIFY FEEDER ROUTING IN FIELD.
  - NEW TRIPLEX PUMP PACKAGE, 3-7.5HP-460V-3Ø PUMPS.
  - NEW TRIPLEX PUMP CONTROL PANEL, INTEGRAL 45A-3P MAIN DISCONNECT SWITCH, 460V-3Ø, 3 #6 + 1 #10 GND. - 1°C. TO 45A-3P BRANCH CB.
  - WELL PUMP #2 - 2HP-208V-3Ø: ONE (1) NEW NEMA SIZE 1 FUSIBLE COMBINATION STARTER WITH H-O-A SWITCH AND ADJUSTABLE THERMAL OVERLOADS, STAINLESS STEEL ENCLOSURE.
  - WELL PUMPS #3, 4 & 6 - 460V-3Ø: THREE (3) NEW NEMA SIZE 1 FUSIBLE COMBINATION STARTER WITH H-O-A SWITCH AND ADJUSTABLE THERMAL OVERLOADS, NEMA 1 ENCLOSURE.
  - ELECTRIC UNIT HEATER WITH INTEGRAL THERMOSTAT, 3KW-277V-1Ø. MOUNTED ON WALL BRACKET, VERIFY MOUNTING LOCATION IN FIELD. QMARK #MUH0371/UHMT1/B10.
  - INLINE CENTRIFUGAL EXHAUST FAN, 120V-1Ø, FANTECH FG-4 OR APPROVED EQUAL. PROVIDE ADAPTER COLLAR FOR MOUNTING FAN ON 6" DIA. VENT PIPING, CIRCUIT TO PANEL THRU TIMESWITCH.
  - WALL MOUNTED DEHUMIDIFIER, 500WATTS-120V-1Ø. VERIFY MOUNTING HEIGHT IN FIELD. PROVIDE 3/4" CONDENSATE TO EXISTING FLOOR DRAIN. POWDER COATED STEEL HOUSING, PROVIDE WALL MOUNTING BRACKET. EBAC MODEL GD30 OR EQUAL.



- REFER TO SPECIFICATIONS FOR ADDITIONAL NAMEPLATE REQUIREMENTS.
- NAMEPLATE TO BE 1/16" BLACK PLASTIC WITH WHITE CENTER LAMINATION. FACE TO BE BLACK, ENGRAVED LETTERS TO BE WHITE.
- SECURE NAMEPLATE TO SURFACES WITH ADHESIVES.

TYPICAL NAMEPLATE DETAIL  
NTS



PANEL RISER DIAGRAM  
NTS

- LEGEND — PANEL RISER DIAGRAM**
- EXISTING UNDERGROUND FEEDER TO SCHOOL BUILDING DISTRIBUTION PANEL TO REMAIN.
  - EXISTING PANEL 'PH7', 277/480V-3Ø,4W TO REMAIN. ADD: 1-100A-3P BRANCH CB.
  - EXISTING DRY TYPE TRANSFORMER, 45KVA-480/120/208V-3Ø,4W TO REMAIN.
  - EXISTING PANEL 'PHR', 120/208V-3Ø,4W TO REMAIN. TWO (2) EXISTING FEEDERS TO PUMP STATION DOMESTIC WATER PUMPS TO BE REMOVED, EXISTING 2 - 3" CONDUITS TO BE REUSED.
  - EXISTING UNDERGROUND FEEDERS TO EXISTING WELL PUMPS #3, #4 & #6.
  - EXISTING DISCONNECT SWITCHES AND MOTOR STARTERS TO BE DISCONNECTED AND REMOVED. LABEL THREE (3) EXISTING WELL PUMP CIRCUIT BREAKERS IN PANEL 'PH7' AS 'SPARE'.
  - INTERCEPT EXISTING WELL PUMP BRANCH CIRCUITS AND PROVIDE NEW WIREWAY.
  - INTERCEPT AND EXTEND EXISTING WELL PUMP BRANCH CIRCUITS TO NEW STARTERS LOCATED IN PUMP STATION.
  - EXISTING WIREWAY, PROVIDE NEW BARRIER AS REQUIRED.
  - NEW PANEL 'PSH' FEEDER: 4 #2 + 1 #8 GND. - 1 1/4". TO 100A-3P BRANCH CIRCUIT BREAKER.
  - EXISTING 2 - 3" UNDERGROUND PVC SCH.40 CONDUITS TO BE REUSED, ONE (1) CONDUIT FOR PANEL 'PSH' FEEDER AND ONE (1) CONDUIT FOR WELL PUMPS #3, #4 AND #6 BRANCH CIRCUIT WIRING. PANEL 'PSH' FEEDER: 4 #2 + 1 #8 GND. WELL PUMPS: 1Ø #8 + 1 #8 GND. EXTEND CIRCUITS TO NEW STARTER LOCATIONS, CONNECT EXISTING BRANCH CIRCUITS TO OUTPUT OF NEW STARTERS.
  - EXISTING 24"x24"x6" PULLBOX TO BE REMOVED AND REPLACED WITH NEW NON-METALLIC PULLBOX OF SAME SIZE.
  - NEW FEEDER: 4 #2 + 1 #8 GND. - 1 1/4".
  - NEW PANEL 'PSH', 277/480V-3Ø,4W. GROUND BUS AND NEUTRAL NOT TO BE BONDED IN PANEL.
  - 1 #8 Cu TO GROUND CLAMP ON WATER SERVICE AND BONDED TO GROUNDING GRID.
  - 3 #10 + 1 #10 GND. - 3/4". TO 25A-3P BRANCH CB.
  - NEW PANEL 'PSR', 120/208V-3Ø,4W.
  - 1 #10 Cu TO GROUND CLAMP ON WATER SERVICE AND BONDED TO GROUNDING GRID.
  - NEW WELL PUMP BRANCH CIRCUIT WIRING.
  - NEW WELL PUMP COMBINATION STARTER, "TYPICAL FOR THREE".

Name: PSH		NEMA 1 ENCLOSURE			SIEMENS TYPE P2					
Voltage: 277/480V-3ø,4W										
Mains: 100A/3P MAIN CB		MOUNTING: SURFACE								
WIRE NO	WIRE SIZE	LOAD DESCRIPTION	LOAD VA	BREAKER P	PHASE VA	BREAKER AMP	LOAD VA	LOAD DESCRIPTION	WIRE NO	WIRE SIZE
1	10	TRANSFORMER/PANEL 'PSR'	3000	3	25	5000	15	3	2000	8 2
3	10		3000			5000			2000	8 4
5	10		3000			5000			2000	8 6
7	6	TRIPLEX PUMP PACKAGE	4080	3	45	6080	15	3	2000	8 8
9	6		4080			6080			2000	8 10
11	6		4080			6080			2000	8 12
13		SPACE		3		2000	15	3	2000	8 14
15						2000			2000	8 16
17						2000			2000	8 18
19	12	ELECTRIC UNIT HEATER	3000	1	20	3000		1	SPACE	20
21		SPACE						1	SPACE	22
23		SPACE						1	SPACE	24
CONNECTED PHASE LOADS:			16080	13080	13080					
LIGHTS:			75 x 125% =		95					
RECEPTACLES:			180 x 100% =		180					
CONTINUOUS:			1000 x 125% =		1025					
ELECTRIC HEAT:			3000 x 100% =		3000					
MOTOR:			49988 x 100% =		49988					
LARGEST MOTOR:			9141 x 25% =		2285					
SERVICE DEMAND:			56,573VA / 831V =		68A					

Name: PSR		NEMA 1 ENCLOSURE				ACME TRANSFORMER PANEL-TRAN PRE-WIRED POWER CENTER 480V/120/208V-3ø,4W; 9KVA XFMR W/ 25A/3P PRIMARY MAIN CB											
Voltage: 120/208V-3ø,4W																	
Mains: 30A/3P MAIN CB		MOUNTING: SURFACE															
QTY	WIRE NO	WIRE SIZE	LOAD DESCRIPTION	LOAD VA	BREAKER P	AMP	PHASE VA	BREAKER P	AMP	LOAD VA	LOAD DESCRIPTION	WIRE NO	QTY				
1	12		LTG & REC	GFCI	250	1	20	1500		20	1	1250	POWER EXHAUST FAN	12	2		
3			SPARE			1	20			500		20	1	500	PUMP CONTROL PANEL	12	4
5			SPARE			1	20			500		20	1	500	DEMANDIFIER	12	6
7	12		WELL PUMP #2	828	3	15	828					20	1		SPARE		8
9	12			828				828			20	1		SPARE		10	
11	12			828					828	20	1		SPARE		12		
CONNECTED PHASE LOADS:							2328	1328	1328								
							LIGHTS:		75 x 125% =		95						
							RECEPTACLES:		180 x 100% =		180						
							CONTINUOUS:		1000 x 125% =		1025						
							MOTOR:		3734 x 100% =		3734						
							LARGEST MOTOR:		2484 x 25% =		621						
							SERVICE DEMAND:		5,655VA / 380V =		16A						

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Drawn By: MMV  
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Revision: [ ]  
Date: [ ]  
Rev: [ ]

Drawing date: March 11, 2016

ELECTRICAL PLAN AND RISER DIAGRAM

PREPARED FOR  
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Brookfield, Connecticut

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