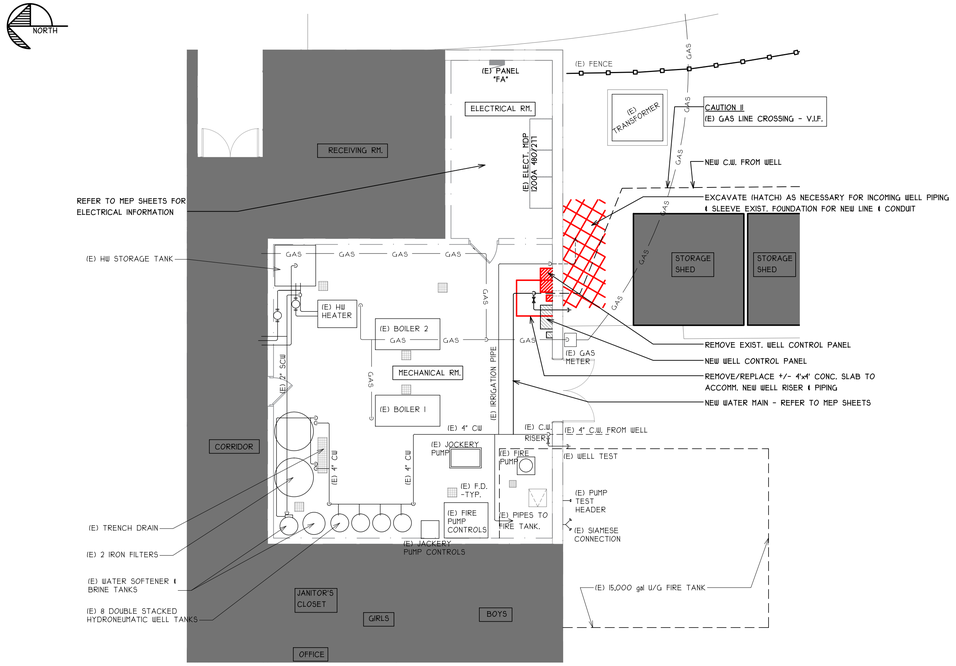
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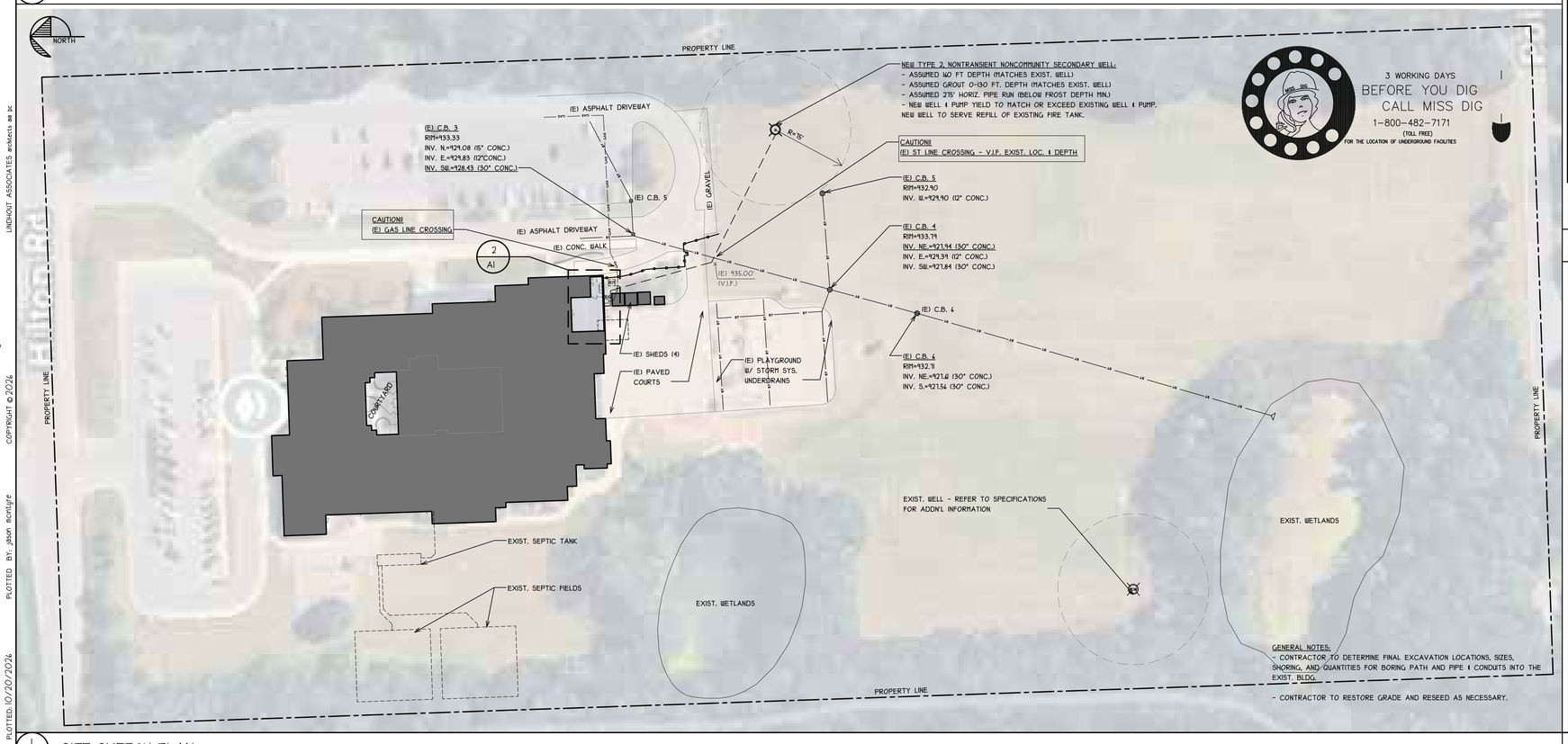
GENERAL NOTES:
- GENERAL WATER, TREATMENT SYSTEMS & WELL PIPING SHOWN FOR REFERENCE & L.C.H.D. REVIEW. REFER TO MEP SHEETS FOR MORE INFORMATION.

- F.P. PIPING IS NOT SHOWN HOWEVER, BLDG. IS FULLY SUPPRESSED. EXIST. U/G FIRE TANK IS REFILLED FROM THE EXIST. WELL. NEW WELL TO MATCH EXIST. WELL'S YIELD & REFILL FUNCTION.

- CONTRACTOR TO PROVIDE NEW THRU WALL WELL TEST MANIFOLD FOR NEW WELL.

2 / A1 ENLARGED PLAN

SCALE: 1/8" = 1'-0"



3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
(TOLL FREE)
FOR THE LOCATION OF UNDERGROUND FACILITIES

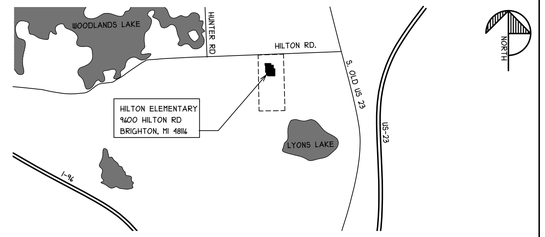
GENERAL NOTES:
- CONTRACTOR TO DETERMINE FINAL EXCAVATION LOCATIONS, SIZES, SHORING, AND QUANTITIES FOR BORING PATH AND PIPE & CONDUITS INTO THE EXIST. BLDG.

- CONTRACTOR TO RESTORE GRADE AND RESEED AS NECESSARY.

1 / A1 SITE SKETCH PLAN

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

BRIGHTON AREA SCHOOLS (BAS)
- HILTON ELEMENTARY -
NEW SECONDARY WELL PROJECT



LOCATION MAP

SCALE: N.T.S.

PROJECT DESCRIPTION:

THIS PROJECT CONSISTS OF INSTALLATION OF A NEW SECONDARY WELL FOR HILTON ELEMENTARY. THE WELL WILL RUN IN TANDEM WITH THE EXISTING WELL AND GIVE BACKUP & REDUNDANCY. BOTH WELLS ARE CONSIDERED TYPE II, NON-COMMUNITY PUBLIC WATER SUPPLY, PER L.C.H.D. ELECTRICAL AND PLUMBING MODIFICATIONS SHALL BE PROVIDED AS NOTED. NO CHANGES TO THE BUILDING, OCCUPANCY, SIZE CONSTRUCTION, EGRESS, ETC. ARE PROPOSED.

APPLICABLE CODES:

2021 MICHIGAN BUILDING CODE
2021 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS - LEVEL 2
2012 NFPA 101
2021 INTERNATIONAL FIRE CODE
2021 MICHIGAN PLUMBING CODE
2021 MICHIGAN MECHANICAL CODE
2023 NATIONAL ELECTRICAL CODE (STATE OF MI ELECTRICAL CODE W/ MI AMENDMENTS)

** BLDG. IS PROTECTED THROUGHOUT W/ AN APPROVED AUTOMATIC SPRINKLER SYSTEM PER SECTION 903 & NFPA 13
** BLDG. IS PROTECTED THROUGHOUT W/ AN APPROVED FIRE ALARM & DETECTION SYSTEM (INCLUDING EMERGENCY VOICE/ALARM COMMUNICATION SYSTEM) PER SECTION 907 & NFPA 72.

EXISTING BUILDING INFORMATION:

CONST. TYPE ——— TYPE IIB
USE GROUP ——— EDUCATIONAL "E"
STORIES/HT. ——— 1 STORIES
AREA ——— 63,490 S.F. EXISTING

	SHEET INDEX
A1	SITE SKETCH & ENLARGED PLAN
P1.1	ENLARGED PLUMBING PLAN
E0.1	GENERAL ELECTRICAL INFO
E1.1	ELECTRICAL FLOOR PLAN
E2.1	ELECTRICAL SPECIFICATIONS

LINE LEGEND

- NEW CONSTRUCTION
- EXISTING TO REMAIN
- HIDDEN WORK
- EXISTING TO BE REMOVED (RED TO BE PRINTED IN COLOR)

STATE OF MICHIGAN
D JASON MCINTYRE
ARCHITECT
No. 1301 056404
LICENSED ARCHITECT

CODE & PROJECT INFORMATION

Lindhout Associates architects aia pc
10465 citation drive, brighton, michigan 48116-9510
www.lindhout.com fax:(810)227-3855 (810)227-5668

BIDS & PERMITS	dr: djm	
OWNER REVIEW	ck'd: djm	10.20.2024
issued for	app'd: djm	10.15.2024
		date

SECONDARY WELL for:
BRIGHTON AREA SCHOOLS
(HILTON ELEMENTARY)
BRIGHTON, MICHIGAN

SITE SKETCH PLAN

A1

26022

LINDHOUT ASSOCIATES architects aia pc
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FILE LOCATION: H:\26022 - BAS Misc Services 2026\PROJECTS\Hilton - well\26022-Hilton Well - A1.dwg
PLOTTED BY: jason mcintyre
DATE PLOTTED: 10/20/2026

PLUMBING SPECIFICATIONS

GENERAL NOTES: PLUMBING

1. PROVIDE MATERIALS AND EQUIPMENT AND EXECUTE THE WORK, INCLUDING ALL TESTING AND INSPECTIONS, IN COMPLIANCE WITH THE APPLICABLE PROVISIONS OF FEDERAL, STATE AND LOCAL GOVERNMENT LAWS, ORDINANCES, REFERENCED CODES AND STANDARDS CURRENT AS OF THE ISSUE DATE OF THESE DRAWINGS. ALL MORE STRINGENT REQUIREMENTS OF THE CONTRACT DOCUMENTS SHALL MODIFY, SUPPLEMENT AND SUPERSEDE APPLICABLE PORTIONS OF GOVERNING LAWS, ORDINANCES, CODES AND STANDARDS.

2. CONTRACTOR SHALL PRESENT CERTIFICATE TO THE OWNER THAT ALL APPLICABLE BUILDING PERMITS HAVE BEEN SECURED PRIOR TO STARTING ANY WORK, AND PROVIDE THE OWNER WITH ALL REQUIRED CERTIFICATES OF FINAL APPROVAL FROM THE GOVERNING JURISDICTIONS AT COMPLETION OF THE WORK. PROVIDE ALL SHOP DRAWINGS AS REQUIRED IN FOLLOWING SECTIONS.

3. MAKE ALL CONNECTIONS TO EXISTING SYSTEMS DURING DESIGNATED PERIODS UPON APPROVAL OF THE OWNER AND AT NO INCREASE IN CONTRACT SUM.

4. COORDINATE EXACT LOCATION OF CONSTRUCTION TO PRECLUDE ANY INTERFERENCES BETWEEN PIPING, WIRING, LIGHTING FIXTURES, DUCTWORK, BUILDING EQUIPMENT, PROCESS EQUIPMENT AND OTHER CONSTRUCTION.

5. PROVIDE LABOR, INCLUDING FIELD ERECTION AND SUPERVISION, MATERIALS, EQUIPMENT AND ANCILLARIES, AND COORDINATE, PROCURE, FABRICATE, DELIVER, ERECT OR INSTALL, INTERFACE WITH EXISTING WORK, START, DEBUG AND TEST ALL SYSTEMS AS NECESSARY TO PROVIDE THE OWNER WITH A COMPLETE, OPERATING FACILITY IN CONFORMANCE WITH THE CONSTRUCTION BID DOCUMENTS.

6. ALL CUTTING AND PATCHING THAT MAY BE NECESSARY FOR THE INSTALLATION OF THE MECHANICAL CONTRACTOR'S WORK SHALL BE PERFORMED AND REPAIRED BY THE TRADE WHOM NORMALLY PERFORMS THAT WORK AND PAID FOR BY THE PLUMBING CONTRACTOR. NO CUTTING OF THE BUILDING STRUCTURAL SYSTEM SHALL BE PERFORMED WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT BEING PREVIOUSLY OBTAINED.

7. THE PLUMBING CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING HIS BID TO FAMILIARIZE HIMSELF WITH THE ACTUAL PROJECT CONDITIONS AND TO CHECK FOR ANY INTERFERENCES BETWEEN HIS WORK AND THAT OF THE OTHER TRADES, AND/OR ANY APPARENT VIOLATIONS OF LOCAL OR STATE CODES, LAWS, ORDINANCES AND REGULATIONS. SHOULD ANY VIOLATIONS OR INTERFERENCES APPEAR AND DEPARTURE FROM THE DESIGN INTENT OF THE CONTRACT DOCUMENTS IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO ENTERING INTO A CONTRACT WITH THE OWNER. FAILURE TO PROVIDE THE ARCHITECT WITH THE AFOREMENTIONED NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE INTENT OF THE CONTRACT DOCUMENTS WITH NO ADDITIONAL EXPENSES BEING INCURRED BY THE OWNER.

8. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL LOCATIONS AND ARRANGEMENTS OF ALL THE EQUIPMENT AND PIPING. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS BUILDING CONSTRUCTION AND ALL OTHER WORK WILL PERMIT. DO NOT SCALE DRAWINGS FOR EXACT MEASUREMENTS.

GENERAL NOTES: PLUMBING AND PIPING

1. THE PLUMBING AND PIPING SYSTEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL STATE AND LOCAL PLUMBING CODES. THE PLUMBING AND PIPING CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY ALL FEES, AND ARRANGE FOR ALL INSPECTIONS FOR HIS WORK. AT THE COMPLETION OF THE PROJECT, THE PLUMBING CONTRACTOR SHALL FURNISH THE OWNER WITH CERTIFICATES OF FINAL INSPECTIONS AND APPROVALS.

2. PIPING SHALL BE AS FOLLOWS:

   A. DOMESTIC WATER PIPING:

      1) ALL ABOVE GROUND DOMESTIC WATER PIPING SHALL BE TYPE "L" HARD DRAWN COPPER TUBING WITH WROUGHT COPPER OR CAST RED BRONZE FITTINGS. ALL SOLDERED FITTINGS SHALL BE MADE WITH SIL-FOS SOLDER OR AN APPROVED NON-TOXIC SOLDER. MECHANICAL TYPE FITTINGS EQUAL TO VIEGA "PROPRESS", APOLLO "EXPRESS" OR MUELLER "STREAMLINE" FOR COPPER PIPING ARE APPROVED IN LIEU OF SOLDERED FITTINGS. FITTINGS SHALL HAVE A VISUAL INDICATOR TO ALERT THE CONTRACTOR WHEN THE FITTING IS NOT PRESSED.

   B. VALVES:

      1) BALL VALVES SHALL BE TWO PIECE FULL PORT BRONZE BALL VALVES WITH STAINLESS STEEL TRIM, TFE SEATS WITH 316 STAINLESS STEEL BALL AND STEM. THREADED BODY PACK NUT DESIGN WITH ADJUSTABLE STEM PACKING WITH THREADED OR SOLDERED ENDS. RATED FOR 150 PSIG SWP AND 600 PSIG CWP.

      2) CHECK VALVES SHALL BE SWING CHECK WITH BRONZE DISC, CLASS 150, ASTM B62. Y PATTERN DESIGN WITH THREADED OR SOLDERED ENDS. RATED FOR 300 PSIG CWP.

   C. PIPING INSULATION:

      1) DOMESTIC COLD WATER PIPING SHALL BE INSULATED WITH MINIMUM 1" THICK FIBERGLASS INSULATION, WITH A FIRE RETARDANT JACKET, HAVING AN AVERAGE R VALUE OF 3.45. COLD WATER PIPING INSULATION SHALL BE PROVIDED WITH A VAPOR BARRIER. PROVIDE PREFORMED SECTIONS WITH PVC COVERS AT ALL FITTINGS.

3. PIPING SHALL BE SUPPORTED FROM HANGERS AT AN ADEQUATE DISTANCE WITH SUPPORTING HANGER RODS FASTENED TO THE BUILDING FRAMING WHENEVER POSSIBLE. SUPPORT SPACING SHALL NOT EXCEED THE HANGER SPACING REQUIREMENTS PER SECTION 308 OF THE LOCAL PLUMBING CODE.

4. ISOLATE PIPING AND EQUIPMENT FROM THE BUILDING STRUCTURE WITH INSULATING HANGERS AND FITTINGS AS REQUIRED TO PREVENT GALVANIC CORROSION OF THE BUILDING PIPING SYSTEMS.

5. CLEANING OF WATER PIPING

   A. BEFORE BEING PLACED IN SERVICE, ALL NEW DOMESTIC WATER DISTRIBUTION LINES SHALL BE CHLORINATED. AFTER THE PRESSURE TEST, AND BEFORE CHLORINATION, ALL DIRT AND FOREIGN MATTER SHALL BE REMOVED BY A THOROUGH FLUSHING WITH CLEAN POTABLE WATER THROUGH THE LINES, DISCHARGING THE FLOW FROM THE END OF THE LINES UNTIL DIRTY WATER DOES NOT APPEAR AT THE POINTS OF OUTLET.

   B. THE SYSTEM SHALL BE THOROUGHLY STERILIZED USING THE PROCEDURE REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.

6. IDENTIFICATION:

   A. LABEL ALL PIPING SYSTEMS WITH MANUFACTURED SELF ADHESIVE OR PRE-TENSIONED PIPE MARKERS. MARKERS SHALL INDICATE SERVICE AND DIRECTION OF FLOW. MARK PIPE NEAR: VALVES, BRANCH CONNECTIONS, PENETRATIONS, ACCESS DOORS AND NEAR MAJOR PIECES OF EQUIPMENT. MARKER SPACING SHALL NOT EXCEED 50'.

7. THE PLUMBING AND PIPING CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND PROVIDE ROUGH-INS FOR ALL EQUIPMENT FURNISHED BY OTHER CONTRACTORS. AFTER ALL EQUIPMENT HAS BEEN INSTALLED BY OTHER CONTRACTORS, THE PLUMBING AND PIPING CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS AND SHALL INCLUDE IN HIS BASE BID ALL VALVES, UNIONS, COUPLINGS, VACUUM BREAKERS, ETC., THAT ARE REQUIRED TO MAKE FINAL CONNECTIONS.

8. THE PLUMBING AND PIPING CONTRACTOR SHALL OBTAIN OTHER TRADES DRAWINGS AND COORDINATE HIS WORK WITH THE TOTAL PROJECT AS IT RELATES TO ALL TRADES AND VISIT THE PROJECT SITE PRIOR TO SUBMITTING HIS BID TO FAMILIARIZE HIMSELF WITH THE ACTUAL PROJECT CONDITIONS AND TO CHECK FOR ANY INTERFERENCES BETWEEN HIS SCOPE OF WORK AND THAT OF THE OTHER TRADES, AND/OR ANY APPARENT VIOLATIONS OF LOCAL OR STATE BUILDING CODES, LAWS, ORDINANCES, AND REGULATIONS. IF ANY INTERFERENCES OR VIOLATIONS APPEAR AND DEPARTURE FROM THE INITIAL DESIGN INTENT OF THE CONSTRUCTION BID DOCUMENTS IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO ENTERING INTO A CONTRACT WITH THE OWNER. FAILURE TO PROVIDE THE ARCHITECT WITH THE AFOREMENTIONED NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE INTENT OF THE CONSTRUCTION BID DOCUMENTS WITH NO ADDITIONAL COSTS BEING INCURRED BY THE OWNER.

9. THE CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT FURNISHED BY THIS CONTRACTOR WITH THE ELECTRICAL CONTRACTOR.

10. THE CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED UNDER THIS CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER THE ACCEPTANCE OF THE BUILDING BY THE OWNER, AND SHOULD DEFECTS OCCUR WITHIN THIS PERIOD, REPAIR AND/OR REPLACE DEFECTIVE ITEMS AND ANY DAMAGE RESULTING FROM FAILURE OF THESE ITEMS, AT NO EXPENSE TO THE OWNER.

11. THE CONTRACTOR SHALL COORDINATE LOCATIONS OF HIS EQUIPMENT AND WORK WITH OTHER BUILDING TRADES TO AVOID ANY INTERFERENCES BETWEEN HIS WORK AND THE WORK OF OTHER TRADES.

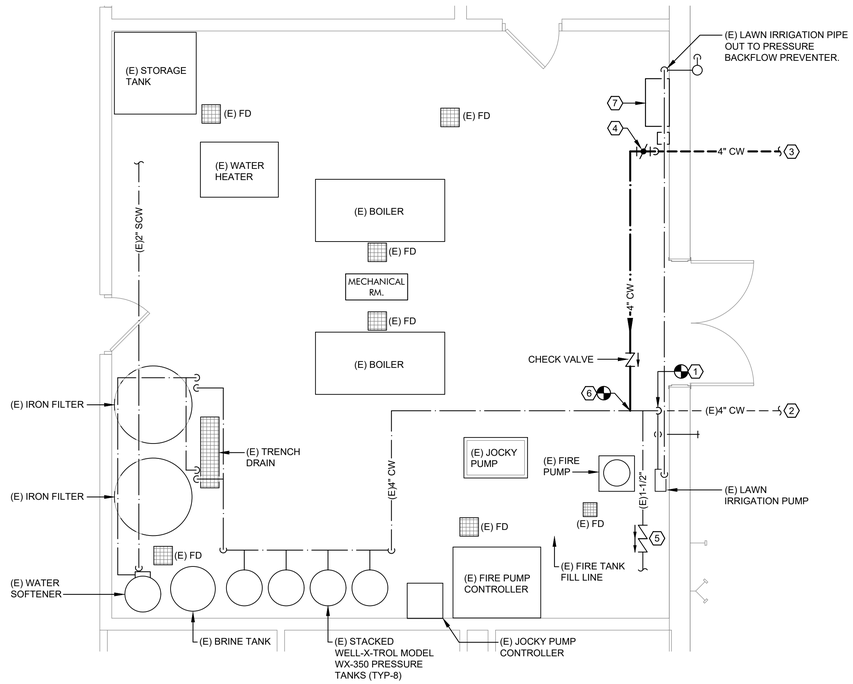
12. ANY CUTTING AND/OR PATCHING, THAT MAY BE REQUIRED FOR THE INSTALLATION OF THE PLUMBING AND PIPING SYSTEMS, SHALL BE PERFORMED BY THE ARCHITECTURAL TRADES AND PAID FOR BY THIS CONTRACTOR. NO CUTTING OF THE BUILDING STRUCTURAL SYSTEM SHALL BE PERFORMED WITHOUT WRITTEN APPROVAL OF THE ARCHITECT BEING OBTAINED.

13. COORDINATE ALL NEW LOCATIONS, SIZES AND ELEVATIONS OF SLEEVES THROUGH WALL SLABS AND FOUNDATIONS WITH EXISTING FIELD CONDITIONS.

14. SEAL ALL PENETRATIONS THROUGH WALLS AND FLOORS AIR AND WATERTIGHT. COORDINATE LOCATIONS AND ELEVATIONS OF ALL NEW UNDERGROUND UTILITIES WITH CIVIL SITE PLANS PRIOR TO START OF CONSTRUCTION.

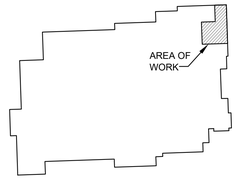
15. CONTRACTOR SHALL MAINTIAN ADEQUATE CLEARANCES (PER N.E.C.) ABOVE AND AROUND ANY NEW ELECTRICAL PANELS, EQUIPMENT AND TRANSFORMERS WHEN ROUTING OVERHEAD DOMESTIC WATER AND STORM PIPING.

1 P1.1 PLUMBING SPECIFICATIONS



2 P1.1 ENLARGED PLUMBING PLAN

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



KEY PLAN

N.T.S.

ABBREVIATIONS

CW	COLD WATER (DOMESTIC)
Ø	DIAMETER
(E)	EXISTING
FD	FLOOR DRAIN
GPM	GALLONS PER MINUTE
HP	HORSE POWER
SCW	SOFTENED COLD WATER
TYP.	TYPICAL

SYMBOLS

SYMBOL	DESCRIPTION
	BUTTERFLY VALVE
	CHECK VALVE
	PIPE TURNED UP
	PIPE TURNED DOWN
	PIPE OUT TOP
	PIPE OUT BOTTOM
	DOMESTIC COLD WATER PIPING

KEY NOTES: (#)

1. INSTALL NEW 4" CHECK VALVE IN VERTICAL PIPE BETWEEN GATE VALVE AND IRRIGATION PUMP @ APPROXIMATELY 32" ABOVE FLOOR.
2. EXISTING 4" WATER SERVICE FROM PRIMARY WELL PUMP.
3. 4" WATER SERVICE FROM NEW SECONDARY WELL PUMP.
4. PROVIDE SHUT-OFF VALVE @ 12" ABOVE FLOOR AT WATER SERVICE ENTRY POINT.
5. EXISTING 1-1/2" REDUCED PRESSURE BACKFLOW PREVENTER FOR FIRE PROTECTION TANK FILL TO REMAIN.
6. CONNECT NEW WATER MAIN INTO EXISTING 4" MAIN IN THIS LOCATION. CONNECT PIPE DURING UNOCCUPIED HOURS TO AVOID INTERRUPTION OF WATER AND NEED FOR FIRE WATCH.
7. REMOVE EXISTING FRANKLIN ELECTRIC PUMP CONTROLLER AND REPLACE WITH A NEW DUPLEX ALTERNATING PUMP CONTROLLER. THE NEW PANEL SHALL HAVE A HAND-OFF-AUTO SWITCH, A MAGNETIC CONTACTOR, VARIABLE SPEED DRIVE AND OVERLOAD PROTECTION FOR EACH PUMP. CONTRIOLLER SHALL BE SJE RHOMBAS ENDURA DUPLEX MODEL EN32-480-29.5 CONTRACTOR SHALL VERIFY EXACT MODEL WITH EXISTING 15HP PUMP AND NEW WELL PUMP HP PRIOR TO ORDERING THE NEW CONTROLLER. (CONTACT JIM FELKER @ SALES SERVICE PLUS 248-513-9323 FOR ORDERING INFORMATION.)

WELL PUMP SEQUENCE OF OPERATION:

LEAD-LAG ALTERNATION SWITCH: THE DUPLEX CONTROLLER MONITORS THE CALLS FOR WATER. WHEN THE PRESSURE FALLS, THE CONTROLLER ACTIVATES PUMP 1 (LEAD). ON THE SUBSEQUENT CYCLE, A BUILT-IN MECHANICAL OR ELECTRONIC ALTERNATING RELAY FLIPS THE PRIORITY, ASSIGNING PUMP 2 (LEAD) TO HANDLE THE NEXT DROP.

STATE OF MICHIGAN
JORDAN KOENIG
ENGINEER
No. 6201059789
REGISTERED PROFESSIONAL ENGINEER
10/20/26

MEEC JOB # 26-0196

THIS DRAWING IS DIAGRAMMATIC AND SHOULD BE USED TO DETERMINE THE DESIGN INTENT. THE CONTRACTOR SHALL FIELD VERIFY ALL WORK AND SHALL NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES IN THE DOCUMENTS BEFORE PROCEEDING. FAILURE TO DO SO WILL RESULT IN THE CONTRACTOR TAKING FULL RESPONSIBILITY AND LIABILITY FOR SAID DISCREPANCIES. NOTICE: THIS DRAWING AND THE DESIGN ARE THE PROPERTY OF MECHANICAL ELECTRICAL ENGINEERING CONSULTANTS, PC AND NO ALTERATIONS AND/OR TRANSFERS OF WORK ARE PERMITTED UNLESS WRITTEN APPROVAL IS GRANTED BY MECHANICAL ELECTRICAL ENGINEERING CONSULTANTS, PC.

NORTH

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consultant

BIDS & PERMITS issued for

10.20.2026 date

dr: W.V. ck'd: W.V. app'd J.K.

SECONDARY WELL for: BRIGHTON AREA SCHOOLS (HILTON ELEMENTARY) BRIGHTON, MICHIGAN

ENLARGED PLUMBING PLAN

P1.1

26022

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FILE LOCATION: A-LINDHOUT\26-0196 Hilton Elementary Well Pump\P1.1 - PARTIAL FIRST FLOOR - PLUMBING NEW WORK PLAN.dwg
DATE PLOTTED: 10/20/2026 PLOTTED By: william vermeer

ELECTRICAL SYMBOL LIST

POWER SYMBOLS

SYMBOL	DESCRIPTION
J	JUNCTION BOX - WALL MOUNTED, HEIGHT AS NOTED
M	KWH METER
30/60	FUSIBLE DISCONNECT SWITCH - UPPER NUMERAL DENOTES SWITCH SIZE, LOWER NUMERAL DENOTES FUSE SIZE
30	NON-FUSED DISCONNECT SWITCH - NUMERAL DENOTES SWITCH SIZE
	MAGNETIC MOTOR STARTER
	COMBINATION MOTOR STARTER
SMP	MOTOR CONTROL SWITCH WITH PILOT LIGHT
SM	MANUAL MOTOR STARTER, OR ON MOTORIZED EQUIP.
	MOTOR CONNECTION
	PANELBOARD
	MAIN SWITCHBOARD
T	TRANSFORMER
	CONTROL PANEL

ONE-LINE DIAGRAM SYMBOLS

SYMBOL	DESCRIPTION
200AF / 175AT	CIRCUIT BREAKER - UPPER NUMERAL DENOTES AMPERAGE FRAME RATING AND LOWER NUMERAL INDICATES TRIP RATING
200 / 110	FUSIBLE DISCONNECT SWITCH - UPPER NUMERAL DENOTES SWITCH SIZE, LOWER NUMERAL DENOTES FUSE SIZE
	GROUND
	TRANSFORMER

WIRING & CONDUIT SYMBOLS

SYMBOL	DESCRIPTION
	CONDUIT RUN IN WALL OR ABOVE CEILING
	CONDUIT RUN BELOW GRADE OR CONCRETE SLAB
	BRANCH CIRCUIT HOMERUN
	LOW VOLTAGE WIRING FOR LIGHTING CONTROL
NOTE:	ANY CIRCUIT WITHOUT FURTHER IDENTIFICATION IS 2-WIRE PLUS GROUND WIRE. A GREATER NUMBER OF WIRES IS INDICATED BY HASH MARKS.
	EXISTING TO BE REMOVED OR ABANDONED

PROJECT SPECIFIC NOTES

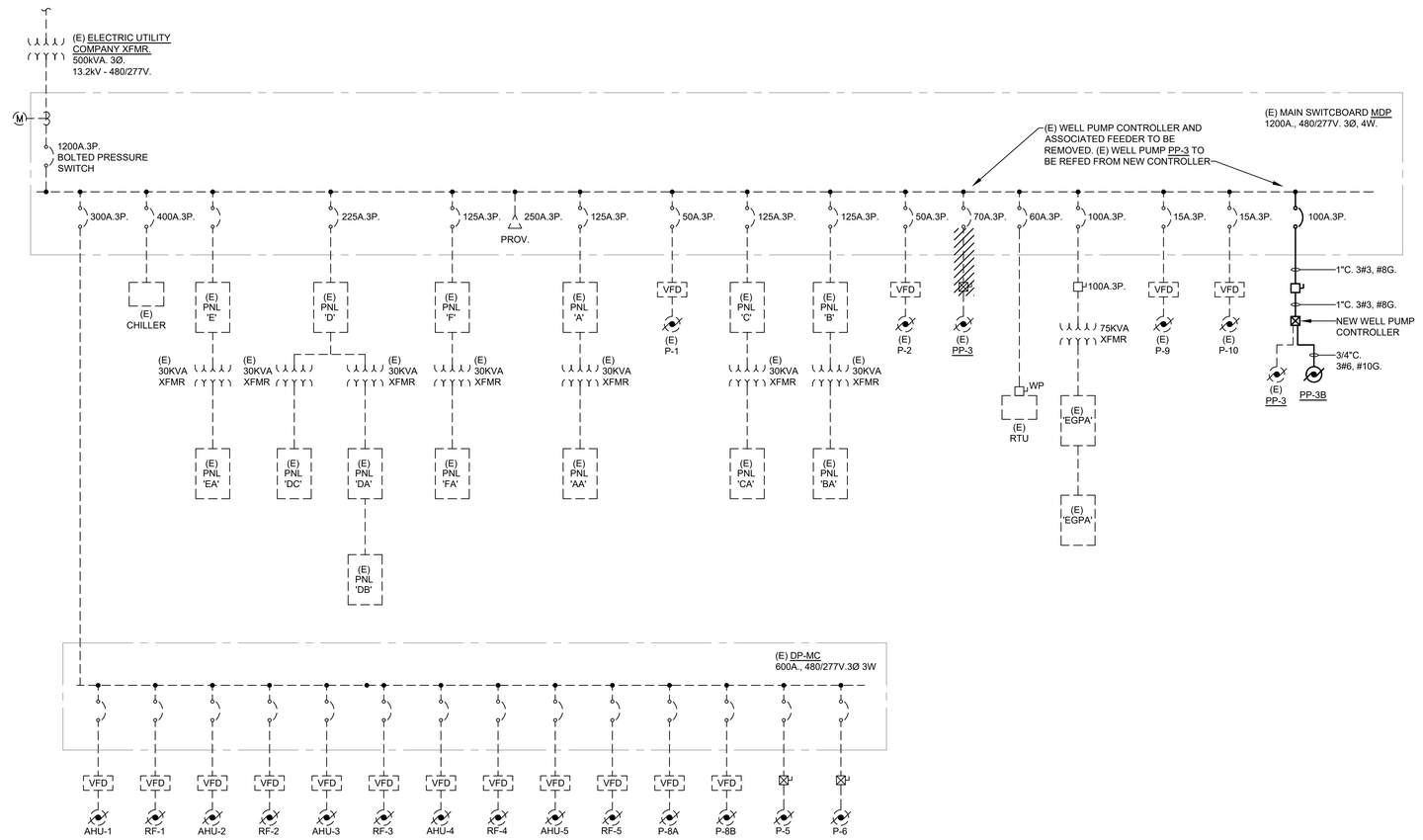
1. APPLICABLE CODES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, THE FOLLOWING:
   - 1.1. 2021 MICHIGAN BUILDING CODE
   - 1.2. 2023 NEC WITH MICHIGAN PART 8 AMENDMENTS
   - 1.3. 2017 ICC ANSI STANDARD A117.1-2017
   - 1.4. 2021 INTERNATIONAL FIRE CODE
2. CONTRACTOR SHALL PROVIDE NAMEPLATES FOR ALL NEW ELECTRICAL EQUIPMENT.
3. ALL NEW WIRING AND BUSSING SHALL BE COPPER, UNLESS OTHERWISE NOTED.
4. A SEPARATE EQUIPMENT GROUNDING CONDUCTORS, SIZED PER NEC, SHALL BE INSTALLED WITH ALL CIRCUIT CONDUCTORS.
5. PROVIDE A THERMAL-ADHESIVE LABEL ON EACH DEVICE (LIGHT SWITCH, RECEPTACLE, ETC.) INDICATING THE SOURCE PANEL AND CIRCUIT NUMBER.

GENERAL NOTES

1. THE CONTRACTOR SHALL ABIDE BY ALL FEDERAL, STATE, AND/OR LOCAL CODES. IF A DISCREPANCY BETWEEN CODES OCCURS, THE MOST STRINGENT SHALL PREVAIL.
2. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO THE COMMENCEMENT OF ANY WORK. SHOULD DISCREPANCIES BE DISCOVERED, THE CONTRACTOR SHALL VERIFY INTENT WITH THE ENGINEER/OWNER BEFORE PROCEEDING.
3. COORDINATE LOCATIONS OF ALL CEILING MOUNTED DEVICES WITH OTHER TRADES PRIOR TO INSTALLATION.
4. COORDINATE ALL ROUGH-IN REQUIREMENTS FOR OWNER FURNISHED EQUIPMENT WITH THE OWNER PRIOR TO BEGINNING WORK. THESE DRAWINGS ARE BASED ON THE BEST INFORMATION AVAILABLE DURING THE DESIGN PHASE OF THE PROJECT.
5. ELECTRICAL CONTRACTOR SHALL PROVIDE SAFETY DISCONNECT SWITCHES FOR ALL MECHANICAL AND PLUMBING EQUIPMENT.
6. MULTI-WIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH THE MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNDERGROUND CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES. REFER TO 2023 NEC 210.4 (B). THIS APPLIES TO ALL MULTI-WIRE BRANCH CIRCUITS SUPPLYING ANY LOAD.
7. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT-CARRYING CONDUCTORS. HOMERUNS CONTAINING MORE THAN THREE CURRENT-CARRYING CONDUCTORS SHALL BE DERATED IN ACCORDANCE WITH THE 2023 NEC.
8. BRANCH CIRCUIT HOMERUN CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE 2023 NEC. THE MAXIMUM ALLOWABLE VOLTAGE DROP ON A FEEDER IS 2% AND THE MAXIMUM ALLOWABLE VOLTAGE DROP ON A BRANCH CIRCUIT IS 3%. PROVIDE BRANCH CIRCUIT CONDUCTORS SIZED TO ENSURE THE TOTAL VOLTAGE DROP FROM THE SOURCE TO THE POINT OF UTILIZATION IS LESS THAN OR EQUAL TO 5%.
9. DEDICATED NEUTRALS SHALL BE PROVIDED FOR ALL BRANCH CIRCUITS, EXCEPT WHERE A MULTI-WIRE CIRCUIT IS REQUIRED TO SERVE THE LOAD (I.E. SYSTEMS FURNITURE). WHEN SHARING THE NEUTRAL CONDUCTOR IN A MULTI-WIRE CIRCUIT, THE NEUTRAL SIZE SHALL BE INCREASED 177%.
10. ALL MOUNTING HEIGHTS PROVIDED ARE TO CENTER OF DEVICE, UNLESS OTHERWISE INDICATED.

GENERAL NOTES - DEMOLITION

1. CERTAIN AREAS IN THE EXISTING BUILDING SHALL BE MODIFIED TO SUIT THE NEW REQUIREMENTS. THESE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED TO COMPLETE A SAFE REMOVAL OF THE ELECTRICAL SYSTEMS AS INDICATED BY THE NOTES ON THIS DRAWING.
2. WORK IN THE AREA SHALL INCLUDE THE DISCONNECTION, REMOVAL, RELOCATION, AND RECONNECTION COMPLETE IN ALL RESPECTS OF ALL ITEMS REQUIRED TO SUIT THE DESIGN INTENT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE PROJECT SITE TO CORRECTLY ASCERTAIN THE SCOPE OF SERVICES AND TO INCLUDE ALL PERTINENT COSTS IN HIS BID. NO EXTRAS WILL BE ALLOWED.
3. ALL ELECTRICAL WORK INTERFERING WITH AND REQUIRING MODIFICATION FOR THE NEW REQUIREMENTS SHALL BE RELOCATED AS DIRECTED BY BUILDING MANAGEMENT PERSONNEL AND REINSTALLED AND REWIRED AS NECESSARY TO THE SATISFACTION OF THE BUILDING OWNER.
4. PROVIDE ALL EQUIPMENT, MATERIALS, LABOR AND SUPERVISION NECESSARY TO PROVIDE A SAFE ELECTRICAL INSTALLATION. ALL ELECTRICAL DEVICES AND SYSTEMS THAT ARE INDICATED AS EXISTING TO REMAIN SHALL BE IN SAFE WORKING ORDER.
5. OBTAIN NECESSARY PERMITS FROM THE LOCAL AUTHORITY HAVING JURISDICTION BEFORE PROCEEDING WITH ANY WORK IN THE FIELD.
6. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, OSHA AND OTHER ELECTRICAL SAFETY STANDARDS AND GUIDELINES. CONFORM TO ALL STATE AND LOCAL CODES AND STANDARDS.
7. ALL EQUIPMENT AND WIRING NOT IN RENOVATION AREAS BUT AFFECTED BY WORK IN RENOVATION AREAS SHALL BE RECONNECTED AS REQUIRED FOR A COMPLETE WORKING SYSTEM.
8. ABANDONED AND INACTIVE CONDUITS, WIRE, DEVICES, EQUIPMENT, ETC., SHALL BE REMOVED IN THEIR ENTIRETY. IN ADDITION TO THESE ITEMS, THIS CONTRACTOR SHALL REMOVE ALL ITEMS AS INDICATED ON THE PLANS, OR AS REQUIRED TO CLEAN UP THE ENTIRE AREA OF UNUSED, ABANDONED, OR INACTIVE MATERIALS. CONDUIT AND WIRING FEEDING DEVICES AND EQUIPMENT TO BE REMOVED SHALL ALSO BE REMOVED UP TO THE NEXT ACTIVE PULLBOX, JUNCTION BOX, OR PANELBOARD. HANGERS, MESSENGER CABLE, BRACKETS, ETC; SUPPORTING ITEMS TO BE REMOVED SHALL ALSO BE UNFASTENED AND REMOVED. OPEN HOLES IN DUCTS, BOXES, PANELBOARDS, AND KNOCKOUTS SHALL BE CLOSED WITH SUITABLE SNAP PLUGS OR FILLER PLATES.
9. THE CONTRACTOR SHALL REMOVE AND DELIVER TO A PLACE DESIGNATED BY THE OWNER ALL EXISTING ELECTRICAL EQUIPMENT NO LONGER INTENDED FOR USE. THIS EQUIPMENT REMAINS THE PROPERTY OF THE OWNER.
10. ANY EQUIPMENT, DEVICES, MATERIALS, ETC., THE OWNER ELECTS NOT TO RETAIN SHALL BE LEGALLY DISPOSED OF BY THE CONTRACTOR OFF THE OWNER'S PREMISES.
11. AT COMPLETION OF ALL ELECTRICAL WORK, UPDATE CIRCUIT DIRECTORIES IN PANELS AFFECTED BY NEW WORK WITH NEW TYPEWRITTEN CIRCUIT DESCRIPTIONS. CIRCUIT DIRECTORIES SHALL BE MOUNTED ON INSIDE OF FRONT PANEL COVER IN A CLEAR PLASTIC ENCLOSURE.
12. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, AND IN ACCORDANCE WITH THEIR LISTING OR LABELING REQUIREMENTS. ANY PENETRATIONS THROUGH FIRE RATED ASSEMBLIES THAT ARE CREATED BY THE ELECTRICAL DEMOLITION, SHALL BE SEALED AND RESTORED IN ACCORDANCE WITH THE UL FIRE RESISTANCE DIRECTORY.
13. WHERE CONDUIT AND/OR OUTLET BOXES INDICATED FOR DEMOLITION ARE EMBEDDED IN CONCRETE OR BELOW CONCRETE SLAB, ABANDON IN PLACE. CUT BACK AND SEAL EXPOSED CONDUIT. PROVIDE BLANK COVERS FOR ABANDONED BOXES. REMOVE ALL ASSOCIATED WIRING BACK TO SOURCE.



ELECTRICAL ONE-LINE DIAGRAM

N.T.S.

STATE OF MICHIGAN
JORDAN KOENIG
ENGINEER
No. 6201059789
REGISTERED PROFESSIONAL ENGINEER
10/20/26

MEEC JOB # 26-0196

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consultant

BIDS & PERMITS issued for

10.20.2026 date

dr: Z.M. ck'd: Z.M. app'd: J.K.

SECONDARY WELL for:
BRIGHTON AREA SCHOOLS
(HILTON ELEMENTARY)
BRIGHTON, MICHIGAN

GENERAL ELEC. INFO.

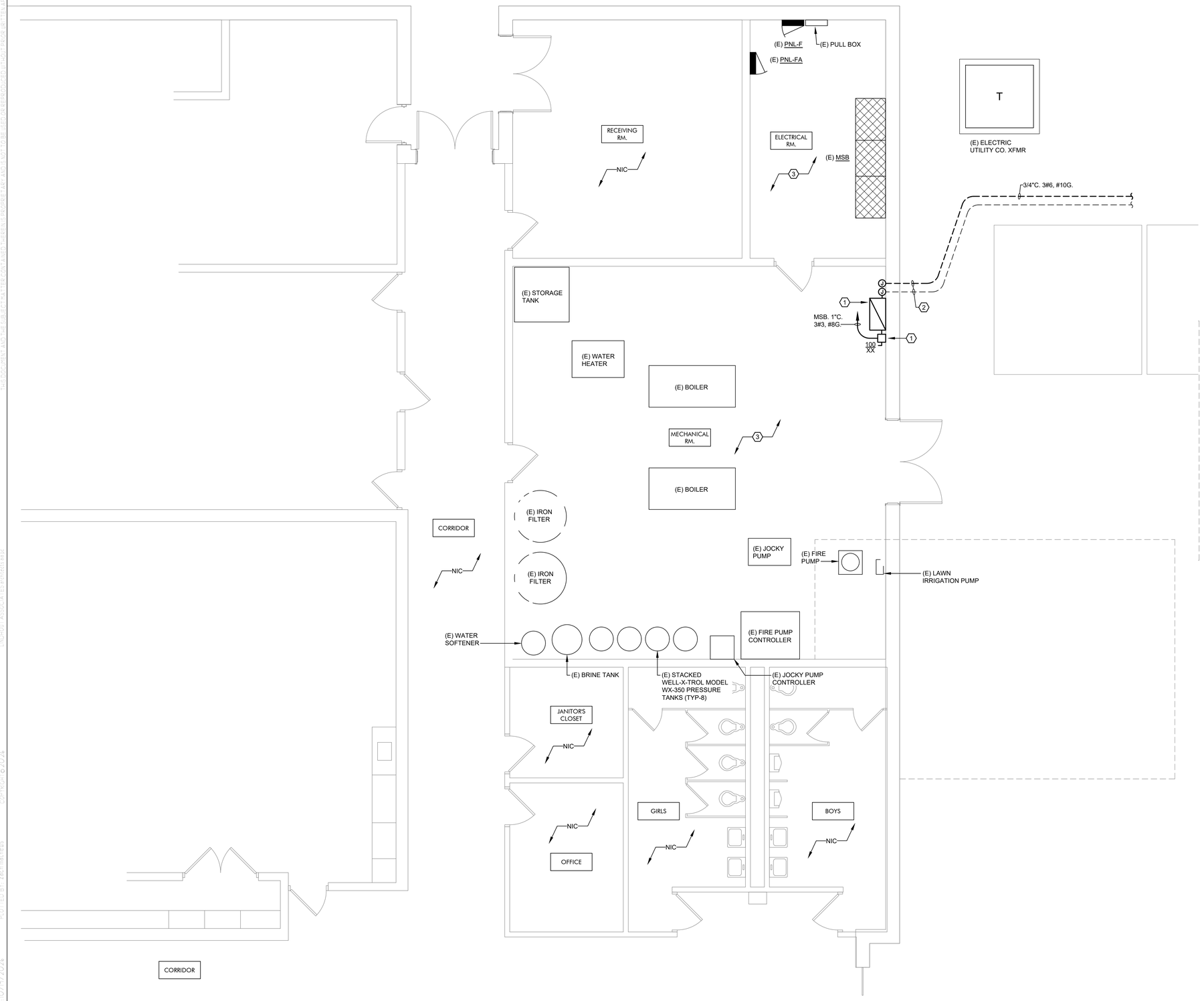
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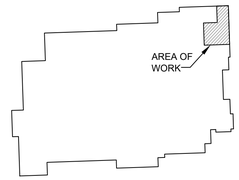
26022

E0.1 GENERAL ELECTRICAL INFORMATION

SCALE: NONE

THIS DRAWING ARE GRAPHICALLY MATCHED ONTO AERIAL PROPERTY AND CONTRACTOR MUST FIELD VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. ANY DISCREPANCIES FOUND MUST BE REPORTED IMMEDIATELY TO THE ARCHITECT. DRAWINGS ARE NOT TO BE SCALED FROM. DIMENSIONS GOVERN.
FILE LOCATION: A:\LINDHOUT\26-0196 Hilton Elementary\Revit Plans\E0.X - COVER.rvt
DATE PLOTTED: 10/16/2026 PLOTTED BY: zach.mathias
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KEY PLAN
N.T.S.

GENERAL NOTES:

1. REFER TO SHEET E0.1 FOR ELECTRICAL ONE-LINE DIAGRAM, SYMBOL LIST, ABBREVIATIONS AND PROJECT NOTES.
2. REFER TO CIVIL ENGINEERING DRAWINGS FOR ADDITIONAL INFORMATION.
3. UNDERGROUND CONDUITS FOR BRANCH CIRCUITS SHALL BE INSTALLED A MINIMUM OF 18" BELOW GRADE AND 24" BELOW PAVEMENT, UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL VERIFY ALL NEW AND EXISTING UNDERGROUND UTILITY SERVICES TO AVOID ANY INTERFERENCES.
5. CONTRACTOR SHALL CONTACT "MISS DIG 811" TO LOCATE UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.
6. WHERE ENCLOSURES OR RACEWAYS ARE INSTALLED OUTDOORS ABOVE OR BELOW GRADE, THE INTERIOR OF THE RACEWAY SHALL BE CONSIDERED A WET LOCATION. PROVIDE CONDUCTORS THAT ARE LISTED FOR USE IN WET LOCATIONS.
7. ELECTRICAL CONTRACTOR SHALL PROVIDE POWER, BOXES AND RACEWAYS FOR COMMUNICATION WIRING AS NEEDED. EQUIPMENT, DEVICES, FACEPLATES AND CABLING BY OTHERS.
8. PROVIDE PULL STRING IN ALL EMPTY CONDUITS.
9. ALL OUTLETS MOUNTED IN 1-HOUR FIRE RATED ASSEMBLIES SHALL BE PROVIDED WITH FIRE-STOP PUTTY PADS BEHIND OUTLETS TO MAINTAIN THE 1-HOUR FIRE RATING. ALL FIRE STOPPING MATERIALS USED ON THE PROJECT SHALL MEET THE APPROVAL OF THE LOCAL AUTHORITY HAVING JURISDICTION.
10. PROVIDE AIR-VAPOR BARRIER BOXES FOR ALL BOXES INSTALLED IN WALLS WITH VAPOR BARRIERS. PROVIDE SEALANT AROUND WIRE PENETRATIONS AND TAPE TO SEAL VAPOR BARRIER TO BOX.

KEY NOTES: (#)

1. EXISTING WELL PUMP CONTROLLED TO BE REPLACED WITH NEW ALTERNATING PUMP CONTROLLER PER PLUMBING DRAWINGS. EXISTING FEEDER TO BE DEMOLISHED AND REMOVED BACK TO MAIN SWITCHBOARD AND REFED VIA DISCONNECT, FUSES SIZED PER MANUFACTURER'S SPECIFICATIONS. REFER TO ONE-LINE DIAGRAM, SHEET E0.1, FOR ADDITIONAL INFORMATION.
2. EXISTING WELL PUMP BRANCH CIRCUIT TO BE REFED FROM NEW ALTERNATING PUMP CONTROLLER. PROVIDE FEED FOR NEW WELL PUMP VIA CONTROLLER. VERIFY FINAL LOCATION OF WELL PUMP WITH CIVIL ENGINEERING AND ASSOCIATED VENDORS BUT ASSUME APPROXIMATELY 400-FT RUN FOR BIDS. REFER TO ONE-LINE DIAGRAM, SHEET E0.1, FOR ADDITIONAL INFORMATION.
3. ALL EQUIPMENT IN THIS ROOM IS EXISTING TO REMAIN AND SHOWN ONLY FOR REFERENCE, UNLESS OTHERWISE NOTED.

STATE OF MICHIGAN
REGISTERED PROFESSIONAL ENGINEER
JORDAN KOENIG
ENGINEER
No. 6201059789
10/20/26

MEEC JOB # 26-0196

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NORTH

E1.1 PARTIAL FIRST FLOOR - ELECTRICAL PLAN

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

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consultant

BIDS / PERMITS issued for

dr: Z.M.	10.20.2026
ck'd: Z.M.	date
app'd: J.K.	

SECONDARY WELL for:
BRIGHTON AREA SCHOOLS
(HILTON ELEMENTARY)
BRIGHTON, MICHIGAN

ELECTRICAL FLOOR PLAN

E1.1

26022

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DATE PLOTTED: 10/19/2026
PLOTTED BY: zachmattews

GENERAL CONDITIONS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications sections, apply to work of this section. The Electrical Contractor shall assume all obligations contained therein that affect his work. The Electrical Engineer shall be consulted in case of any disputes and his decision shall be final.

B. The Electrical Contractor shall examine the Architectural, Plumbing and Mechanical Drawings and Specifications and shall familiarize himself with all conditions of work affecting the contract. Size and capacity of all equipment shall be as on plans or as indicated herein.

C. Furnish labor and materials to provide a complete electrical system as required by the plans and specifications.

D. Any item appearing on the drawings and not in the specification or vice versa, and any items appearing in neither but necessary to accomplish the intent of these specifications, shall be furnished by the Electrical Contractor.

E. Where equipment specifications or descriptions include a specific manufacturer and catalog number, any substituted equipment or equipment proposed to be provided by an alternative manufacturer shall functionally meet, or exceed, the requirements of the specified equipment in all respects. Alternate manufacturers shall refer to product literature published by the manufacturer of the equipment specified to determine equivalency of their proposed alternate product to that specified.

WORK INCLUDED

A. These specifications and accompanying drawings contemplate the provisions by the Electrical Contractor of all labor and materials required to install a complete system of electrical work as indicated on the drawings and or/or herein specified. Without restricting the generality of the foregoing, the following shall be included:

1. Safety switches, branch circuit wiring, outlets and connection complete.
2. Modifications of existing electrical distribution systems if indicated on the Drawings.
3. Grounding of complete electrical system per Article 250 of NEC and specifications.
4. Service and connections of equipment as specified.
5. Disconnect switches which are not an integral part of equipment.

ELECTRICAL SUBMITTALS

A. Refer to the Conditions of the Contract (General and Supplementary) and Division 1 Section: SHOP DRAWINGS, PRODUCT DATA AND SAMPLES for submittal definitions, requirements, and procedures.

B. Submittal of shop drawings, product data and samples will be accepted only when submitted by The Contractor. Data submitted when subcontractors and material suppliers directly to the Architect/Engineer will not be processed.

C. When some errors in the shop drawings are detected and others are overlooked, this does not grant the contractor permission to proceed in error. Regardless of any information contained in the shop drawings the requirements for the drawings and specifications must be followed and are not waived or superseded in any way by the shop drawing review.

D. The Electrical Contractor shall be responsible for final coordination of all electrical feeders and over current protection devices (circuit breaker and/or fuses) with the manufacturers written data for each mechanical device prior to submittal of any electrical equipment for review. No additional compensation will be allowed for any changes to electrical feeders or over current protection devices required for any mechanical devices.

SUBSTITUTIONS

A. Alternate manufacturers electrical equipment shall be similar in performance, physical appearance, and construction to be considered as equal to equipment specified.

B. Alternate manufacturers electrical equipment proposed to be substituted by bidding contractor must be pre-approved during bidding. The Contractor, or equipment representative, shall email all such requests with equipment cut sheets to the Engineer at least one week prior to submitting bids. Engineer will review to proposed alternate equipment and issue a written acceptance or denial by email. VERBAL APPROVAL WILL NOT BE ACCEPTABLE.

C. All equipment shop drawings, fixture cut sheets, etc., submitted after award of contract for electrical equipment which was not pre-approved will be rejected.

D. In the event substitutions are proposed to the Engineer after the contract has been awarded, the Engineer will record all time used by him in evaluation of each proposed substitution.

E. Whether or not the Engineer approves the proposed substitution, the Contractor agrees to promptly upon receipt of the Engineer's billing, reimburse the Engineer according to the Schedule of Hourly Rates for all time spent in the evaluation of the proposed substation.

REGULATIONS

A. All work shall be installed in accordance with the local electrical code, the requirements of the local utility companies and the requirements and recommendations of the National Electrical Code.

B. Where Conflict exists between codes or utility company requirements and contract documents, the more stringent shall apply.

C. The installation of telephone service entrance conduit systems shall be as shown and shall comply with the requirements of the local telephone company. Contractor shall verify the exact point of service with the telephone company representative before commencing with the installation of the service entrance conduits.

STANDARDS OF MATERIAL AND WORKMANSHIP

A. All work shall be done at such times and in such a manner as will least interfere with the maintenance and operation of all related or affected systems.

B. All materials and equipment shall bear the label of approved of the National Board of Fire Underwriter's Laboratories.

C. The Electrical Contractor shall effectively protect, at his own expense, such of his work, materials or equipment as is liable to injury during the construction period.

D. All openings into any part of the conduit system as well as associated fixtures, equipment, etc., both before and after being set in place, must be securely covered, or otherwise protected to prevent obstruction of the conduit, injury due to carelessness or maliciously dropped tools or materials, grit, dirt or any foreign matter, The Electrical Contractor shall be held responsible for all damage so done until his work is fully and finally accepted. Conduit ends shall be covered with capped bushings. All electrical equipment shall be grounded.

E. It is not intended that the drawings or this specification indicate or specify each piece of conduit, fittings, etc., required for installation. Where items are required for the satisfactory operation of the installation and are not indicated on the drawings, they shall be considered to be both specified and indicated.

F. General requirements and details of equipment are shown. Dimensions or scales shown are approximate and must be checked at job prior to installation of equipment or any order given for fabrication.

G. Electrical Contractor shall have competent foreman on the premises at all times to superintend and check and lay out all work, give information to General Contractor regarding chases and openings, and be responsible for such locations; This Contractor shall cooperate with other contractors where chases, openings, pipes, foundations, etc., are in proximity to the work of other trades and arrange the work to fit. This Contractor shall study where other trades leave connections and outlets to be connected, so that all work and appliances shall be properly arranged for and connected ready for use.

PARTS RECEIPT

A. Retain all portable and detachable portions of the installation such as keys, tools, manuals, etc., until the completion of the work and then turn over to the Owner and obtain itemized receipts. These receipts shall be attached to the "Final Application" for payment.

INSPECTION OF SITE

A. The contractor shall visit the site and verify the conditions under which his work must be conducted before submitting his proposal. The submitting of a proposal implies that the Contractor has visited the site, is conversant with all side conditions, including existing services and equipment, obstructions and all conditions, which will be encountered in the removal and/or relocation of present materials and equipment, installation of new materials and cutting and patching, etc., for a complete installation. If any interferences or violations appear and departure from the design intent of the bid documents is required, the contractor shall notify the Architect prior to entering into contract with the Owner. Failure to provide the Architect with the aforementioned notification will result in the contractor being held responsible to complete all work to meet the design intent of the bid documents with no additional expenses being incurred by the Owner, Architect or Engineer.

EXISTING PANELBOARDS AND BRANCH CIRCUITS

A. Where existing panelboards are scheduled on the Drawings, the Contractor shall field-verify the existing circuit breakers and loads. Provide all circuit breakers indicated on the schedules if they are not existing.

B. The circuit numbers are for reference only. The Contractor shall examine panels before and after demolition and shall provide new breakers as required or may re-use existing spare breakers.

C. The contractor shall re-label existing panels correctly and provide typed circuit directory. Test each existing circuit to verify items served. Contractor shall also test existing mains and shall verify that existing feeders are not overloaded.

OWNER TESTS AND INSPECTIONS

A. The owner reserves the right to inspect and test any portion of the equipment during the progress of its erection. The Contractor shall afford the Owner or Owner's representative every facility for evaluating the skill and competence of the mechanics and to examine the materials and installation. Concealed work shall be reopened when so directed during his periodic visits.

B. The contractor shall notify the Architect or Engineer before any electrical work is concealed by a concrete pour, covering of a wall or installation of a ceiling. This notification shall be received from the Contractor at least 72 hours prior to concealment.

C. The Electrical Contractor shall test the entire system in the presence of the Owner or his representative when the work is finally completed to ensure that all portions are free from short circuits and grounds are in good, intended working condition. Power for final tests after all erections are completed will be furnished by the Owner. All equipment necessary to conduct the above tests shall be furnished by the Owner. All equipment necessary to conduct the above tests shall be furnished at the expense of the Electrical Contractor.

INSPECTION, TESTING AND START-UP

A. Scope:

1. Intent: The intent of the inspection, testing and check-out work specified herein, or required, is to ensure that all electrical workmanship and equipment, whether Owner furnished or Contractor furnished, is installed and performs in accordance with the design specifications, drawings, manufacturer's instructions and all applicable codes and requirements. Also, it is intended to provide, insure or to determine the following:
   a. If the equipment or installation has been subjected to damage during shipment or installation.
   b. If the equipment is in accordance with the purchase orders and specifications.
   c. Provide initial acceptance tests and recorded data that can be used as a benchmark for future routine maintenance and troubleshooting by Owner's maintenance forces.
   d. Insure a successful start-up with a minimum of last-minute interruptions and problems.
   e. Determine the suitability of the equipment and systems for energization and placing into operating service.
   f. Provide assurance that each system component is not only installed satisfactorily but performs, and will continue to perform, its function in the system with reasonable reliability throughout the life of the project.
2. Contractor Responsibility: The contractor shall provide all necessary labor, materials, tools, test instruments or other equipment or service and expenses required to inspect, test, adjust, set, calibrate, functionally and operationally check all work and components of the various electrical systems circuitry shall include the installation.

CHARACTER OF MATERIALS AND EQUIPMENT

A. All materials and equipment shall be new and conform to standards, specified herein, defined to include conduits, cable, wiring materials and devices, panelboards, etc.

B. All materials and equipment shall be of an approved design. Similar material shall be of one manufacturer wherever possible.

C. All equipment offered under these specifications shall be limited to products regularly produced and recommended for service ratings in accordance with manufacturer's catalogs, engineering data or other comprehensive literature made available to the public and in effect at the time of opening bids.

D. Equipment shall be installed in strict accordance with manufacturer's instructions for type, capacity and suitability of each piece of equipment used.

E. The Electrical Contractor shall obtain the instructions which shall be considered as a part of these specifications.

MANUFACTURER'S DRAWING

A. The Electrical Contractor shall submit to the Architect manufacturer's drawings of switchboards, lighting fixtures, switches, panelboards, dry-type transformers, emergency generator, fire alarm system equipment, and any special electrical equipment to be installed on this job, for the approval before ordering same for installation.

B. The Electrical Contractor shall be responsible for final coordination of all electrical feeders and over current protection devices (circuit breakers and/or fuses) with the manufacturers written data for each mechanical device prior to submittal of any electrical equipment for review. No additional compensation will be allowed for any changes to electrical feeders or over current protection devices required for any mechanical devices.

C. Failure of the subcontractor to submit shop drawings in ample time for checking shall not entitle him to an extension of contract time, and no claim for extension by reason of such default will be allowed.

AS-BUILT DRAWINGS

A. The construction drawings shall be revised during construction to indicate the "as-bult" condition. At the completion of the project, they shall serve as final "as-built" drawings. Submit to the Architect/Engineer the revised "as-built" drawings and one set of blueline prints.

STRUCTURAL DIFFICULTIES

A. Should any structural difficulties prevent setting of cabinets, running conductors, etc., at points shown on plans, the necessary minor deviations therefrom, as determined by the Architect, may be permitted and must be made without additional cost.

COOPERATION WITH OTHER CONTRACTORS

A. The Electrical Contractor shall arrange all parts of his work in proper relation to the work of others and to the architectural finish.

B. Where interferences occur, the Electrical Contractor shall, before installing the work involved, consult with the Architect to exact location and level of his work. The Architect's decision shall be final.

C. The Electrical Contractor shall be responsible for the arrangement of his work, and equipment and maintenance of proper headroom under his work. Should work installed by him require modification to avoid interference with other work, as determined by the General Contractor, such changes shall be made without additional cost. The General Contractor's decision as to determination of allocation of responsibility, where conditions require changing of work, shall be final.

D. If any work of the Electrical Contractor is dependent for its proper execution on continuous work not executed by him, the Electrical Contractor shall examine such work and report in writing any defects thereon or conditions rendering it unsuitable. The beginning of work, without making such report, shall constitute an acceptance of such work, and any defects in his own work consequently shall be his responsibility.

E. The Electrical Contractor shall provide the General Contractor with the locations and sizes of all electrical sleeve penetrations for the coordination sleeve shop drawing.

DRAWINGS & SPECIFICATIONS

A. The drawings are intended to show the general arrangement of outlets. Door swings shall be checked for final arrangement and switches installed on the knob side. The Electrical Contractor shall check all structural and mechanical plans and specifications so that he may coordinate his work with these trades.

B. All outlets shall be located uniformly with respect to beams, partitions, duct openings, etc., and the general locations shall be checked with the plans and specifications before installing. Should there be any interference between electrical outlets and other trades, the Electrical Contractor shall notify the Architect so that the proper location may be decided upon. No outlets shall be installed on back of ducts, grilles or inaccessible places.

CODES, PERMITS AND FEES

A. Obtain any pay for all permits, licenses, inspections, approvals and fees required and ensure that the entire electrical installation conforms to codes and regulations required by authority or agency having jurisdiction over the entire installation or construction of work included. All fees shall be included in the base proposal.

B. The Electrical Contractor shall, at his expense, have an inspection made by the local electrical inspection department of te complete electrical installation and shall deliver certificate of approval of the complete work to the Owner before receiving his final payment.

C. Whenever the requirements of these specifications be required to conform to these codes, ordinances, laws of regulations, notify the Architect-Engineer at time of submitting proposal. After entering into a contract, Contractor shall complete all work necessary to meet code, laws, regulations and ordinance requirements without extra expense to the Owner.

D. Should any change in the drawings and specifications be required to conform to these codes, ordinances, laws of regulations, notify the Architect-Engineer at time of submitting proposals. After entering into a contract, Contractor shall complete all work necessary to meet code, laws, regulations and ordinance requirements without extra expense to the Owner.

FLASHING

A. Where the work included under the following sections of the specifications requires conduit to pass through the roof or any other waterproofing, the conduit shall be flashed under the section concerned, and the joint made waterproof in full conformance with waterproofing warranty requirements.

PAINTING AND CLEANING

A. See "Finishing and Painting" in Architectural Specifications.

B. Electrical metal conduit installed in earth or below vapor barrier shall be given two coats of black asphlatum. Conduit embedded in concrete need not be painted.

C. Electrical luminate support systems shall be painted with two coats of paint to match fixture.

D. Factory finish as damaged shall be retouched or replaced to satisfaction of Architect and Owner.

SLEEVES

A. Sleeves

1. Conduits passing through masonry and concrete walls, high stress floor slabs and roof slabs, shall be provided with segments of steel pipe sleeves. Sleeves shall finish flush with top and bottom of slab.
2. Conduits passing through regular slab construction shall have sleeves of a minimum #26 gauge galvanized steel. Sleeves shall be flush with finished floor. In exposed areas the sleeve shall be steel pipe extended 1-inch above finished floor.
3. Sleeves in concrete slab or walls shall be fastened in place on forms before concrete is poured. If omitted prior to pour, cutting shall be done in accordance with "Cutting and Patching: paragraph.
4. Location of required openings shall be the responsibility of the Contractor installing conduit and appurtenances.

CUTTING AND PATCHING

A. Cutting and patching of walls, floors, ceiling, roofs, etc., shall be done at the expense of the Contractor installing equipment and appurtenances, subject to the approval of the Engineer and Architect. Contractor shall be careful to prevent injury, discoloration or defacement to finished materials and shall not fit or cut finished materials other than his own without specific instructions. Structural members shall not be cut without obtaining written permission.

B. Drilling and patching for expansion bolts, shields, hangers and other SUPPORTS shall be subject to approval of the Architect. Labor and materials required to replace or refinish parts cut or injured shall be done at the expense of the Contractor performing the work, subject to the Engineer's and Architect's approval.

C. Chases and grooves installed in walls and partitions shall be determined in advance of building construction.

D. Conduits passing through roofs or outside walls exposed to weather shall be carefully flashed and counter flashed.

E. Conduit in finished areas shall be concealed. Contractor shall notify Architect before installing exposed conduit, piping, etc.

F. Fire proofing of holes shall be provided and shall be of specified material, and approved by authority having jurisdiction.

CLEAN UP

A. The Contractor shall keep the premises free of debris and unusable materials resulting from his work and immediately upon completion of this work, he shall remove such debris and materials from the Owner's property and he shall leave all floors broom clean in areas affected by his work.

GROUNDING

A. Grounding path from circuits, equipment, and conductor enclosures shall be permanent and continuous; have capacity to conduct safely any fault currents likely to be imposed on it; and shall have a resistance to ground of less than 5 ohms.

B. All branch circuit conductors shall include a separate copper, insulated (green), equipment grounding conductor sized per Article 250 of the National Electrical Code.

C. Piping systems and exposed structural steel that may become energized shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to the one or more grounding electrodes used. Bonding shall be per NEC Art. 250.104.

PENETRATIONS AND FIRE PROOFING

A. All penetrations of rated fire and smoke walls shall be by conduit.

B. All penetrations of floors shall be by conduit or metal sleeves.

C. All penetration sleeves including open ended conduits not terminated in junction boxes shall be filled with Fire Safing Material as manufactured by U. S. GYPSUM CO., or Architect approved equal for 2" in length from conduit end.

FUSES

A. Tops of panels shall be located 6 feet above the floor, unless otherwise indicated.

B. Main Feeder and Branch Circuits:

1. Circuits 1 to 600 amperes shall be protected by U.L. Class "RK-1" current limiting fuses. Fuses shall be Dual Element, time-delay type and be listed by the Underwriters' Laboratories with an interrupting rating of 200,000 amperes RMS symmetrical.
   a. Acceptable Products:
      1) Bussmann Type "LPN-RK" (250 volts) or "LPS-Rk" (600 volts).
      2) Littlefuse Type "LLNRK" (250 volts) or "LLSRK" (600 volts).
      3) Reliance Type "LENRK" (250 volts) or "LESRK" (600 volts).
2. Motor Circuits: All individual motor circuits rated 460 volts or less shall be protected by U.L. Class "RK-1" current limiting, Dual Element, time-delay type fuses. The fuses for 1.15 service factor motors shall be installed in ratings approximately 125% of motor full load current. Under such conditions as high ambient temperatures or where a motor cannot be brought to speed quickly, fuses 150% or 200% of the motor full load current shall be used. Larger horsepower motors shall be protected by U.L. Class "L" on the plans or recommended by the equipment manufacturer.
   a. Acceptable Products:
      1) See "1." and "2." above.
3. A fuse identification label shall be placed inside each switch door. The label shall indicate fuse type, ampere rating and interrupting rating. A warning label shall be placed on the outside and inside of each switch door warning that the installation of another size or type fuse may cause a hazardous condition. The label requirements are in addition to the other labeling requirements in the specifications.

C. Spare: Upon completion of the project, the Contractor shall provide the Owner with spare sets of fuses equal to 10% (minimum of three) of each type and rating of installed fuses. Contractor shall provide spare fuse cabinet(s) located convenient to the main service equipment.

CONDUIT

A. General:

1. Minimum size conduit shall be 3/4", except switch legs and drops to individual light fixtures may be 1/2" conduit.
2. Install exposed conduit runs parallel to or at right angles with principal structural members and with adjacent walls.
3. Install vertical runs perpendicular to finish floors and ceilings.
4. Concealed runs may take most direct route between outlets.
5. Use plastic or metal cap closures during construction to prevent lodgment of plaster, dirt, concrete, or trash in conduit, boxes and fittings.
6. Fasten and support conduit at least every 10 ft. and within 3 ft. of outlet box, junction box, cabinet, or fitting.
7. Ream cut ends to remove rough edges.
8. Where conduit is threaded in field, use conduit thread cutting die with taper.
9. Run of conduit between outlet and outlet, fitting and fitting, or outlet and fitting shall not contain more than equivalent of three quarter bends (270 deg. total), including bends located immediately at outlet or fitting.
10. Conduit runs, including boxes, fittings, cabinet, and wireways, shall be electrically continuous throughout.
11. Install conduits entering boxes and cabinet with two locknuts, one inside and one outside, with bushing termination on inside.
12. Install conduit runs concealed within finished area.
13. Install conduit expansion fittings in runs which cross building expansion joints.
14. Fasten and support conduit with malleable iron or galvanized steel conduit straps.
    a. Attach hangers and SUPPORTS to dry wall construction with toggle bolts.
    b. Attach hangers and SUPPORTS to concrete or masonry construction with expansion shields and screws or bolts.
    c. Attach hangers and SUPPORTS to structural steel shapes with beam clamps and bolts.
15. Fasten and support group runs of raceways with prefabricated, noncorrosive, channel systems supported with threaded hanger rods.
16. Terminate conduit runs in main service switchboard with grounding type insulated bushings.
17. Where conduit runs pass through interior fire-rated partitions or above grade concrete floors, provide fireseal fittings.
18. Where conduit runs pass through interior non-rated partitions or above grade concrete floors, install conduit in galvanized steel conduit sleeves.
19. Seal void between sleeve and conduit with approved fire proofing compound.
20. Unless specifically indicated otherwise on the Electrical Drawings, no conduit shall be run in the concrete slab. Where conduit is indicated on the Electrical Drawings, and where conduit are to collect at a panel or similar point, the Contractor must advise the Structural Engineer and obtain his approval for the number of conduit and method of installation.

B. Rigid Steel and Intermediate Metal Conduit:

1. Install rigid steel or intermediate metal conduit when used as follows:
   a. Conduit runs larger than 4".
   b. Exposed interior runs in mechanical spaces below 8 feet.
   c. Runs installed in and below equipment concrete floor slabs.
   d. Exposed exterior runs.
   e. For runs where installation is subject to physical damage during construction or afterwards.
2. Where conduit is installed in poured concrete floors with turn out of floor, conceal radius bend completely within floor with only vertical run exposed.
3. Fitting shall be galvanized threaded type.

C. Electrical Metallic Tubing (EMT):

1. Install EMT when used for lighting, receptacle, appliance branch circuit wiring, auxiliary systems wiring, and HVAC control wiring concealed above furred ceilings and in partitions within finished areas.
2. EMT conduit may also be used for feeders run through the building.
3. Do not install EMT where during installation or afterwards, it will be subject to physical damage.
4. Do not install EMT in the parking garage.
5. Do not install EMT in building slabs or encased in concrete.
6. Fittings shall be steel, compression type.

D. Rigid Non-Metallic Conduit:

1. Rigid non-metallic conduit shall be Schedule 40, heavy wall type, polyvinyl chloride.
2. Fittings shall be polyvinyl chloride for use with heavy wall type Schedule 40 PVC conduit.
3. Install rigid non-metallic conduit as follows:
   a. For below grade exterior conduit runs.
   b. For runs installed in and below building slabs.
      1) Turn ups including elbows and risers above grade shall be rigid steel or intermediate metal conduit.
      2) Install rigid non-metallic conduit to rigid steel conduit adapters for transitions to rigid steel conduit.
   c. For ducts in concrete encased ductbanks.
4. Field bends shall be made in accordance with manufacturer's recommendations using equipment specifically intended for use with rigid non-metallic conduit.
5. Make conduit joints and connections watertight with use of solvent cement as recommended by conduit manufacturer.

E. Flexible Metal Conduit:

1. Install 18 inch minimum length as final conduit connection to motors, rotating, and vibrating machinery and equipment, and dry type transformers.
2. Install separate grounding conductor in each length of flexible conduit and provide bonding at each end.
3. Fittings shall be squeeze type, malleable iron.

F. Flexible Metal Tubing:

1. Flexible metal tubing (FMT) may be used in 6 foot maximum length as final conduit connection to recessed lighting fixtures in plenums and furred spaces which are not subject to physical damage.
2. Install 4 foot minimum length as final conduit connection to recessed lighting fixtures in plenums and furred spaces which are not subject to physical damage.
3. Fittings shall be case machined type.

G. Liquidtite Flexible Conduit:

1. Install in place of flexible metal conduit in wet locations or where subject to oil, gasoline, or other materials having a deteriorating effect on rubber.
2. Install separate grounding conductor on outside of flexible conduit and fitting to provide bonding as required.
3. Fittings shall be steel or malleable iron with external grounding lug.

H. Aluminum Conduit:

1. The use of aluminum conduit shall not be allowed.

I. Underground Conduit Runs:

1. Construct conduit runs on thoroughly compacted earth and compacted backfill.
2. Slope conduits toward each end.
3. Space conduit accurately with plastic or precast concrete spacers held firmly in place.
4. Coat male threads of metal conduit with white lead prior to assembly.
5. Rod and draw mandrel through conduit; follow by swab to clear obstruction which may cause abrasions.

J. Conduit Expansion Fittings:

1. Install as required.
2. Install copper bonding jumper with each expansion fitting.

SUPPORTING DEVICES

A. Types of supports, anchors, sleeves and seals specified in this section include the following:

1. Clevis hangers
2. C-clamps
3. I-beam clamps
4. Conduit straps
5. Round steel rods
6. Lead expansion anchors
7. Toggle bolts
8. Wall and floor seals
9. Power-driven threaded studs

B. Codes and Standards

1. Methods of installation shall comply with the provisions of applicable sections of the latest editions of the National Electrical Code, the State of Michigan Building Code, the State of Michigan Electrical Code, the International Building Code, and the ICC Electrical Code, as applicable to construction and installation of electrical supporting devices.
2. Compliance: Comply with applicable MSS standard requirements, National Electrical Contractors Association's "Standard of Installation", UL, and Federal Specification FF-S-760.

C. Provide supporting devices which comply with manufacturer's standard materials, design and construction in accordance with published product information, and as required for complete installation.

1. Supports: Provide supporting devices of types, sizes and materials indicated; and having the following construction features:
2. Clevis Hangers: For supporting 2" rigid metal conduit; galvanized steel; with 2" dia. hole for round steel rod; approximately 54 pounds per 100 units.
3. Reducing Couplings: Steel rod reducing coupling, 2" x 5/8"; black steel; approximately 16 pounds per 100 units.
4. C-Clamps: Black malleable iron; 2" rod size; approximately 70 pounds per 100 units.
5. I-Beam Clamps: Black steel, 1-1/4" x 3/16" stock; 3/8" cross bolt; flange width 2"; approximately 52 pounds per 100 units.
6. One-Hole Conduit Straps: For supporting 3/4" rigid metal conduit; galvanized steel; approximately 7 pounds per 100 units.
7. Two-Hole Conduit Straps: For supporting 3/4" rigid metal conduit, galvanized steel; 3/4" strap width; and 2-1/8" between center of screw holes.
8. Hexagon Nuts: For 2" rod size; galvanized steel; approximately 4 pounds per 100 units.
9. Round Steel Rod: Black steel; 2" dia.; approximately 67 pounds per 100 feet.
10. Offset Conduit Clamps: For supporting 2" rigid metal conduit; black steel; approximately 200 pounds per 100 units.
11. Anchors: Provide anchors of types, sizes and materials indicated, with the following construction features:
    a. Lead Expansion Anchors: 2"; approximately 38 pounds per 100 units.
    b. Toggle Bolts: Springhead; 3/16" x 4"; approximately 5 pounds per 100 units.
    c. Power-driven threaded studs: Heat-treated steel, designed specifically for the intended service.
    d. Manufacturers: Subject to compliance with requirements, provide anchors of one of the following:
       1) Abbeon Cal Inc.
       2) Ackerman Johnson Fastening Systems Inc.
       3) Elcen Metal Products Co.
       4) Hilti Manufacturing
       5) Ideal Industries, Inc.
12. Sleeves and Seals: Provide sleeves and seals, of types, sizes and materials indicated; with the following construction features:
    a. Conduit Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit, or tubing passing through concrete floors and walls.
    b. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.
13. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Provide plugs with number and size of conductor gripping holes as required to suit individual risers. Construct body of malleable-iron casting with hot-dip galvanized finish.
14. U-Channel Strut Systems:
    a. Provide U-channel strut system for supporting electrical equipment, 12-gauge hot-dip galvanized steel, of types and sizes indicated; construct with 9/16" dia. holes, 8" o.c. on top surface, with standard green finish, and with the following fittings which mate and match with U-channel:
       1) Fixture hangers
       2) Channel hangers
       3) End caps
       4) Beam clamps
       5) Wiring studs
       6) Thin wall conduit clamps
       7) Rigid conduit clamps
       8) Conduit hangers
       9) U-bolts
    b. Available Manufacturers: Subject to compliance with requirements, manufacturers offering channel systems which may be incorporated in the work include, but are not limited to, the following:
       1) Allied Tube and Conduit Corp.
       2) B-Line Systems, Inc.
       3) Elcen Metal Products Co.
       4) Greenfield Mfg Co., Inc.
       5) Midland-Ross Corp.
15. Fabricated Supporting Devices:
    a. Pipe Sleeves: Provide pipe sleeves of one of the following:
       1) Sheet-Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate sleeves from the following gauge metal: 3" and smaller, 20-gauge; 4" to 6", 16-gauge; over 6", 14-gauge.
       2) Steel-Pipe: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.
       3) Iron-Pipe: Fabricate from cast-iron or ductile-iron pipe; remove burrs.
       4) Plastic-Pipe: Fabricate from Schedule 80 PVC plastic pipe; remove burrs.
    b. Sleeve Seals: Provide sleeve seals for piping which penetrates foundation walls below grade, or exterior walls. Calk between sleeve and pipe with non-toxic, UL-classified caulking material to ensure watertight seal.

D. Installation of Supporting Devices:

1. Install hangers, anchors, sleeves and seals as indicated, in accordance with manufacturer's written instructions and with recognized industry practices to ensure supporting devices comply with requirements. Comply with requirements of NECA and NEC for installation of supporting devices.
2. Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.
3. Install hangers, supports, clamps and attachments to support piping properly from building structure. Arrange for grouping of parallel runs of horizontal conduits to be supported together on trapeze type hangers where possible. Install supports with spacings indicated and in compliance with NEC requirements.
4. Torque sleeve seal nuts, complying with manufacturer's recommended values. Ensure that sealing grommets expand to form watertight seal.

ELECTRICAL IDENTIFICATION

A. General

1. Materials and methods of installation shall comply with the provisions of applicable sections of latest editions of the National Electrical Code, the State of Michigan Electrical Code, the International Building Code, and the ICC Electrical Code as applicable to installation of identifying labels and markers for wiring and equipment.
2. UL Compliance: Comply with applicable requirements of UL Std 969, "Marking and Labeling Systems", pertaining to electrical identification systems.
3. ANSI Compliance: Comply with applicable requirements of ANSI Std A13.1, "Scheme for the identification of Piping Systems".
4. NEMA Compliance: Comply with applicable requirements of NEMA Std No's. WC-1 and WC-2 pertaining to identification of power and control conductors.

B. Lettering and Graphics:

1. General: Coordinate names, abbreviations and other designations used in electrical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturer or as required for proper identification and operation/maintenance of electrical systems and equipment. Comply with ANSI A13.1 pertaining to minimum sizes for letters and numbers.

C. General Installation Requirements:

1. Install electrical identification products as indicated, in accordance with manufacturer's written instructions, and requirements of NEC.
2. Coordination: Where identification is to be applied to surfaces which require finish, install identification after completion of painting.
3. Regulations: Comply with governing regulations and requests of governing authorities for identification after completing of painting.

D. Conduit Identification:

1. Underground Conduit and Cable Identification:
   a. General: During back-filling/top-soiling of each exterior underground electrical conduit, and signal or communication cable, install continuous underground-type plastic line marker, located directly over buried lines at 6" to 8" below finish grade. Where multiple lines are buried in a common trench and do not exceed an overall width of 12", install a single line marker.
   b. Install line marker for every buried service, regardless of whether direct-buried or protected in conduit.

WIRE AND CABLE (600 Volts)

A. All wiring shall be run in conduit.

B. Wire shall be as manufactured by Anaconda, Walker, General Cable, or Southwire, and shall be copper, minimum conductivity of 98 percent.

C. Feeders and branch circuit wiring shall be 600 volt rated, 75 deg. C insulated type XHHW, THW or THWN.

D. Conductors installed in runs within 6 inches of heating pipes shall be type AVA. No conductors shall be drawn into conduit until all work which may cause cable damage is completed.

E. No wiring smaller than No. 12 AWG gauge shall be used unless otherwise noted, and all wire No. 10 AWG gauge and larger shall be stranded, unless otherwise specified.

F. Home runs to panelboards 75 feet in length or over shall be not less than No. 10 AWG gauge, whether shown or not shown on the drawings.

G. Conductors shall be color coded per the National Electrical Code.

H. All conductors shall be copper.

CABLE SUPPORTS AND BOXES

A. The Electrical Contractor shall install cable supports and boxes for all vertical feeders in accordance with the schedule in the current edition of the National Electrical Code. The cable supports shall be of the split wedge type which clamps each individual conductor firmly and tightens due to weight of cable.

OUTLET BOXES

A. Outlets boxes shall be zinc-coated and shall be of the size and type to accommodate:

1. Structural conditions
2. Size and number of conductors and conduit entering
3. Devices or fixtures for which required.

B. Outlet boxes shall be firmly anchored in place and shall be provided with approved fixture supports. Outlet boxes for switches, convenience outlets, etc., shall be set flush with finished walls.

C. Outlet boxes shall be not less than 1-1/2 inches deep unless shallower boxes are required by structural conditions. Ceiling and bracket boxes shall be not less than 4 inch octagonal except that smaller boxes may be used where required by the particular fixture installed. Flush or recessed fixtures shall be provided with separate junction boxes when required by the fixture terminal requirements. Switch and receptacle boxes shall be approximately 4 inches. Telephone outlet boxes shall be 4 inches square.

WIRING DEVICES

A. Switches shall be 20 amperes, 277/120 volts. They shall be single pole, three-way or four-way as required. Switches shall be equal to Hubbell 1221, 1223 or 1224.

B. General use receptacles shall be specification grade, duplex type with the mechanism enclosed in a cup body, rated 20 amperes, 125 volt. Receptacles shall be equal to Hubbell 5362.

C. Ground fault receptacles shall be specification grade, duplex type, rated 20 ampere, 125 volt, UL listed under 498 Receptacle Requirements and 943 Class A Requirements, shall conform to NEC requirements, and equal to Hubbell series #5260, P&S, or Arrow-Hart.

D. Device colors shall be as selected by Architect.

WEATHERPROOF BOXES AND COVERS:

A. Wiring devices installed at exterior locations shall be weather-resistant and installed in a single gang, deep weatherproof box with while-in-use cover per NEC section 406.8(b)(1). Boxes and covers shall be constructed of polycarbonate and shall be fully gasketed. The translucent cover shall include a pad-lockable, break-resistant bullnose and latch. Pass & Seymour #WIUC10-DC of equal.

DEVICE PLATES

A. Device plates shall be stainless steel type 302. Hubbell "S" series, or as selected by the Architect or Owner.

CONNECTION OF MECHANICAL EQUIPMENT

A. The Electrical Contractor is cautioned to note carefully other sections of these specifications describing electrical equipment to be furnished under those sections in order that he may fully understand the wiring requirements.

B. The Electrical Contractor shall be responsible for final coordination of all electrical feeders and over current protection devices (circuit breakers and/or fuses) with the manufacturers written data for each mechanical device prior to submittal of any electrical equipment for review. No additional compensation will be allowed for any changes to electrical feeders or over current protection devices required for any mechanical devices.

C. All power wiring and feeders for mechanical equipment shall be furnished and installed by the Electrical Contractor.

D. Safety or disconnect switches where indicated or required shall be furnished and installed by the Electrical Contractor.

SAFETY DISCONNECT SWITCHES

A. Switches shall be quick-make, quick-break type, horsepower rated. All switches shall be NEMA type HD (heavy duty).

B. In-door enclosures shall be NEMA I, indoor; outdoor enclosures shall be NEMA 3R, raintight.

C. Equip fusible switches with Class R, rejection type fuse clips.

D. Safety disconnect switches shall be manufactured by: Square D Company, General Electric, Siemens Energy & Automation, or Cutler-Hammer.

GUARANTEE

A. The Electrical Contractor shall leave the electrical installation in proper working order and shall, without charge, replace any work or materials which develop defects, within one (1) year from date of final inspection and acceptance by the Owner.

STATE OF MICHIGAN
JORDAN KOENIG
ENGINEER
No. 6201059789
LICENSED PROFESSIONAL ENGINEER
10/20/26

MEEC JOB # 26-0196

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ELECTRICAL SPECIFICATIONS

SCALE: NONE

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BIDS & PERMITS
issued for

10.20.2026
date

dr: Z.M.
ck'd: Z.M.
app'd: J.K.

SECONDARY WELL for:
BRIGHTON AREA SCHOOLS
(HILTON ELEMENTARY)
BRIGHTON, MICHIGAN
ELECTRICAL SPECIFICATIONS

E2.1

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