

## GENERAL ELECTRICAL NOTES

1. CONTRACTOR SHALL SURVEY JOB SITE CONDITIONS DURING THE BIDDING PERIOD TO UNDERSTAND THE SCOPE OF ELECTRICAL WORK INVOLVED. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS WHICH MUST BE INSTALLED, ROUTED, RELOCATED, OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED SO THAT THE INDICATED WORK MAY BE ACCOMPLISHED.
2. REFER TO ARCHITECTURAL/INTERIOR DRAWINGS FOR EXACT LOCATIONS OF LIGHTING FIXTURES AND OUTLETS. ALL WALL POWER AND TELEPHONE OUTLETS SHALL BE MOUNTED AT 18" A.F.F. AND ALL LIGHT AND DIMMER SWITCHES SHALL BE MOUNTED AT 48" A.F.F. EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE ON THE PLANS. DIMENSIONS NOTED ON ARCHITECTURAL/INTERIOR DESIGNER'S DRAWINGS SHALL PREVAIL.
3. CONTRACTOR SHALL PROVIDE, INSTALL AND CONNECT NEW BATTERY BACK-UP (MINIMUM 1100 LUMEN) FOR FIXTURES INDICATED TO HAVE BATTERY BACKUP FOR EMERGENCY LIGHTING, MINIMUM 1.5 HR. OF BACK-UP. PROVIDE NEW BATTERY PACKS IN EXISTING FIXTURES WHERE REQUIRED. (TYPICAL FOR ALL NON-GENERATOR BACK-UP SYSTEMS.)
4. CONTRACTOR MAY COMBINE WIRES IN ONE CONDUIT FOR CONVENIENCE OF INSTALLATION, PROVIDED ALL THE REQUIREMENTS OF THE N.E.C. ARE OBSERVED.
5. ALL ELECTRICAL EQUIPMENT IS SHOWN DIAGRAMMATICALLY. EXACT LOCATIONS ARE TO BE DETERMINED IN THE FIELD AVOIDING INTERFERENCES.
6. THE INSTALLATION SHALL COMPLY WITH SPECIFICATIONS AND ALL REQUIREMENTS OF THE LATEST ADOPTED EDITION OF THE N.E.C., OSHA, STATE, AND LOCAL CODES.
  - NFPA 70 NATIONAL ELECTRIC CODE
  - NFPA 72 FIRE ALARM
  - OHIO BUILDING CODE
  - INTERNATIONAL ENERGY CONSERVATION CODE
7. ALL WIRE, CONDUIT AND BREAKERS SHALL BE #12 COPPER WIRE (THHN OR THWN), 1/2" CONDUIT AND 20 AMP SINGLE POLE BREAKERS UNLESS OTHERWISE NOTED. (TYPICAL)
8. WHEN BRANCH CIRCUIT LENGTH EXCEEDS 75 FEET FROM PANEL, WIRING SHALL BE INCREASED TO #10 AWG. WHEN BRANCH CIRCUIT LENGTH EXCEEDS 150 FEET FROM PANEL, BRANCH WIRING SHALL BE INCREASED TO #8 AWG WITH #10 AWG GROUND.
9. PROVIDE A GROUND BAR WITH #6 COPPER GROUND TO BUILDING GROUNDING POINT FOR EACH TELEPHONE BACKBOARD.
10. PROVIDE GROUND CONDUCTOR IN ALL RACEWAYS.
11. NEW OUTLETS ON OPPOSITE SIDE OF WALL SHALL BE STAGGERED BY A MINIMUM OF ONE STUD FOR SOUND ATTENUATION.
12. CONTRACTOR SHALL UPDATE PANEL DIRECTORY AS PER WIRING IN FIELD.
13. ALL CIRCUIT BREAKERS FOR MECHANICAL EQUIPMENT SHALL BE HACR RATED.
14. ALL COMMUNICATION OUTLETS AND CABLING TO BE PROVIDED AND INSTALLED BY OTHERS. CONTRACTOR TO PROVIDE AND INSTALL JUNCTION BOXES AND 1" CONDUITS WITH BLANK COVER PLATES, U.N.O.

## SYMBOLS LEGEND

(NOT ALL SYMBOLS WILL BE USED)

### LIGHTING FIXTURE SYMBOLS

- UPPER CASE LETTER DENOTES FIXTURE TYPE  
LOWER CASE LETTER DENOTES CONTROL DESIGNATION
- FLUORESCENT STRIP FIXTURE (LENGTH AS INDICATED)
  - LIGHTING FIXTURE ON EMERGENCY CIRCUIT
  - LAY-IN OR SURFACE LIGHTING FIXTURE (SIZE AS INDICATED)
  - RECESSED CEILING (AS SCHEDULED)
  - WALL MOUNTED FIXTURE
  - BATTERY POWERED EMERGENCY LIGHTING UNIT
  - EXIT SIGN - SHADED AREAS INDICATE ILLUMINATED FACES - PROVIDE DIRECTIONAL ARROWS AS INDICATED AND EMER. LIGHTING HEADS AS INDICATED (VERIFY MOUNTING)

### CONTROL DEVICE SYMBOLS

- LOWER CASE LETTER DENOTES CONTROL DESIGNATION  
(SWITCHES FLUSH MOUNTED @+48" AFF, UNO)
- S SINGLE POLE SWITCH
  - S<sub>3</sub> 3-WAY SWITCH
  - S<sub>D</sub> DIMMER SWITCH
  - S<sub>OS</sub> OCCUPANCY SENSOR WALL SWITCH
  - S<sub>M</sub> MOTOR RATED SWITCH
  - ⊕ OCCUPANCY SENSOR
  - ⊖ THERMOSTAT
  - ⊙ CONTROL STATION

### RECEPTACLE SYMBOLS

- (FLUSH MOUNTED @+18" AFF, UNO)  
(RECEPTACLES WITH A "C" MOUNTED ABOVE COUNTER)
- ⊕ SINGLE RECEPTACLE
  - ⊕ DUPLEX RECEPTACLE - "D" INDICATES DEDICATED, "C" INDICATES ABOVE COUNTER, "S" INDICATES CHILD SAFE
  - ⊕ DUPLEX RECEPTACLE - FLOOR MOUNTED
  - ⊕ ISOLATED GROUND DUPLEX RECEPTACLE (ORANGE, UNO)
  - ⊕ DOUBLE DUPLEX (QUAD) RECEPTACLE
  - ⊕ SPECIAL PURPOSE RECEPTACLE (TYPE AS NOTED)
  - ⊕ GFCI DUPLEX RECEPTACLE
  - ⊕ DUPLEX RECEPTACLE - SWITCHED
  - ⊕ MULTI-OUTLET ASSEMBLY
  - PP POWER POLE

### COMMUNICATION SYMBOLS

- TELEPHONE TERMINAL BOARD - 4" X 4" X 3/4" FIRE RATED PLYWOOD, AND GROUND BAR, UNO
- TELECOMMUNICATIONS OUTLET MOUNTED @ 18" AFF, WITH 1" CONDUIT AND PULL STRING, ROUTED UP TO ACCESSIBLE CEILING SPACE.
- FLOOR MOUNTED TELECOMMUNICATIONS OUTLET
- TELEVISION OUTLET, WITH 1" CONDUIT AND PULL STRING ROUTED UP TO ACCESSIBLE CEILING SPACE
- FIXED CAMERA, PROVIDE J-BOX WITH 1" CONDUIT TO ACCESSIBLE CEILING SPACE
- SPEAKER - CEILING MOUNTED, UNO
- CARD READER, WITH 1" CONDUIT AND PULL STRING ROUTED UP TO ACCESSIBLE CEILING SPACE, AND 3/4" CONDUIT ROUTED TO DOOR HARDWARE AS REQ'D.

### POWER DISTRIBUTION SYSTEM SYMBOLS

- PANELBOARD - SURFACE MOUNTED
- PANELBOARD - FLUSH MOUNTED
- TRANSFORMER
- MOTOR
- ENCLOSED MOTOR CONTROLLER/STARTER
- COMBINATION ENCLOSED MOTOR CONTROLLER/ STARTER/DISCONNECT SWITCH
- NON-FUSED DISCONNECT SWITCH (30A/2P OR 3P, UNO)
- FUSED DISCONNECT SWITCH (30A/2P OR 3P, UNO)
- CONTACTOR
- ENCLOSED CIRCUIT BREAKER
- RELAY
- JUNCTION BOX
- PULLBOX

### FIRE ALARM SYMBOLS

- FACP FIRE ALARM CONTROL PANEL
- FAAP FIRE ALARM REMOTE ANNUNCIATOR
- ⊕ AREA SMOKE DETECTOR
- ⊕ DUCT SMOKE DETECTOR
- ⊕ HEAT DETECTOR
- ⊕ FIRE ALARM PULL STATION
- ⊕ FIRE ALARM VISUAL DEVICE (STROBE)
- ⊕ FIRE ALARM AUDIBLE VISUAL DEVICE (HORN/STROBE)
- FSD FIRE SMOKE DAMPER
- DH DOOR HOLDER
- FS FLOW SWITCH
- TS TAMPER SWITCH

### SINGLE LINE DIAGRAM SYMBOLS

- ⊕ CIRCUIT BREAKER
- M METERING - PER LOCAL UTILITY REQUIREMENTS
- X FEEDER SCHEDULE CALLOUT

### ANNOTATIONS

- X KEYED NOTE
- X REVISION SYMBOL
- AHU-1 MECHANICAL EQUIPMENT CALLOUT

### RACEWAY SYMBOLS

- 1/2" EXPOSED CONDUIT WITH (3) #12 WIRES, UNO (4) #12 WIRES FOR 3Ø CIRCUITS)
- 1/2" CONCEALED CONDUIT WITH (3) #12 WIRES, UNO (4) #12 WIRES FOR 3Ø CIRCUITS)
- CONDUIT UNDERGROUND OR BELOW GRADE
- CONDUIT HOME RUN
- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUIT STUBBED AND CAPPED
- CONDUIT WITH SEAL-OFF
- GROUND CONNECTION
- GROUND ROD

## ABBREVIATIONS

DESCRIPTION	ABBREVIATION	DESCRIPTION	ABBREVIATION
A, AMP	AMPERE	KVA	KILOVOLT AMPERE KVAR KILOVOLT AMPERE REACTIVE
AFF	ABOVE FINISHED FLOOR	KW	KILOWATT
AFG	ABOVE FINISHED GRADE	KWH	KILOWATT HOUR
AHJ	AUTHORITY HAVING JURISDICTION	MCB	MAIN CIRCUIT BREAKER
AIC	AMPERE INTERRUPTING CAPACITY	MLO	MAIN LUGS ONLY
AL	ALUMINUM	NEC	NATIONAL ELECTRICAL CODE
ATS	AUTOMATIC TRANSFER SWITCH	NECA	NATIONAL ELECTRICAL CONTRACTOR'S ASSOCIATION
AWG	AMERICAN WIRE GAUGE	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
C	CONDUIT/ABOVE COUNTER	NFC	NATIONAL FIRE CODE
CB	CIRCUIT BREAKER	NC	NORMALLY CLOSED
CCTV	CLOSED CIRCUIT TELEVISION	NIC	NOT IN CONTRACT
CKT	CIRCUIT	NO	NORMALLY OPEN
CO	CONDUIT ONLY	NTS	NOT TO SCALE
CT	CURRENT TRANSFORMER	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
CU	COPPER	PF	POWER FACTOR
CW	COLD WATER	Ø, PH	PHASE
DEMO	DEMOLITION/DEMOLISH	PNL	RIGID GALVANIZED STEEL CONDUIT
DISC	DISCONNECT	RGS	RIGID GALVANIZED STEEL CONDUIT
EC	ELECTRICAL CONTRACTOR	SPD	SURGE PROTECTION DEVICE
EGC	EQUIPMENT GROUNDING CONDUCTOR	SW	SWITCH
ELEV	ELEVATOR	TEL	TELEPHONE
EM, EMER	EMERGENCY	XFMR	TRANSFORMER
EMT	ELECTRICAL METALLIC TUBING	T-STAT	THERMOSTAT
FBO	FURNISHED BY OTHERS	TTB	TELEPHONE TERMINAL BOARD
GFI	GROUND FAULT CIRCUIT INTERRUPTER	TYP	TYPICAL
GND	GROUND	UL	UNDERWRITER'S LABORATORY
HP	HORSEPOWER	UNO	UNLESS NOTED OTHERWISE
IMC	INTERMEDIATE METALLIC CONDUIT	V	VOLT OR VOLTAGE
ISC	SHORT CIRCUIT AMPERES, KA	VA	VOLT AMPERE
IG	ISOLATED GROUND	VFD	VARIABLE FREQUENCY DRIVE
J-BOX	JUNCTION BOX	W	WATT
kcmil	THOUSAND CIRCULAR MILS	WA P	WIRELESS ACCESS POINT
KV	KILOVOLT	WP	WEATHERPROOF



**FRED FRIAR, P.E.**  
CONSULTING ENGINEER

5732 ROUTE 152, LAVALETTE, WV 25535  
(304) 962-7006 | FRED@FRIARPE.COM

REV.	DESCRIPTION	DATE
06-02-21	REVIEW SET	
06-02-21	PRICING SET	

**SPEC 13 COMMERCE DRIVE**  
**LAWRENCE ECONOMIC DEVELOPMENT CORP.**

**NOTES AND SYMBOLS**

DRAWN BY: F. FRIAR  
CHECKED BY: F. FRIAR  
DATE: 06-02-21

# ELECTRICAL SPECIFICATIONS

## BASIC ELECTRICAL REQUIREMENTS

### A. GENERAL NOTES

1. THE CONTRACTOR FOR THIS DIVISION OF WORK IS REQUIRED TO READ THE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL DIVISIONS OF WORK AND IS RESPONSIBLE FOR THE COORDINATION OF HIS WORK AND THE WORK OF HIS SUBCONTRACTORS WITH ALL DIVISIONS OF WORK. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO PROVIDE HIS SUBCONTRACTORS WITH A COMPLETE SET OF BID DOCUMENTS.

2. THIS CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THE COMPLETION AND INSPECTION OF HIS WORK AND THE WORK OF HIS SUBCONTRACTORS WORK TO COMPLY WITH THE SCHEDULE AND THE PROJECT COMPLETION DATE.

### B. GENERAL REQUIREMENTS

1. CONTRACTOR SHALL PROVIDE ALL INSURANCE, LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INCIDENTALS, AND DETAILS NECESSARY TO PROVIDE A COMPLETE ELECTRICAL SYSTEM AS INTENDED ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS. CLOSELY COORDINATE THE ENTIRE INSTALLATION WITH THE CONSTRUCTION MANAGER, AS REQUIRED.

2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE FURNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK, AND WHICH IS USUALLY INCLUDED IN WORK OF SIMILAR CHARACTER, SHALL BE FURNISHED AND INSTALLED AS PART OF CONTRACT.

3. WHERE THE DRAWINGS OR SPECIFICATIONS CALL FOR ITEMS WHICH EXCEED CODES, THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING THE SYSTEM WITH THE MORE STRINGENT REQUIREMENTS AS DESIGNED AND DESCRIBED ON THESE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.

4. ALL ELECTRICAL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING, AND REPAIRING. THIS CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT SERVICE ACCESS TO ALL EQUIPMENT.

5. ALL WORK SHALL BE PERFORMED IN A NEAT PROFESSIONAL MANNER INCORPORATING GOOD ENGINEERING PRACTICES.

6. UNLESS SPECIFICALLY NOTED OTHERWISE, MATERIALS, PRODUCTS, AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW, UNDERWRITERS LABORATORIES LISTED AND LABELED AND SIZED IN CONFORMITY WITH REQUIREMENTS OF STATE AND LOCAL CODES, WHICHEVER IS MORE STRINGENT.

### C. CODES

1. ALL WORK SHALL CONFORM TO STATE, COUNTY, CITY, AND LOCAL CODES AND ORDINANCES, SAFETY AND HEALTH CODES, NFPA CODES, NEC, ENERGY CODES, AND ALL OTHER APPLICABLE CODES AND REQUIREMENTS. THIS CONTRACTOR SHALL INQUIRE INTO AND COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS. THIS CONTRACTOR SHALL INCLUDE ANY CHANGES REQUIRED BY CODES IN THE BID AND IF THESE CHANGES ARE NOT INCLUDED IN THE BID, THEY MUST BE QUALIFIED AS A SEPARATE LINE ITEM IN THE BID.

### D. LICENSES, PERMITS, INSPECTIONS & FEES

1. THIS CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS, AND FEES REQUIRED OR RELATED TO HIS WORK.

2. FURNISH TO THE CONSTRUCTION MANAGER ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT COMPLETION OF PROJECT.

### E. TRADE NAMES, MANUFACTURERS, AND SHOP DRAWINGS

1. WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM FOR THE BASE BID. MANUFACTURERS CONSIDERED AS AN EQUAL OR BETTER IN ALL ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO APPROVAL IN WRITING BY THE ENGINEER PRIOR TO THE SHOP DRAWING SUBMITTAL PROCESS, FOR ACCEPTANCE. THE USE OF ANY UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

2. CONTRACTOR SHALL SUBMIT SUBSTITUTION REQUESTS TO THE ENGINEER FOR APPROVAL. SUBMISSIONS SHALL BE MADE EARLY ENOUGH IN PROJECT TO ALLOW FOUR (4) WORKING DAYS FOR THE ENGINEER'S REVIEW WITHOUT CAUSING DELAYS OR CONFLICTS TO THE JOB'S PROGRESS. SUBMITTALS SHALL BEAR THE STAMP OF THE CONTRACTOR AND THE SUB-CONTRACTOR SHOWING THAT HE HAS REVIEWED AND CONFIRMED THAT THE SUBMITTALS ARE IN CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS OR INDICATE WHERE EXCEPTIONS HAVE BEEN TAKEN.

### F. GUARANTEE

1. THIS CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORK PROVIDED UNDER HIS CONTRACT AND SHALL MAKE GOOD, REPAIR, OR REPLACE AT HIS OWN EXPENSE, ANY DEFECTIVE WORK, MATERIAL, OR EQUIPMENT WHICH MAY BE DISCOVERED WITHIN A PERIOD OF 12 MONTHS FROM THE DATE OF ACCEPTANCE (IN WRITING) OF THE INSTALLATION. EXTENDED WARRANTIES ARE AS SPECIFIED WITH INDIVIDUAL EQUIPMENT.

### G. RECORD DRAWINGS

1. THIS CONTRACTOR SHALL MAINTAIN ONE COPY OF DRAWINGS ON THE JOB SITE TO RECORD DEVIATIONS FROM CONTRACT DRAWINGS.

2. AT COMPLETION OF THE PROJECT AND BEFORE FINAL APPROVAL, THE CONTRACTOR SHALL MAKE ANY FINAL CORRECTIONS TO DRAWINGS AND CERTIFY THE ACCURACY OF EACH PRINT BY SIGNATURE THEREON.

### H. DISCREPANCIES IN DOCUMENTS

DRAWINGS (PLANS, SPECIFICATIONS, AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE ELECTRICAL SYSTEMS. WHERE DRAWINGS, SPECIFICATIONS OR OTHER TRADES CONFLICT OR ARE UNCLEAR, ADVISE THE CONSTRUCTION MANAGER IN WRITING, PRIOR TO SUBMITTAL OF BID. THE CONSTRUCTION MANAGER IS RESPONSIBLE TO ADVISE THE OWNER, IN WRITING, OF DISCREPANCIES IN THE CONTRACT DOCUMENTS PRIOR TO SUBMISSION OF BID. OTHERWISE, THE ARCHITECT INTERPRETATION OF CONTRACT DOCUMENTS OR CONDITIONS SHALL BE FINAL WITH NO ADDITIONAL COMPENSATION PERMITTED.

### GENERAL PRODUCTS

#### A. RACEWAYS

- MINIMUM RACEWAY SIZE IS 3/4" UNLESS NOTED OTHERWISE.
- CONDUIT SHALL BE ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METALLIC CONDUIT (IMC), OR RIGID GALVANIZED STEEL CONDUIT (RGS).
- FLEXIBLE METAL CONDUIT MAY BE USED FOR FINAL CONNECTION TO LIGHT FIXTURES, FOR FINAL CONNECTION TO MOTORS, WHERE CONCEALED.
- METAL CLAD CABLE (TYPE MC) MAY BE USED BETWEEN WIRING DEVICES WHERE ALLOWED BY CODE AND LOCAL AUTHORITY HAVING JURISDICTION AND INSTALLED BE NEC ARTICLE 334.
- CONDUIT INSTALLED CONCEALED MAY BE EMT OR IMC, UNLESS NOTED OTHERWISE.
- CONDUIT SUBJECT TO PHYSICAL DAMAGE SHALL BE RGS, UNLESS NOTED OTHERWISE.
- UNDERGROUND OR IN-SLAB CONDUIT SHALL BE SCHEDULE 40 PVC, UNLESS NOTED OTHERWISE.

#### B. CONDUIT FITTINGS

- IMC AND RGS: NON-SPLIT THREADED STEEL, ZINC DIE CAST IS NOT ACCEPTABLE.
- EMT: COMPRESSION OR DOUBLE SET SCREW TYPE.
- BUSHINGS SHALL BE METALLIC INSULATED TYPE.
- FACTORY BENDS SHALL BE USED FOR ANY CONDUIT SIZE 2" OR LARGER. UNDERGROUND BENDS SHALL BE PVC COATED RGS.

#### C. OUTLET/JUNCTION/PULL BOXES

- OUTLET BOXES SHALL BE PROVIDED AS SHOWN OR REQUIRED BY CODE.
- OUTLET BOXES SHALL BE CODE GAUGE GALVANIZED STEEL, 4" SQUARE AND 2-1/8" DEEP WITH PLASTER RING.
- PROVIDE RAISES COVERS AND FIXTURE STUDS FOR OUTLET BOXES WHERE REQUIRED.
- PROVIDE BLANK COVERS FOR OUTLET BOXES WITHOUT DEVICES.
- PROVIDE 6" SEPARATION BETWEEN BACK-TO-BACK OUTLET BOXES.
- BOXES FOR OUTDOOR USE AND DAMP LOCATIONS SHALL BE WEATHERPROOF GASKETED CAST METAL TYPE.
- BOXES IN HAZARDOUS LOCATIONS SHALL BE CASE FREE ALUMINUM OR AS REQUIRED TO SUIT INTENDED APPLICATION.

- ALL BOXES SHALL BE SIZED PER NEC REQUIREMENTS FOR NUMBER AND SIZE OF CONDUCTORS AND CONDUIT ENTRIES TO SUIT INTENDED APPLICATION.
- COVERS SHALL BE FULLY ENCLOSED AND SECURED AT ALL CORNERS.
- GRADE MOUNTED PULL BOXES SHALL BE MADE OF CONCRETE CONSTRUCTION WITH BOLT DOWN CONCRETE COVERS. PROVIDE A MINIMUM 4" CONCRETE COLLAR AROUND PULL BOX.
- FLOOR BOXES SHALL BE GALVANIZED CAST IRON TYPE WITH BRASS COVERS AND FLANGES SUITABLE FOR CONDUIT AND DEVICES INDICATED. FLOOR BOXES SHALL BE MANUFACTURED BY STEEL CITY OR APPROVED EQUAL.

#### D. WIRE AND CABLE

- CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS LARGER THAN #10 AWG SHALL BE STRANDED.
- ALL CONDUCTORS SHALL BE MINIMUM 75 DEGREES C COPPER UNLESS NOTED OTHERWISE.
- POWER AND LIGHTING CONDUCTOR SIZE SHALL BE MINIMUM #12 AWG UNLESS NOTED OTHERWISE.
- CONDUCTOR INSULATION TYPE SHALL BE THHN/THWN UNLESS NOTED OTHERWISE.
- ALL TERMINATIONS AND DEVICES SHALL BE LISTED FOR 75 DEGREES C UNLESS OTHERWISE NOTED.
- ALL WIRING SHALL BE IDENTIFIED WITH MARKERS TO REFLECT CIRCUIT DESIGNATIONS AT ALL POINTS WHERE WIRING IS ACCESSIBLE.
- ALUMINUM CONDUCTORS ARE ACCEPTABLE FOR FEEDERS 100A OR HIGHER.
- THE FOLLOWING CONDUCTOR SIZES SHALL BE PROVIDED FOR 20A, 10 BRANCH CIRCUITS (HOT, NEUTRAL AND GROUND, BASED ON ACTUAL CIRCUIT LENGTH, UPSIZE RACEWAYS ACCORDINGLY).

CONDUCTOR SIZE	120V	208V	277V	480V
#12 AWG	0-70FT.	0-135FT.	0-160FT.	0-310FT.
#10 AWG	71-120FT.	136-220FT.	161-250FT.	311-500FT.
#8 AWG	121-180FT.	221-325FT.	251-375FT.	501-760FT.
#6 AWG	181-315FT.	-	376-585FT.	-

- CONDUCTORS SHALL HAVE THE FOLLOWING COLOR UNLESS OTHERWISE REQUIRED PER LOCAL ORDINANCES OR REQUIREMENTS:

VOLTAGE SYSTEM	PHASE A	PHASE B	PHASE C	NEUTRAL	GROUND
208/120V, 3Ø, 4W	BLACK	RED	BLUE	WHITE	GREEN
480V, 3Ø, 3W	BROWN	ORANGE	YELLOW		GREEN
480/277V, 3Ø, 4W	BROWN	ORANGE	YELLOW	GRAY	GREEN

#### E. DEVICES

WIRING DEVICES SHALL BE COMMERCIAL SPECIFICATION GRADE AS FOLLOWS:

- WALL SWITCHES: 20A RATED, 120/277V, SINGLE POLE, SILENT TYPE.
- DIMMER SWITCHES: LUTRON NOVAT SERIES RATED FOR LOAD SERVED.
- RECEPTACLES: 20A RATED, 125V DUPLEX GROUNDING TYPE.
- GFI TYPE: 20A RATED GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLE.
- SPECIAL PURPOSE RECEPTACLES SHALL BE TYPE AND RATING PER PLANS AND VERIFIED WITH EQUIPMENT SUPPLIER.
- DEVICES AND COVER PLATE COLOR SHALL BE PER OWNER.
- MOUNTING HEIGHTS SHALL BE INDICATED ON THE DRAWINGS OR AS REQUIRED BY ADA OR AUTHORITY HAVING JURISDICTION.
- 15A DEVICES ARE APPROVED FOR DWELLING UNITS.

#### F. FUSES AND CIRCUIT BREAKERS

- FUSES PROTECTING MOTORS SHALL BE EQUIVALENT TO BUSSMAN DUAL ELEMENT TIME DELAY CLASS RK-6.
- CIRCUIT BREAKERS SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD, DISTRIBUTION PANEL OR PANELBOARDS WITH THE RATING AND NUMBER OF POLES AS INDICATED OR SCHEDULED.
- CIRCUIT BREAKERS SERVING HVAC TYPE EQUIPMENT SHALL BE HACR TYPE AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
- CIRCUIT BREAKERS USED FOR SWITCHING SHALL BE SWD TYPE RATED FOR SWITCHING USE.
- SERIES RATED CIRCUIT BREAKERS AND EQUIPMENT IS NOT ACCEPTABLE.

#### G. MOTOR STARTERS AND DISCONNECTS

- MOTOR CONTROLLERS: 600V AC HEAVY DUTY RATED, SINGLE OR MULTI-POLE TO SUIT APPLICATION AND MOUNTED IN SUITABLE NEMA ENCLOSURE.
- ALL MOTOR CONTROLLERS SHALL BE HORSEPOWER RATED TO SUIT MOTOR BEING CONTROLLED.
- PROVIDE H-O-A OR START/STOP OPERATION AS NEEDED FOR APPLICATION. VERIFY WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN.
- PROVIDE MINIMUM TWO (2) NORMALLY OPEN AND TWO (2) NORMALLY CLOSED AUXILIARY CONTACTS FOR MOTOR CONTROLLERS.
- DISCONNECTS: 600V AC HEAVY DUTY RATED, FUSED OR NON-FUSED AS INDICATED, SINGLE OR MULTI-POLE TO SUIT APPLICATION AND MOUNTED IN SUITABLE NEMA ENCLOSURE.

#### H. DISTRIBUTION PANELS AND PANELBOARDS

- ACCEPTABLE EQUIPMENT MANUFACTURERS SHALL BE GENERAL ELECTRIC, SIEMENS, SQUARE D, EATON OR APPROVED EQUAL.
- DISTRIBUTION PANELS AND PANELBOARDS SHALL MEET THE SEISMIC QUALIFICATIONS OF THE ADOPTED BUILDING CODE.
- GROUNDING CONNECTIONS SHALL BE MADE WITH APPROVED CONNECTORS AND METHODS ACCEPTABLE TO AUTHORITY HAVING JURISDICTION.
- ALL PANELBOARDS SHALL BE BOLT-ON CIRCUIT BREAKER TYPE, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- WIRE TERMINATIONS SHALL BE UL LISTED FOR 75 DEGREES.
- FLUSH MOUNTED PANELBOARDS SHALL HAVE A MINIMUM OF TWO (2) 1" AND FOUR (4) 3/4" EMPTY CONDUITS STUBBED UP FROM PANEL TO ABOVE ACCESSIBLE CEILING SPACE FOR FUTURE BRANCH CIRCUIT WIRING.
- DISTRIBUTION PANELS AND PANELBOARDS SHALL HAVE A SEPARATE GROUND BUS ISOLATED FROM THE NEUTRAL BUS.
- ALL DISTRIBUTION PANELS AND PANELBOARDS SHALL BE UL LISTED AND FULLY RATED FOR THE AIC RATING INDICATED ON THE DRAWINGS. SERIES RATED EQUIPMENT IS NOT ACCEPTABLE.
- CONTRACTOR IS RESPONSIBLE TO CONFIRM SUBMITTED EQUIPMENT WILL FIT WITHIN ALLOTTED SPACE SHOWN AND COMPLY WITH ALL NEC CLEARANCE REQUIREMENTS.
- ALL BUSSES SHALL BE COPPER.

#### I. LIGHTING FIXTURES

- ALL LIGHTING FIXTURES SHALL BE UL LISTED.
- ALL FLUORESCENT FIXTURES SHALL BE PROVIDED WITH ENERGY SAVING LAMPS AND ELECTRONIC BALLASTS. PROVIDE COLD START BALLASTS FOR EXTERIOR LIGHTING FIXTURES.
- ALL LAMPS SHALL BE THE SAME MANUFACTURER AND FURNISHED BY THE CONTRACTOR UNLESS NOTED OTHERWISE ON THE DRAWINGS. ALL BALLASTS SHALL BE LOW HARMONIC TYPE THD<10%.

#### J. TV, TELEPHONE, AND DATA SYSTEMS

- PROVIDE A COMPLETE CONDUIT SYSTEM FOR TV, TELEPHONE, DATA AND COMBINATION OUTLETS SHOWN.
- TV, TELEPHONE, DATA AND COMBINATION OUTLETS INDICATED SHALL TERMINATE AT THE TERMINAL BOARD OR CABINET INDICATED ON THE DRAWINGS, UNLESS NOTED OTHERWISE.
- TERMINAL BOARD SHALL BE A 4"X8"X3/4" FIRE RATED SHEET OF PLYWOOD, UNLESS NOTED OTHERWISE.
- TERMINAL CABINETS SHALL BE SIZED AS INDICATED ON THE DRAWINGS OR SUITABLE FOR INSTALLATION IF NOT INDICATED WITH NEMA ENCLOSURE.
- TELEPHONE SERVICE AND CABLE TV SERVICE DEMARC CONDUITS AND REQUIREMENTS SHALL BE COORDINATED AND VERIFIED WITH THE SERVING UTILITIES AND OWNER PRIOR TO BID.

#### GENERAL EXECUTION

- THOROUGHLY CLEAN ALL ITEMS BEFORE INSTALLATION.
- ALL WORK SHALL BE PROPERLY SUPPORTED FROM THE BUILDING STRUCTURE IN AN APPROVED MANNER.
- EQUIPMENT SHALL BE FASTENED TO BUILDING CONSTRUCTION WITH APPROVED SUPPORTS.
- COORDINATE ELECTRICAL WORK WITH OTHER TRADES PRIOR TO SUBMITTING BID.
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF ELECTRICAL DEVICES, INCLUDING RECEPTACLES, SWITCHES, DATA AND TELEPHONE OUTLETS. IF LOCATIONS ARE NOT DEPICTED ON THE ARCHITECTURAL DRAWINGS, OBTAIN APPROVAL OF ARCHITECT PRIOR TO ROUGH-IN.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING, PATCHING AND COMPLETE REPAIR OF EXISTING BUILDING WALLS, CEILINGS ETC AS REQUIRED FOR INSTALLATION OF ELECTRICAL SYSTEMS.
- PROVIDE ENGRAVED NAME PLATES WITH SHEET METAL SCREWS FOR EACH PIECE OF EQUIPMENT INCLUDING: PANELBOARDS, TRANSFORMERS, DISTRIBUTION PANELS, SWITCHBOARDS, DISCONNECTS, MOTOR STARTERS, ETC. LABELED FOR AS-BUILT DRAWINGS.
- ELECTRICAL DISTRIBUTION EQUIPMENT SHALL BE OF THE SAME MANUFACTURER, INCLUDING PANELBOARDS, TRANSFORMERS, DISTRIBUTION PANELS, SWITCHBOARDS, DISCONNECTS, MOTOR STARTERS, ETC.

## INSTALLATION

### A. RACEWAYS

- RACEWAYS SHALL BE INSTALLED CONCEALED, UNLESS NOTED OTHERWISE.
- ALL RACEWAYS REQUIRED TO BE EXPOSED SHALL BE PAINTED TO MATCH THE ADJACENT BUILDING SURFACE.
- SUPPORT RACEWAYS WITH TOGGLE BOLTS ON HOLLOW MASONRY, MACHINE SCREWS ON METAL SURFACES, BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD.
- RACEWAYS SHOULD BE INSTALLED PARALLEL AND PERPENDICULAR TO BUILDING SURFACES AND AT RIGHT ANGLES.
- PROVIDE 200LB PULL STRING IN ALL EMPTY RACEWAYS.
- RACEWAYS PASSING THROUGH FIRE RATED CONSTRUCTION SHALL BE SEALED WITH UL LISTED FIRE RATED SEALANT. WHERE ELECTRICAL RACEWAYS ARE INSTALLED THROUGH RATED FLOORS OR WALLS, THE CONTRACTOR SHALL PROVIDE APPROPRIATE FITTINGS APPROVED BY ALL REQUIRED LOCAL AUTHORITIES FOR INTENDED APPLICATION.
- OBTAIN FINAL APPROVAL FROM ARCHITECT PRIOR TO THE INSTALLATION OF RACEWAYS THROUGH RATED WALLS OR FLOORS.
- HOME RUNS MAY BE COMBINED IN CONDUIT PER NEC REQUIREMENTS FOR DERATING AND FILL.
- INSTALL ALL RACEWAY SYSTEMS PER THE NEC. DEVIATIONS FROM THE WIRING INDICATED SHALL NOT BE ALLOWED WITHOUT SPECIFIC WRITTEN APPROVAL PRIOR TO PLACING BID AND INSTALLATION.
- INCLUDE ALL COSTS FOR RACEWAYS SYSTEMS AS SPECIFIED UNLESS WRITTEN APPROVAL FOR ALTERNATE WIRING METHOD IS OBTAINED FROM THE ARCHITECT, ENGINEER AND OWNER PRIOR TO SUBMITTING BID.
- PROVIDE EQUIPMENT GROUNDING CONDUCTOR PER NEC 250 IN RACEWAYS.
- PROVIDE SEPARATE RACEWAYS FOR EMERGENCY SYSTEM WIRING AND NORMAL SYSTEM WIRING.
- ALL RACEWAYS AND CONDUCTORS SIZES SHOWN ARE TO BE INSTALLED WITHIN THE BUILDING STRUCTURE NOT EXPOSED TO AMBIENT CONDITIONS. IF RACEWAYS AND CONDUCTORS ARE ROUTED EXPOSED TO AMBIENT CONDITIONS, CONTRACTOR SHALL DERATE CONDUCTORS AND UPSIZE RACEWAYS ACCORDINGLY.
- RACEWAYS PENETRATING THROUGH ROOF SHALL HAVE ROOF FLASHING WITH CAULK AND SLEEVE. INSTALLATION SHALL BE WATERTIGHT.
- ALL UNDERGROUND SERVICE CONDUITS SHALL BE SEALED PER NEC ARTICLE 230.8.
- ALL UNDERGROUND OR BELOW GRADE RACEWAYS SHALL INSTALLED IN COMPLIANCE WITH NEC TABLE 300.5.

### B. FITTINGS AND ACCESSORIES

- OUTLET EXPANSION AND DEFLECTION FITTINGS FOR CONDUITS CROSSING EXPANSION JOINTS. PROVIDE BONDING JUMPERS FOR ALL EXPANSION FITTINGS.
- FITTINGS SHALL BE SUITABLE FOR CONDITIONS OF INSTALLATION. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ADDITIONAL.

### C. OUTLET, JUNCTION AND PULL BOXES

- OUTLET BOXES SHALL BE METALLIC WITH GROUND CONNECTION AND EQUIPMENT GROUNDING CONDUCTOR CONNECTION AND EQUIPMENT GROUNDING CONDUCTOR CONNECTION.
- PROVIDE INSULATED SUPPORTS FOR CABLES.
- PROVIDE SEPARATE BOXES FOR DIFFERENT VOLTAGE SYSTEMS.
- PROVIDE SEPARATE BOXES FOR EMERGENCY SYSTEM WIRING AND FOR NORMAL SYSTEM WIRING.
- COORDINATE FLOOR BOX LOCATIONS WITH ARCHITECT, STRUCTURAL ENGINEER, FURNITURE CONSULTANT AND INTERIOR DESIGNER PRIOR TO ROUGH-IN. SEE THOSE DRAWINGS FOR ADDITIONAL INFORMATION.

### D. WIRE AND CABLE

- DO NOT COMBINE HOMERUNS, UNLESS NOTED OTHERWISE.
- PROVIDE INSULATION TESTING DOCUMENTATION OF ALL FEEDER AND DISTRIBUTION WIRING. REMOVE AND REPLACE WIRING NOT MEETING MANUFACTURER'S RECOMMENDED INSULATION RESISTANCE.
- PROVIDE TESTING DOCUMENTATION SHOWING GROUNDING SYSTEM FOR THIS PROJECT WITH RESISTANCE OF LESS THAN 5 OHMS.

### E. DEVICES

- INSTALL SWITCHES @48" AFF TO CENTER OF SWITCH, UNLESS NOTED OTHERWISE.
- INSTALL RECEPTACLES @18" AFF TO CENTER OF DEVICE, UNLESS NOTED OTHERWISE.
- RECEPTACLES LOCATED FOR COUNTERTOP USE SHALL BE 6" TO THE CENTER OF DEVICE ABOVE THE COUNTERTOP.

### F. FUSES AND CIRCUIT BREAKERS

- PROVIDE ALL FUSES FOR DEVICES SHOWN.
- PROVIDE OWNER TWO (2) SPARE SETS OF FUSES OF EACH TYPE AND RATING INSTALLED.
- PROVIDE FUSE PULLER FOR EACH TYPE OF FUSE.
- PROVIDE SPARE FUSE CABINET WHERE INDICATED ON THE DRAWINGS.
- VERIFY FUSES WITH MANUFACTURER OF EQUIPMENT PRIOR TO INSTALLATION.
- WHERE NEW OVERCURRENT DEVICES ARE ADDED TO EXISTING SWITCHBOARD, DISTRIBUTION PANELS AND PANELBOARDS, UTILIZE SPARES AND/OR PROVIDE ADDITIONAL BREAKERS OR SWITCHES AS REQUIRED TO EXISTING SPACES OR PROVIDE A NEW PANELBOARD OR SECTION SUBFD FROM THE EXISTING SYSTEM. SHORT CIRCUIT INTERRUPTING RATING OF NEW OVERCURRENT DEVICES SHALL MATCH THE RATING OF THE EXISTING EQUIPMENT.

### G. MOTOR STARTERS AND DISCONNECTS

- INSTALL MOTOR STARTERS AND DISCONNECTS AS REQUIRED PER THE NEC.
- WALL MOUNTED MOTOR STARTERS AND DISCONNECTS SHALL BE INSTALLED @54" TO BOTTOM OF DEVICE, UNLESS NOTED OTHERWISE.

### H. DISTRIBUTION PANELS AND PANELBOARDS

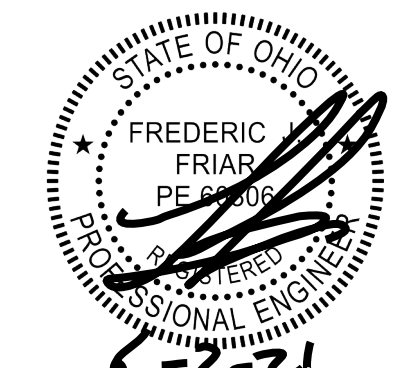
- CONTRACTOR SHALL BALANCE THE LOADS IN ALL PANELBOARDS TO LESS THAN 10% IMBALANCE BETWEEN THE PHASES.
- PROVIDE TYPEWRITTEN PANELBOARD SCHEDULES IN PANELBOARD DOORS DEPICTING THE FINAL AS-BUILT CONDITIONS AT PROJECT COMPLETION.
- ALL ELECTRICAL SYSTEMS, EQUIPMENT AND COMPONENTS SHALL BE GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 250.
- ALL FLOOR MOUNTED SWITCHBOARDS AND DISTRIBUTION PANELS SHALL HAVE 4" HIGH HOUSEKEEPING PAD EXTENDING 4" OUTSIDE THE EQUIPMENT FOOTPRINT IN ALL DIRECTIONS.
- ALL SWITCHBOARDS, DISTRIBUTION PANELS AND PANELBOARDS SHALL BE INSTALLED TO MEET THE NEC 110-26 CLEARANCE REQUIREMENTS.
- ALL UTILITY METERING DEVICES SHALL BE INSTALLED PER THE SERVING UTILITY COMPANY'S REQUIREMENTS.
- ANY CUSTOMER OWNED MEETING DEVICES SHALL BE INSTALLED AS INDICATED ON DRAWINGS.
- PROVIDE ALL REQUIRED DEVICES AND EQUIPMENT FOR A COMPLETE AND OPERABLE METER INSTALLATION.

### J. LIGHTING FIXTURES

- PROVIDE ALL NECESSARY SUPPORTS FOR LIGHTING FIXTURES REQUIRED.
- WHERE FIXTURES ARE INSTALLED ON OR IN SUSPENDED CEILING SYSTEMS, SECURE FIXTURES TO CEILING FRAME SYSTEM AND PROVIDE FIXTURE SUPPORTS INDEPENDENT OF CEILING SUSPENSION SYSTEM AS REQUIRED PER APPLICABLE CODE.
- INCLUDE IN BASE BID ALL LABOR AND MATERIAL TO INSTALL FIXTURES, INCLUDING THOSE PROVIDED BY THE OWNER.
- PROVIDE CEILING MOUNTED PENDANT FIXTURE WITH APPROVED SUPPORT FOR WEIGHT TO BE SUPPORTED AND FOR SEISMIC COMPLIANCE.
- RECESSED FIXTURES IN FIRE RATED CEILINGS AND RETURN OR PLENUMS SHALL BE APPROVED FOR THE FIRE RATING OF THE CEILING OR SHALL BE FULLY ENCLOSED IN A FIRE RATED HOUSING ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
- SEAL ALL OPENINGS AS REQUIRED TO ELIMINATE AIR LEAKS.
- VERIFY TYPE OF MOUNTING REQUIRED FOR ALL LIGHTING FIXTURES AND PROVIDE ALL MOUNTING HARDWARE REQUIRED FOR A COMPLETE INSTALLATION.
- ALL ADJUSTABLE FIXTURES SHALL BE LOCATED AND PROPERLY AIMED AS DIRECTED BY THE ARCHITECT OR LIGHTING DESIGNER. ALL AIMING OF BUILDING FACADE LIGHTING SHALL BE PERFORMED BY CONTRACTOR AT NIGHT.

### K. TV, TELEPHONE AND DATA SYSTEM

- MINIMUM RACEWAY SIZE IS 1", UNLESS NOTED OTHERWISE.
- PROVIDE #6 AWG GROUND WIRE FROM SERVICE ENTRANCE GROUNDING ELECTRODE TO TELEPHONE SYSTEM LOCATION AND ALL TELEPHONE TERMINAL BOARDS, UNLESS NOTED OTHERWISE.



**FRED FRIAR, P.E.**  
CONSULTING ENGINEER

5732 Route 152, LAVALETTE, WV 25535  
(304) 962-7006 | FRED@FRIARPE.COM

REV.	DESCRIPTION	DATE
	REVIEW SET	06-02-21
	PRICING SET	06-02-21

SPECIFICATIONS

LAWRENCE ECONOMIC DEVELOPMENT CORP.

SPEC 13 COMMERCE DRIVE

DRAWN BY:  
F. FRIAR

CHECKED BY:  
F. FRIAR

DATE:  
06-02-21

**GENERAL NOTES**

(THIS SHEET ONLY)

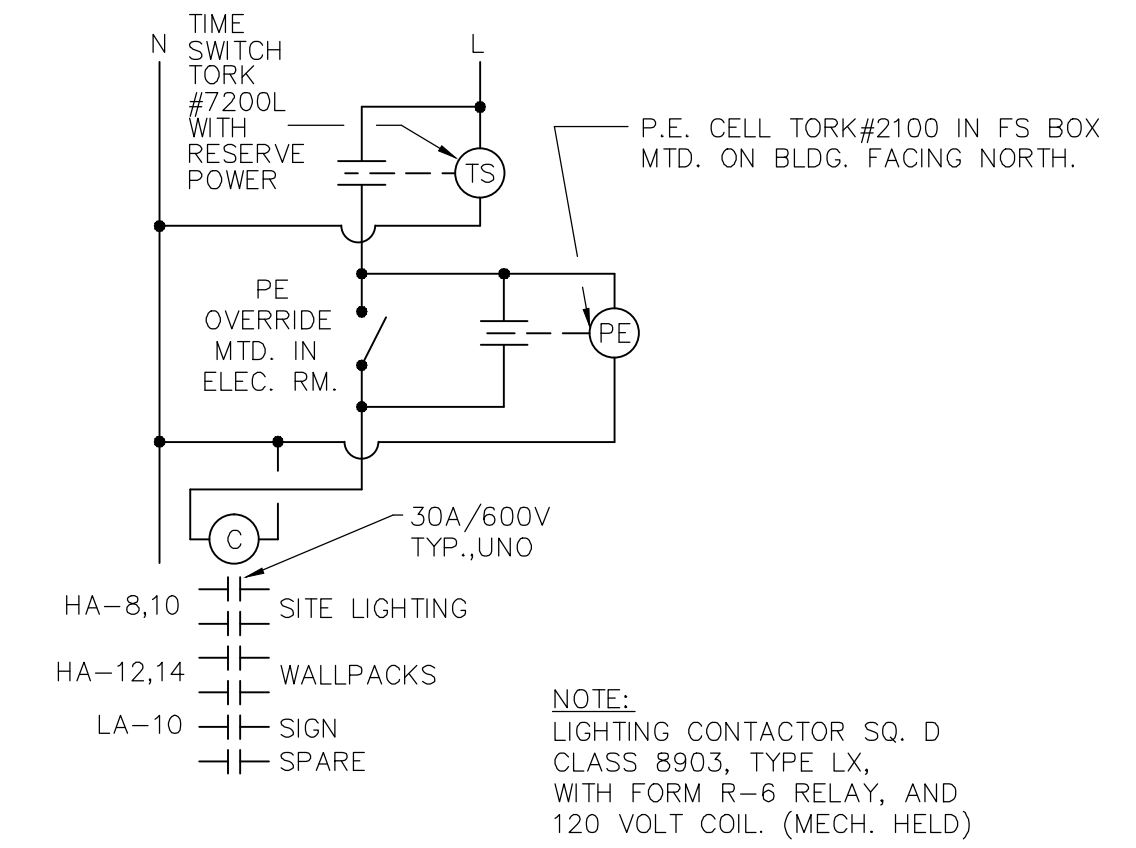
- COORDINATE POWER AND TELECOMMUNICATION SERVICE WITH RESPECTIVE UTILITIES. REFER TO POWER RISER DIAGRAM FOR ADDITIONAL INFORMATION FOR ELECTRIC SERVICE.
- COORDINATE FINAL SITE LAYOUT WITH CIVIL DRAWINGS.

**SITE NOTES**



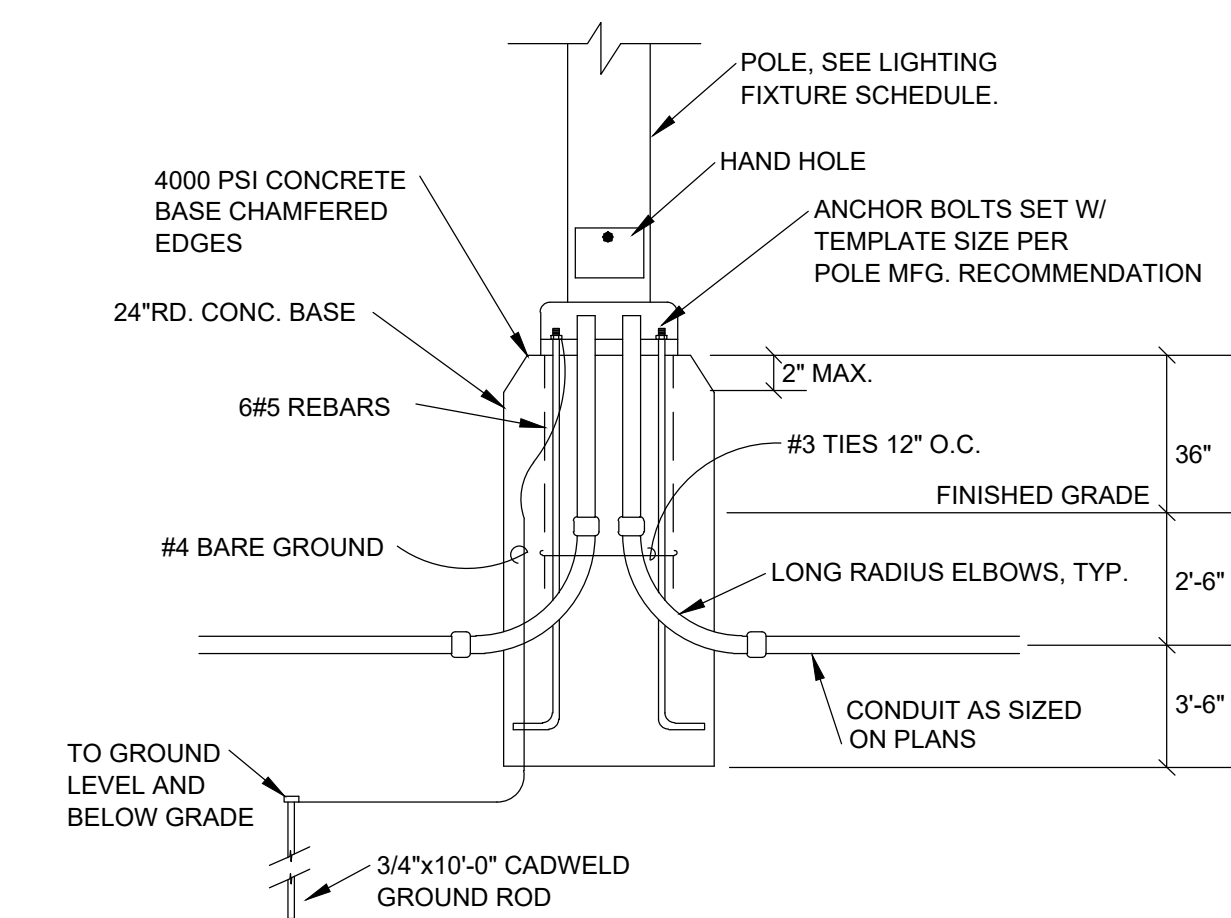
(THIS SHEET ONLY)

- POWER COMPANY UNDERGROUND PRIMARY SERVICE FEEDER. CONDUIT BY CONTRACTOR. CONDUCTORS BY POWER COMPANY. PROVIDE (2) 5" SCH 40 PVC CONDUIT WITH 36" MINIMUM COVER, PULL STRING, AND MARKER TAPE ABOVE CONDUIT. STUB CONDUIT AT LOCATION OF PAD MOUNTED TRANSFORMER PRIMARY COMPARTMENT, AND STUB 7" AT BASE OF POLE AT LOCATION OF UTILITY POINT OF CONNECTION.
- PAD-MOUNTED TRANSFORMER. STUB CONDUIT PER POWER COMPANY REQUIREMENTS. PROVIDE SLAB AND CABLING PIT PER POWER COMPANY SPECIFICATIONS. TRANSFORMER PROVIDED BY POWER COMPANY.
- SECONDARY SERVICE CONDUCTORS BY CONTRACTOR. REFER TO POWER RISER DIAGRAM FOR ADDITIONAL INFORMATION.
- MAIN SWITCHBOARD "MSB"
- PROVIDE (2) 2" EMPTY CONDUIT WITH PULL STRINGS FROM PHONE BOARD TO BASE OF POLE AT LOCATION OF TELECOMMUNICATIONS PROVIDER POINT OF CONNECTION. UTILIZE LONG SWEEPING BENDS SUITABLE FOR FIBER. PROVIDE 30" MINIMUM COVER ABOVE CONDUIT WITH MARKER TAPE ABOVE CONDUIT.
- PHONE BOARD.
- ROUTE LIGHTING CIRCUIT THROUGH LIGHTING CONTROLS. REFER TO LIGHTING CONTROLS DIAGRAM FOR ADDITIONAL INFORMATION.
- PROVIDE 120V CIRCUIT IN WP J-BOX FOR SIGN. FIELD COORDINATE EXACT LOCATION. ROUTE THROUGH LIGHTING CONTROL PANEL.



**LIGHTING CONTROLS**

SCALE: NO SCALE

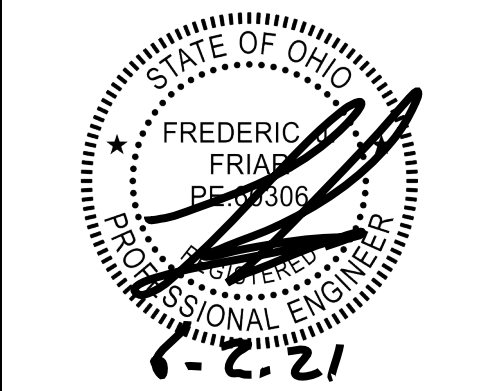
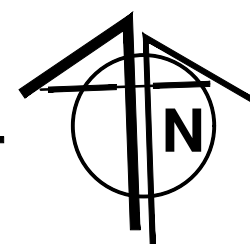


**POLE BASE**

SCALE: NO SCALE

**SITE PLAN**

SCALE: 1" = 30'-0"



**FRED FRIAR, P.E.**  
CONSULTING ENGINEER

5732 ROUTE 152, LAVALETTE, WV 25535  
(304) 962-7006 | FRED@FRIARPE.COM

REV.	DESCRIPTION	DATE
	REVIEW SET	06-02-21
	PRICING SET	06-02-21

**SPEC 13 COMMERCE DRIVE**  
**LAWRENCE ECONOMIC DEVELOPMENT CORP.**

**SITE PLAN**

DRAWN BY: F. FRIAR  
CHECKED BY: F. FRIAR  
DATE: 06-02-21

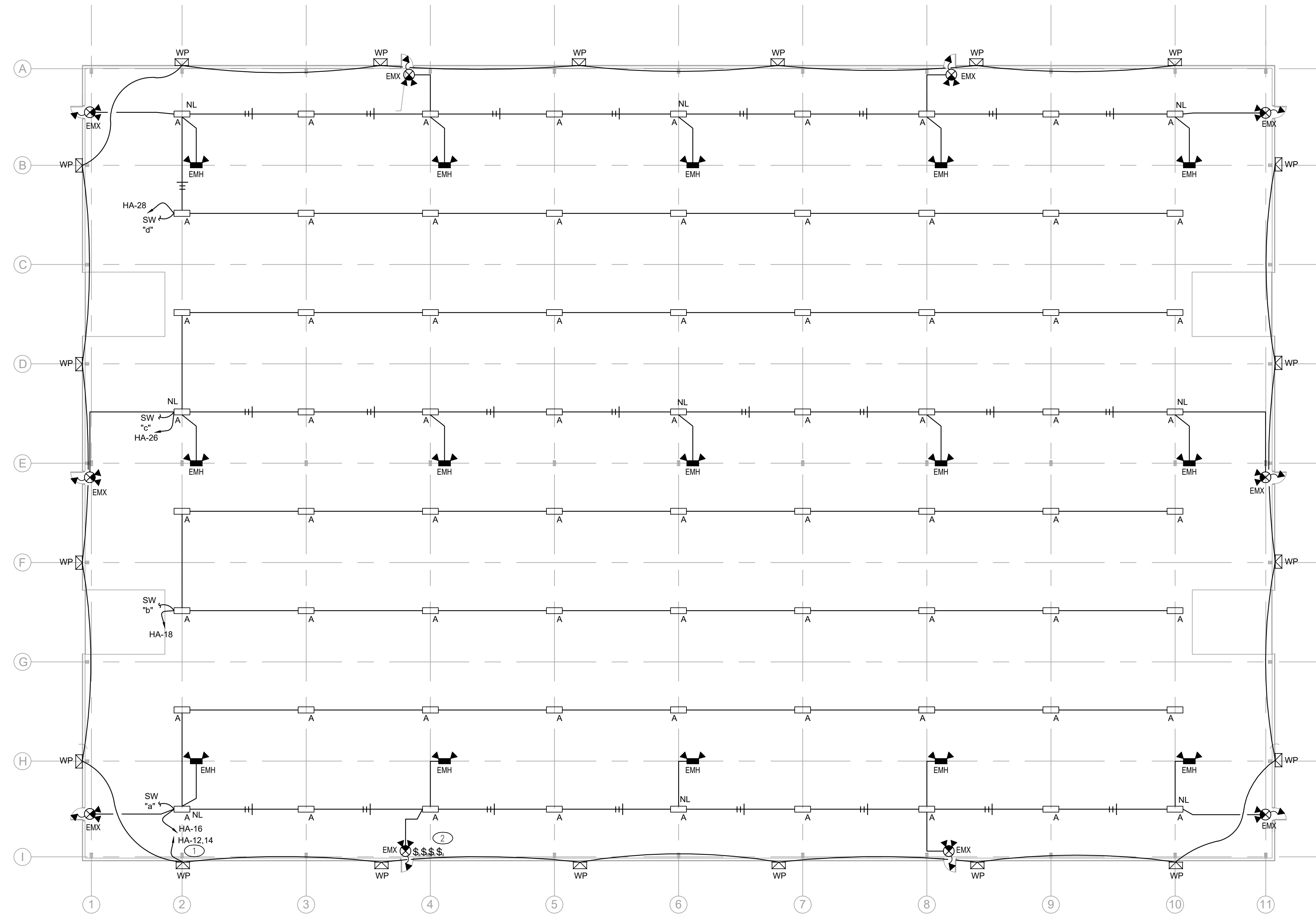


**GENERAL NOTES**

1. CONNECT ALL EXIT SIGNS, EGRESS FIXTURES, AND NIGHT LIGHTS (NL) TO THE UNSWITCHED LEG OF LOCAL LIGHTING CIRCUIT SHOWN.
2. LIGHTING FIXTURE LAYOUT SHOWN IS SCHEMATIC AND SHALL BE COORDINATED WITH STRUCTURAL ELEMENTS.
3. UTILIZE #10 WIRING THROUGHOUT FOR HIGH BAY (TYPE "A") LIGHTING.
4. UTILIZE (2) #10 AND (1) #10G IN 3/4" CONDUIT THROUGHOUT FOR WALLPACK (TYPE "WP") LIGHTING.
5. PROVIDE ALLOWANCE FOR (8) LED SIGNS (BATTERY BACKUP, NO REMOTE HEADS) IN OPEN WAREHOUSE AREA, CONNECTED TO UNSWITCHED HOT CONDUCTOR OF LOCATION LIGHTING CIRCUIT.

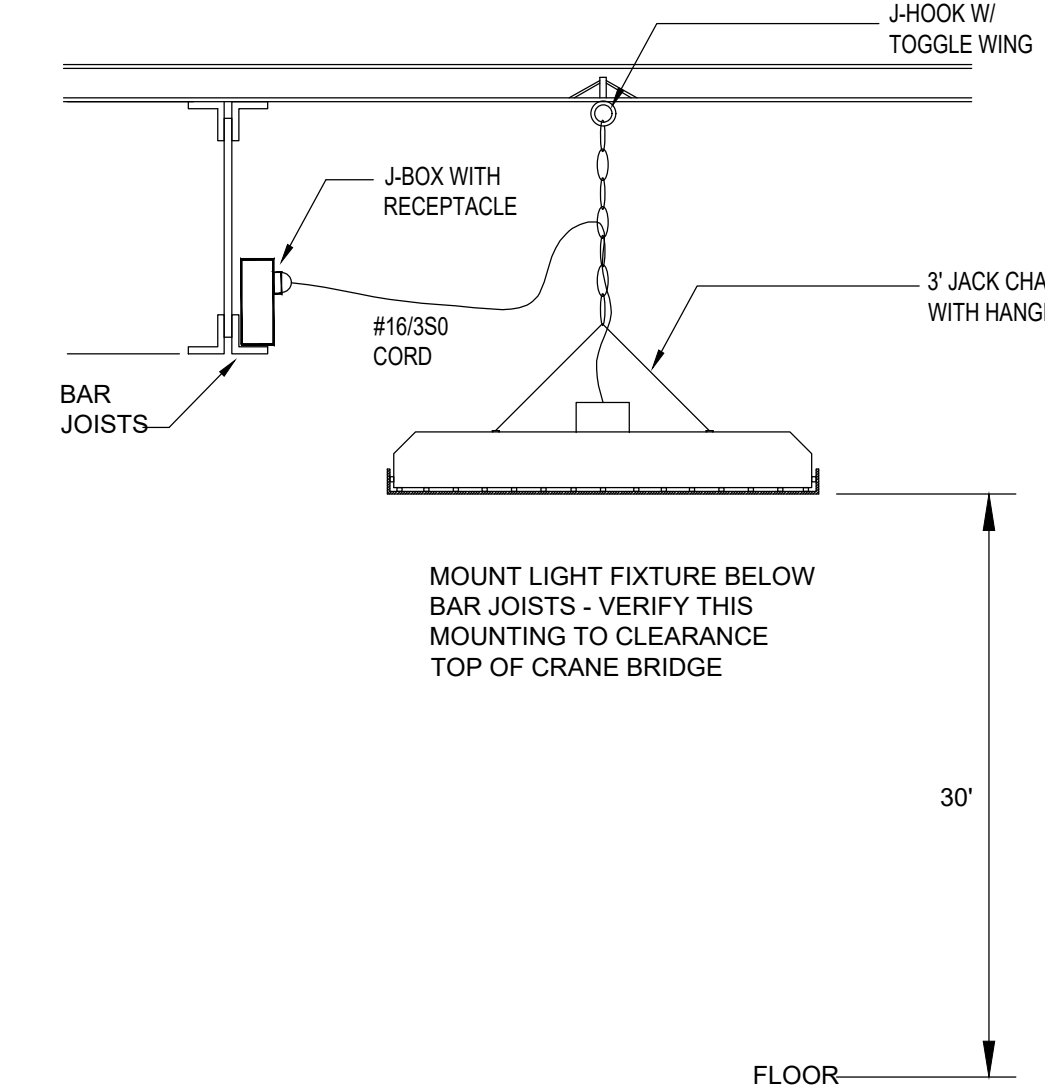
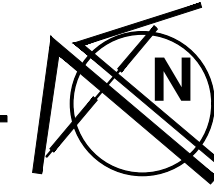
**LIGHTING NOTES**

1. CIRCUIT TO PANEL AND CIRCUIT SHOWN VIA LIGHTING CONTROLS. REFER TO E-3 FOR LIGHTING CONTROLS DIAGRAM.
2. FIELD COORDINATE LOCATION OF SWITCH BANK.



**LIGHTING PLAN**

SCALE: 1/16" = 1'-0"



**HIGH BAY FIXTURE MOUNTING DETAIL**

SCALE: NO SCALE

LIGHTING FIXTURE SCHEDULE						
TAG	MANUFACTURER	CATALOG NO.	MOUNTING	VOLT	LAMP	DESCRIPTION
P3	LITHONIA	DSX1 LED P5 40K T3M MVOLT DDBXD	23' MOUNTING HEIGHT ON A 20' SQUARE STRAIGHT STEEL POLE	480V	138W LED	PARKING AREA LED LIGHTING FIXTURE.
A	LITHONIA	IBHST 24000LM SD080 MD MVOLT 40K 80CRI	PENDANT (CHAIN), BOTTOM OF FIXTURE 30' AFF	277V	216W LED	HIGH BAY LED
WP	LITHONIA	KAXW P3 40K R4 MVOLT DDBXD	WALL MOUNTED 18' ABOVE FINISHED GRADE	480V	79W LED	LED WALLPACK
EMH	CONCEALITE	HSN II 100 90	SURFACE	277V	(2) 100W HALOGEN	WAREHOUSE EMERGENCY LIGHTING UNIT
EMX	LITHONIA	LHQM LED R HO 120/277 HO	SURFACE	120V 277V	INTEGRAL LED	COMBINATION EXIT SIGN/EMERGENCY LIGHTING UNIT, LED LAMPS, REMOTE CAPABLE.
R	LITHONIA	ELA T QWP L0309	SURFACE	-	INTEGRAL LED	DOUBLE EMERGENCY REMOTE HEAD

NOTES:  
1. ALTERNATE FIXTURES MAY BE SUBMITTED FOR APPROVAL.



**FRED FRIAR, P.E.**  
CONSULTING ENGINEER  
5732 ROUTE 152, LAVALETTE, WV 25535  
(304) 962-7006 | FRED@FRIARPE.COM

REV.	DESCRIPTION	DATE
	REVIEW SET	06-02-21
	PRICING SET	06-02-21

**SPEC 13 COMMERCE DRIVE**  
**LAWRENCE ECONOMIC DEVELOPMENT CORP.**

**LIGHTING PLAN**

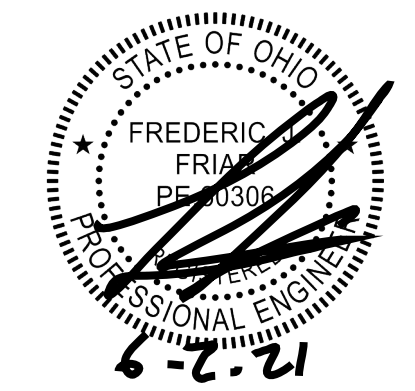
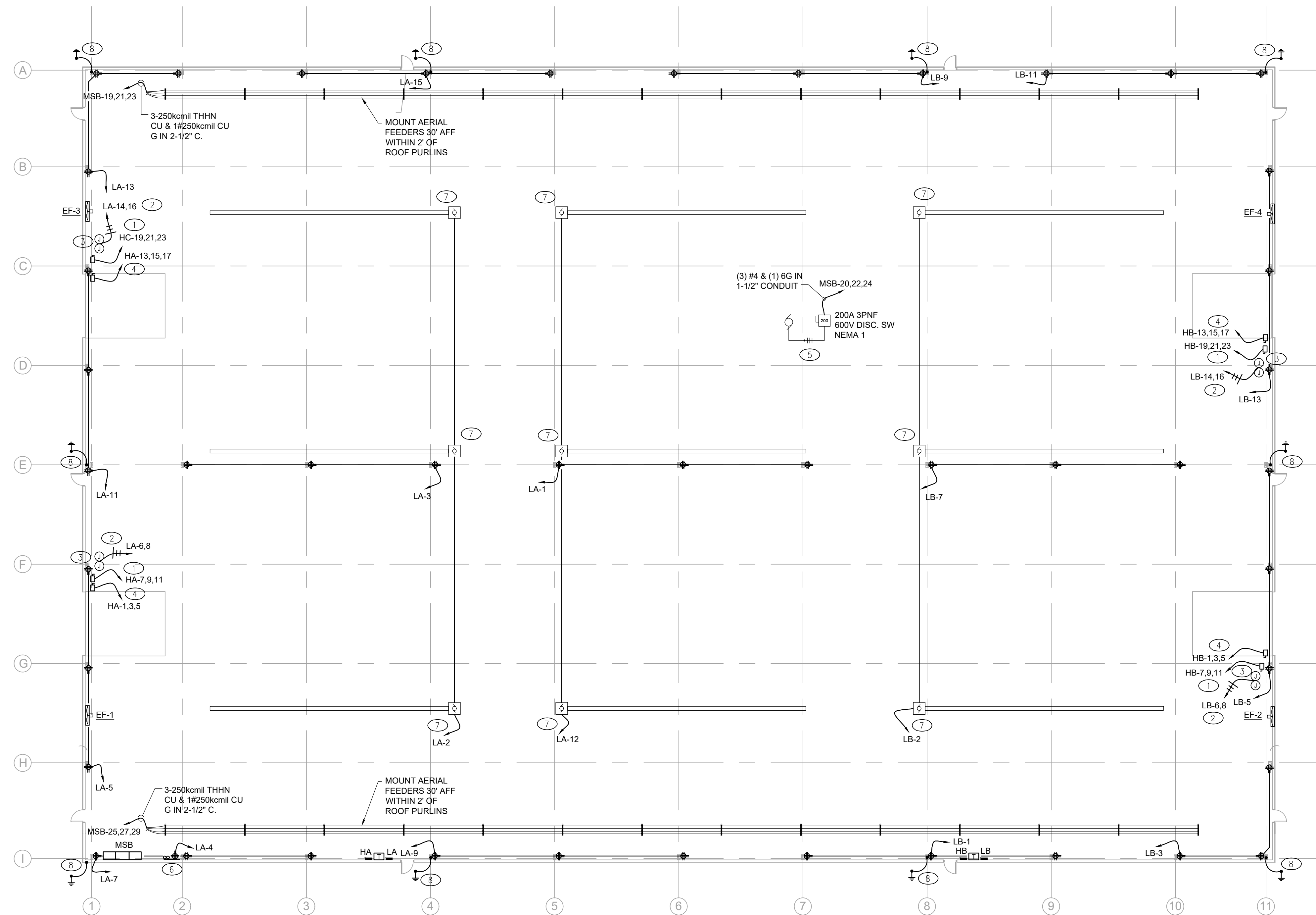
DRAWN BY: F. FRIAR  
CHECKED BY: F. FRIAR  
DATE: 06-02-21

## GENERAL NOTES

- COORDINATE ELECTRICAL REQUIREMENTS, INCLUDING LOCATION AND ROUGH-IN HEIGHTS WITH OWNER PRIOR TO ROUGH-IN.
- FIELD COORDINATE MECHANICAL EQUIPMENT LOCATIONS AND ELECTRICAL REQUIREMENTS WITH MECHANICAL CONTRACTOR.
- COORDINATE EXACT TELECOMMUNICATIONS AND AV REQUIREMENTS WITH OWNER AND RESPECTIVE UTILITY PROVIDERS.
- PROVIDE WP/GFI CONVENIENCE RECEPTACLE WITHIN 25' OF ALL MECHANICAL EQUIPMENT LOCATED OUTDOORS, INCLUDING ROOF.
- PROVIDE #10 WIRING THROUGHOUT FOR CONVENIENCE RECEPTACLE WIRING IN WAREHOUSE.
- ALL RECEPTACLES WITHIN 6' OF SINKS OR OTHER SOURCES OF WATER SHALL BE GFI.
- PROVIDE GFI BREAKER FOR WATER COOLER. FIELD COORDINATE RECEPTACLE LOCATION WITH PLUMBING CONTRACTOR.

## POWER NOTES

- PROVIDE COMPLETE ELECTRICAL CONNECTION FOR DOCK LEVELER SYSTEM.
- PROVIDE 120V CIRCUITS FOR DOCK LIGHT SYSTEM AND CONTROLS.
- PROVIDE RACEWAY FOR DOCK LEVELER SYSTEM CONTROL PANEL, 2" EG TO LOCATION OF MOTOR/ACTUATOR AND CONTROL PANEL.
- PROVIDE COMPLETE ELECTRICAL CONNECTION FOR OVERHEAD DOOR, 1HP, 480V/3Ø. PROVIDE CONDUIT AND WIRING FOR CONTROL STATION. FIELD COORDINATE ELECTRICAL REQUIREMENTS, POWER REQUIREMENTS, AND CONNECTION DETAILS WITH CRANE SUPPLIER.
- PROVIDE PHONE BOARD WITH GROUND BAR AND #6 GROUND CONDUCTOR EXTENDED TO BUILDING GROUNDING POINT, AND (2) 2" EMPTY CONDUIT WITH PULL STRINGS AS SHOWN ON SITE PLAN AND TELECOMMUNICATIONS RISER.
- PROVIDE CIRCUIT FOR RADIANT HEAT SYSTEM, SINGLE BURNER 100,000 BTU GAS RADIANT TUBE HEATER, FRACTIONAL HP FAN. COORDINATE ACTUAL LOCATIONS AND REQUIREMENTS WITH MECHANICAL.
- GROUND ROD WITH #2 CU BONDED TO BUILDING STEEL.

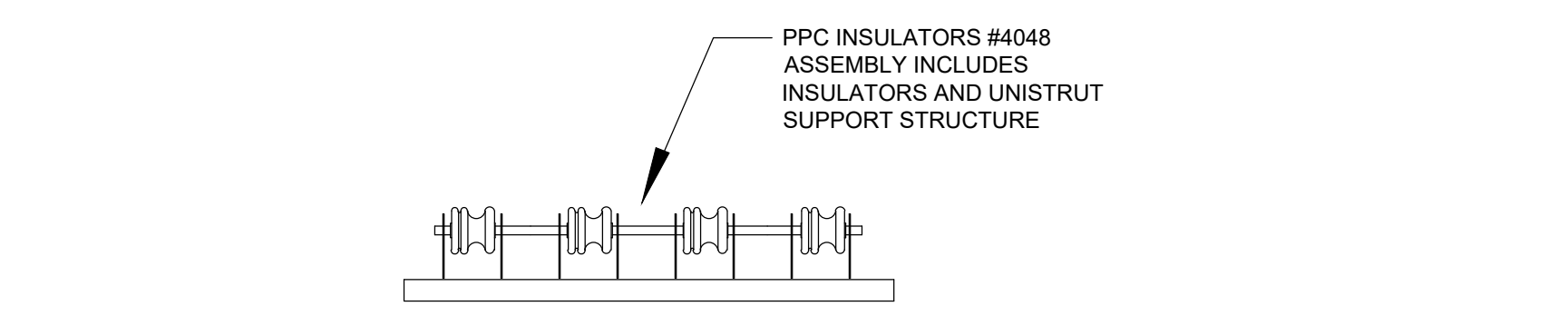
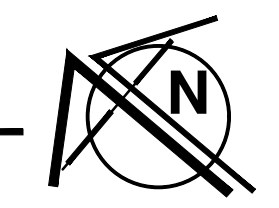


**FRED FRIAR, P.E.**  
CONSULTING ENGINEER  
5732 ROUTE 152, LAVALETTE, WV 25535  
(304) 962-7006 | FRED@FRIARPE.COM

REV.	DESCRIPTION	DATE
	REVIEW SET	06-02-21
	PRICING SET	06-02-21

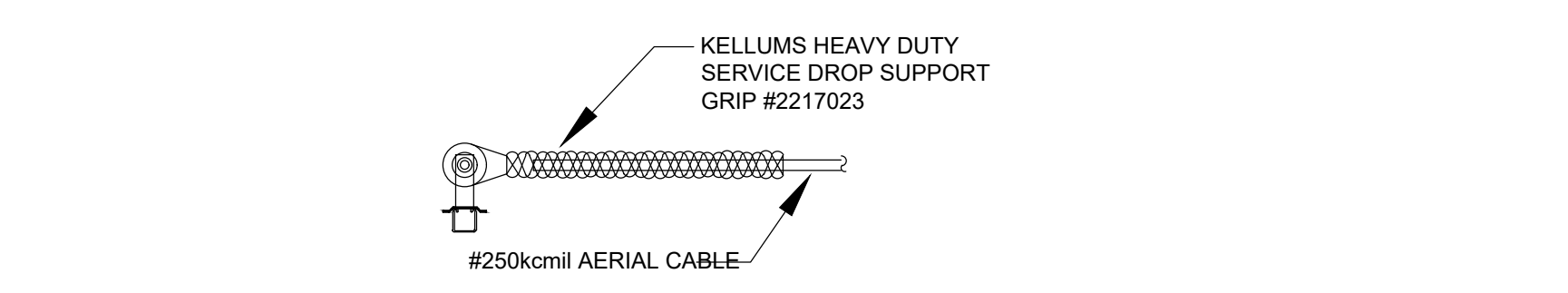
## POWER PLAN

SCALE: 1/16" = 1'-0"



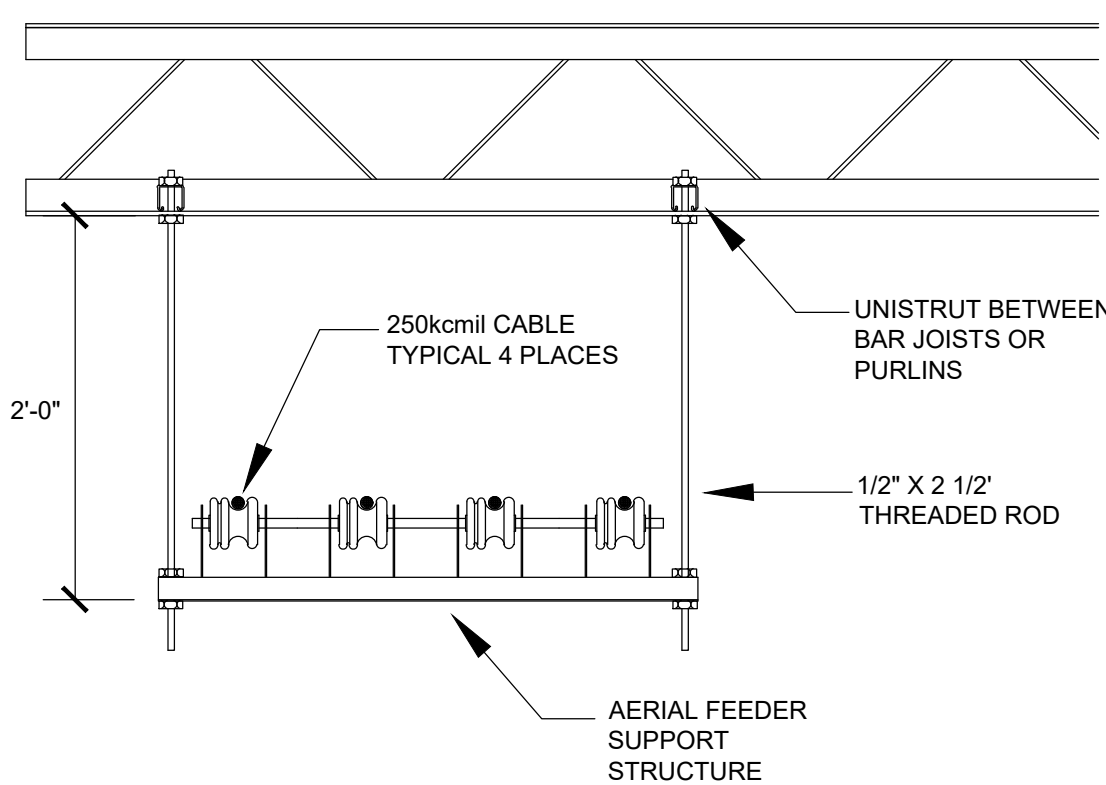
## AERIAL SUPPORT ASSEMBLY

SCALE: NO SCALE



## AERIAL END SUPPORT DETAIL

SCALE: NO SCALE



## AERIAL SUPPORT ASSEMBLY HANGING DETAIL

SCALE: NO SCALE

TAG	ELECTRICAL CHARACTERISTICS				CIRCUIT DESIGNATION	BREAKER		FEEDER	EQUIP. GROUND	CONDUIT	DISCONNECT SWITCH	REMARKS
	VOLTS	PHASE	KW	HP		AMPS	POLES					
EF-1	480	3		2	4.3	HA-2,4,6	15	3	(3) #10	3/4"	30A/3P/NF	SEE NOTE 1
EF-2	480	3		2	4.3	HB-2,4,6	15	3	(2) #10	3/4"	30A/3P/NF	SEE NOTE 1
EF-3	480	3		2	4.3	HA-20,22,24	15	3	(2) #10	3/4"	30A/3P/NF	SEE NOTE 1
EF-4	480	3		2	4.3	HB-8,10,12	15	3	(2) #10	3/4"	30A/3P/NF	SEE NOTE 1

NOTES:  
1. PROVIDE 2#10 AND 1#10G IN 1/2" CONDUIT BETWEEN FAN AND MOTORIZED DAMPER ON OPPOSITE SIDE OF BUILDING, FOR INTERLOCK UTILIZING STARTER AUX CONTACTS SUCH THAT DAMPER OPENS ON FAN OPERATION. PROVIDE 20A/1P SNAP SWITCH FOR MOTORIZED DAMPERS. COORDINATE FAN/DAMPER PAIRING WITH MECHANICAL CONTRACTOR.

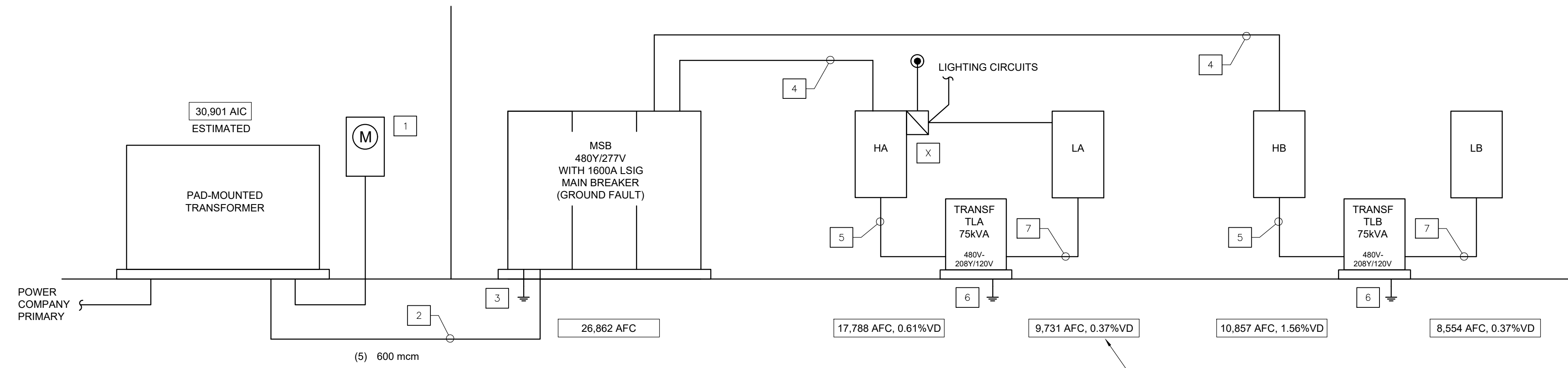
SPEC 13 COMMERCE DRIVE  
LAWRENCE ECONOMIC DEVELOPMENT CORP.

## POWER PLAN

DRAWN BY: F. FRIAR  
CHECKED BY: F. FRIAR  
DATE: 06-02-21

# SERVICE CALCULATION

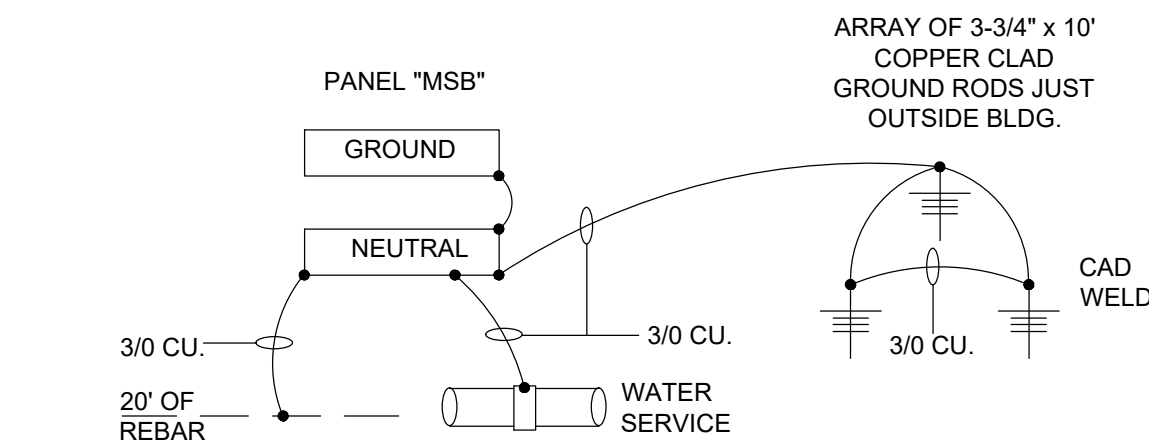
PROJECT:	LEDC SPEC 13	SERVICE VOLTAGE:	480/277V	
PROJECT NUMBER:		PHASE & WIRE:	3 PH 4W	
SERVICE DESIGNATION:	MSB	SERVICE SIZE (AMPS):	1600	
DESCRIPTION	LOAD	TOTAL LOAD (VA)	DEMAND FACTOR	TOTAL DEMAND (VA)
<b>OFFICE AREA (PROVISION FOR FUTURE)</b>				
LIGHTING	3200 ft <sup>2</sup> @ 3.5 VA/ft <sup>2</sup>	11,200	1.25	14,000
RECEPTACLES	3200 ft <sup>2</sup> @ 3 VA/ft <sup>2</sup>			
	FIRST 9600 VA		1.00	9,600
	REMAINDER 0 VA		0.50	0
HVAC EQUIPMENT	13 TONS @ 2160 VA/TON	28,080	1.00	28,080
<b>WAREHOUSE AREA</b>				
LIGHTING	60000 ft <sup>2</sup> @ 2 VA/ft <sup>2</sup>	120,000	1.25	150,000
RECEPTACLES	60000 ft <sup>2</sup> @ 1 VA/ft <sup>2</sup>			
	FIRST 10000 VA		1.00	10,000
	REMAINDER 50000 VA		0.50	25,000
EXTERIOR LIGHTING		9,600	1.25	12,000
AERIAL FEEDERS		332,400	1.00	332,400
MISC FANS AND MOTORS		24,556	1.00	24,556
CRANE		54,015	1.00	54,015
ELECTRIC HEATING CONTROLS		21,600	1.00	21,600
CONNECTED LOAD	681.25 KVA			819.4 A
FUTURE CAPACITY (25%)	170.31 KVA			204.9 A
TOTAL CALCULATED LOAD	851.56 KVA			1024.3 A
DATE:	6/2/2021			



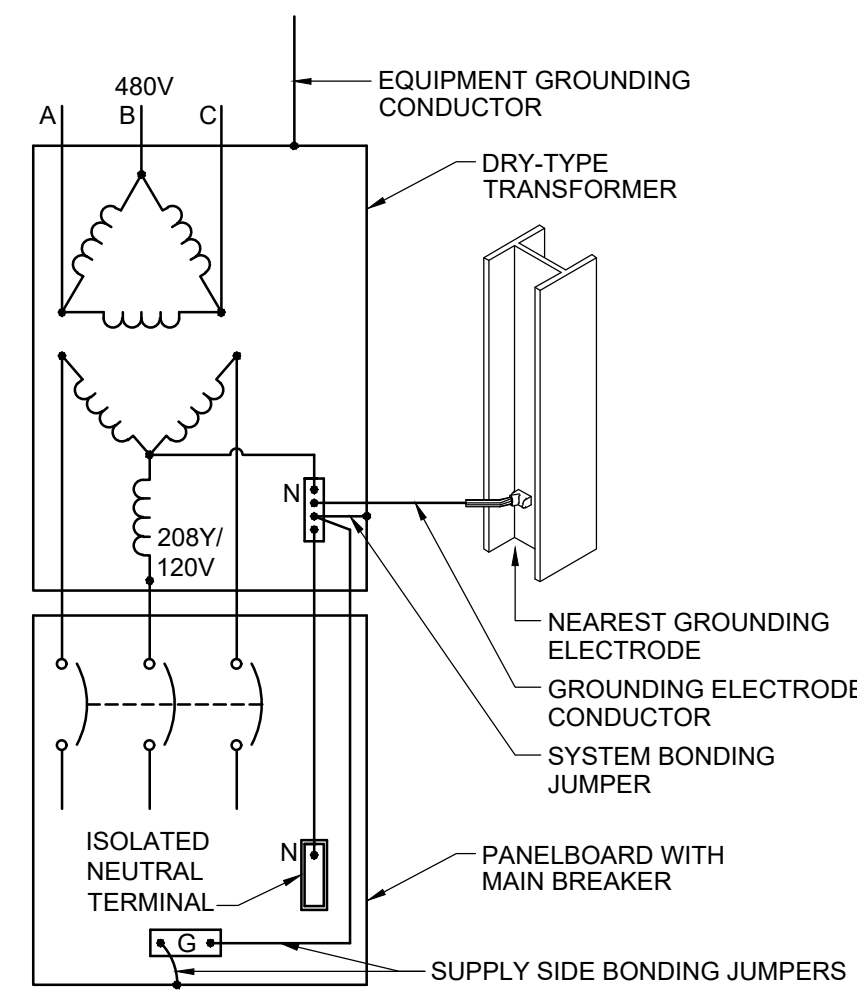
**POWER RISER DIAGRAM**  
SCALE: NO SCALE

## POWER RISER NOTES

1. PROVIDE METERING PER REQUIREMENTS OF POWER COMPANY.
2. (4) SETS OF (4) 600kcmil, EACH SET IN 4" PVC CONDUIT. INSTALL PER REQUIREMENTS OF POWER COMPANY.
3. #3/0 SERVICE GROUNDING ELECTRODE CONDUCTOR, WITH BONDING IN "MSB". REFER TO SERVICE GROUNDING DIAGRAM FOR ADDITIONAL INFORMATION.
4. (4) #4/0 AND (1) #4 G IN 2-1/2" CONDUIT.
5. (3) #1 AND (1) #5 G IN 1-1/2" CONDUIT.
6. #2 GROUNDING ELECTRODE CONDUCTOR TO NEAREST ELECTRODE. REFER TO TRANSFORMER GROUNDING DETAIL.
7. (4) #4/0 AND (1) #2 SUPPLY SIDE BONDING JUMPER IN 2-1/2" CONDUIT. REFER TO TRANSFORMER GROUNDING DETAIL.

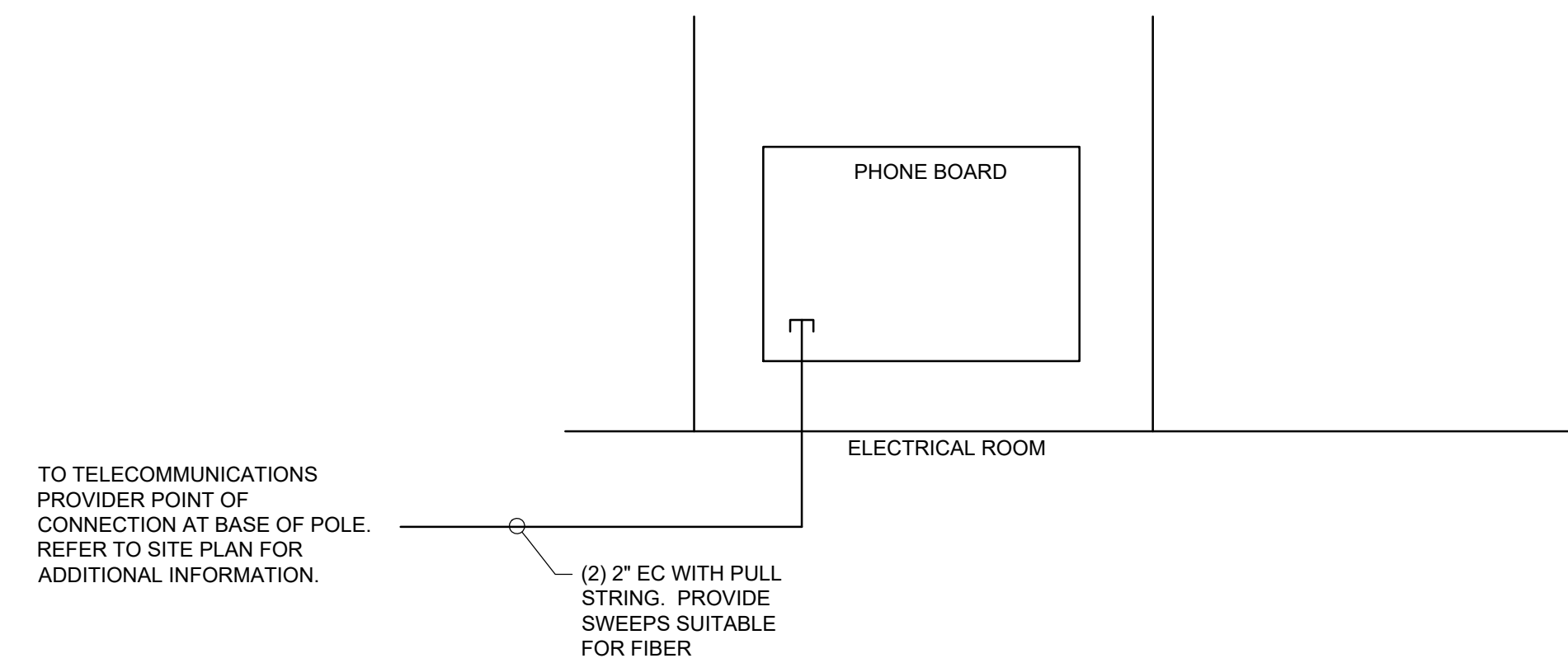


**SERVICE GROUNDING DIAGRAM**  
SCALE: NO SCALE

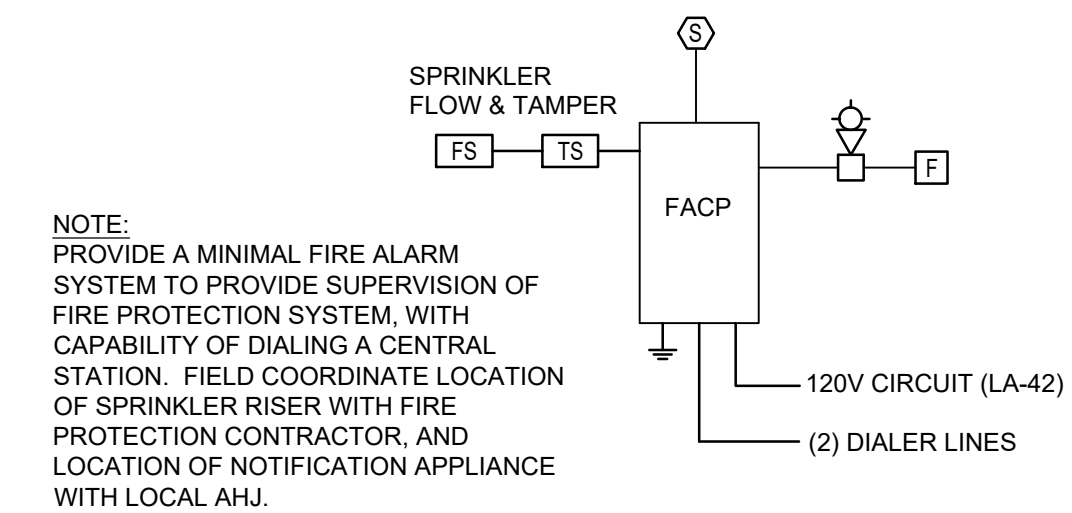


GROUNDING ARRANGEMENT FOR A SEPARATELY DERIVED SYSTEM WHERE THE GROUNDING ELECTRODE CONDUCTOR CONNECTION IS MADE AT THE TRANSFORMER. NOT VALID FOR SERVICE ENTRANCE TRANSFORMERS.

**TRANSFORMER GROUNDING DIAGRAM**  
SCALE: NO SCALE



**TELECOMMUNICATIONS RISER DIAGRAM**  
SCALE: NO SCALE



NOTE: PROVIDE A MINIMAL FIRE ALARM SYSTEM TO PROVIDE SUPERVISION OF FIRE PROTECTION SYSTEM, WITH CAPABILITY OF DIALING A CENTRAL STATION. FIELD COORDINATE LOCATION OF SPRINKLER RISER WITH FIRE PROTECTION CONTRACTOR, AND LOCATION OF NOTIFICATION APPLIANCE WITH LOCAL AHJ.

**FIRE ALARM RISER DIAGRAM**  
SCALE: NO SCALE



**FRED FRIAR, P.E.**  
CONSULTING ENGINEER

5732 ROUTE 152, LAVALETTE, WV 25535  
(304) 962-7006 | FRED@FRIARPE.COM

REV.	DESCRIPTION	DATE
	REVIEW SET	06-02-21
	PRICING SET	06-02-21

**SPEC 13 COMMERCE DRIVE**  
**LAWRENCE ECONOMIC DEVELOPMENT CORP.**

**RISER DIAGRAMS**

DRAWN BY: F. FRIAR  
CHECKED BY: F. FRIAR  
DATE: 06-02-21

NEW SWBD SERVICE ENTRANCE		MSB		VOLTAGE 480 / 277 V		SIZE 1600A MCB		CABINET SURFACE NEMA-1								
		PHASE 3 PH 4 W		1600A BUS		RATING 65,000		AIC RATED								
NOTES	REMARKS	CKT.BKR.	VA PHASE LOAD			CKT.#	BUS			CKT.#	VA PHASE LOAD			CKT.BKR.	REMARKS	NOTES
		AMPS	A	B	C	A	B	C	A	B	C	AMPS	P			
	SPARE	225	0	0	0	1	X	X	2					60	3	SPARE
	PANEL HA	225	15736	19302	14018	7	X	X	8	9552	6372	8172		225	3	PANEL HB
	SPARE	225				11	X	X	12					100	3	SPARE
	AERIAL FEEDER	250	55400	55400	55400	19	X	X	20	18005	18005			150	3	CRANE
	AERIAL FEEDER	250	55400	55400	55400	25	X	X	26					3	400A BUSSED PROV	
	100A BUSSED PROV	3	0	0	0	29	X	X	30					3	225A BUSSED PROV	
	60A BUSSED PROV	3	0	0	0	35	X	X	36					3	100A BUSSED PROV	
	TOTAL		126536	130102	124818	0			41	27557	24377	26177		TOTAL		

1. PROVIDE GROUND FAULT FOR MAIN BREAKER

TABULATION	TOTAL LOAD	DEMAND FACTOR	DEMAND LOAD
MEASURED	0	0.00	0
LIGHTING	22880	1.25	28600
COOLING	0	0.00	0
HEATING	0	0.00	0
RECEPTACLE	17700	0.78	13850
MISCELLANEOUS	417187	1.00	417187
KITCHEN EQUIP	0	0.00	0
LARGEST MOTOR	0	0.00	0
TOTAL DEMAND LOAD		459637 VA	
TOTAL DEMAND AMPS		552.9 A	

NOTES:  
1. CONTRACTOR IS RESPONSIBLE FOR UPDATING ALL PANEL SCHEDULES WITH CURRENT DESCRIPTIONS OF ALL BRANCH CIRCUIT DESIGNATIONS.

NEW PANEL		HA		VOLTAGE 480 / 277 V		SIZE 225A MLO		CABINET SURFACE NEMA-1								
		PHASE 3 PH 4 W		225A BUS		RATING 25,000		AIC RATED								
NOTES	REMARKS	CKT.BKR.	VA PHASE LOAD			CKT.#	BUS			CKT.#	VA PHASE LOAD			CKT.BKR.	REMARKS	NOTES
		AMPS	A	B	C	A	B	C	A	B	C	AMPS	P			
	OVERHEAD DOOR	15	582	582	582	1	X	X	2	942	942			15	3	EF-1
	DOCK LEVELER	15	582	582	582	7	X	X	8	138	138			20	2	PARKING LIGHTING
	OVERHEAD DOOR	15	582	582	582	11	X	X	12	790	790			20	2	WALLPACKS
	DOCK LEVELER	15	582	582	582	15	X	X	16	3456	3456			20	1	LIGHTING
	SPACE	1	0	0	0	17	X	X	18					20	1	LIGHTING
	SPACE	1	0	0	0	19	X	X	20	942	942			15	3	EF-3
	SPACE	1	0	0	0	21	X	X	22					20	1	LIGHTING
	SPACE	1	0	0	0	23	X	X	24					20	1	LIGHTING
	SPACE	1	0	0	0	25	X	X	26	3456	3456			20	1	LIGHTING
	SPACE	1	0	0	0	27	X	X	28					20	1	LIGHTING
	SPACE	1	0	0	0	29	X	X	30					1	SPACE	
	SPACE	1	0	0	0	31	X	X	32					1	SPACE	
	SPACE	1	0	0	0	33	X	X	34					1	SPACE	
	SPACE	1	0	0	0	35	X	X	36					1	SPACE	
	SPACE	1	0	0	0	37	X	X	38					1	SPACE	
	SPACE	1	0	0	0	39	X	X	40					1	SPACE	
	SPACE	1	0	0	0	41	X	X	42					1	SPACE	
	SPACE ONLY	3	0	0	0					7140	8040			125	3	75KVA FOR PANEL LA
	TOTAL		2328	2328	2328	0			41	13408	16974	11690		TOTAL		

TABULATION	TOTAL LOAD	DEMAND FACTOR	DEMAND LOAD
MEASURED	0	0.00	0
LIGHTING	21080	1.25	26350
COOLING	0	0.00	0
HEATING	0	0.00	0
RECEPTACLE	10140	0.99	10070
MISCELLANEOUS	16636	1.00	16636
KITCHEN EQUIP	0	0.00	0
LARGEST MOTOR	0	0.00	0
TOTAL DEMAND LOAD		53056 VA	
TOTAL DEMAND AMPS		63.8 A	

NOTES:  
1. CONTRACTOR IS RESPONSIBLE FOR UPDATING ALL PANEL SCHEDULES WITH CURRENT DESCRIPTIONS OF ALL BRANCH CIRCUIT DESIGNATIONS.

NEW PANEL		HB		VOLTAGE 480 / 277 V		SIZE 225A MLO		CABINET SURFACE NEMA-1								
		PHASE 3 PH 4 W		225A BUS		RATING 25,000		AIC RATED								
NOTES	REMARKS	CKT.BKR.	VA PHASE LOAD			CKT.#	BUS			CKT.#	VA PHASE LOAD			CKT.BKR.	REMARKS	NOTES
		AMPS	A	B	C	A	B	C	A	B	C	AMPS	P			
	OVERHEAD DOOR	15	582	582	582	1	X	X	2	942	942			15	3	EF-2
	DOCK LEVELER	15	582	582	582	7	X	X	8	942	942			15	3	EF-4
	OVERHEAD DOOR	15	582	582	582	11	X	X	12					20	1	SPARE
	DOCK LEVELER	15	582	582	582	13	X	X	14	0	0			20	1	SPARE
	SPACE	1	0	0	0	15	X	X	16					20	1	SPARE
	SPACE	1	0	0	0	17	X	X	18					20	1	SPARE
	SPACE	1	0	0	0	19	X	X	20	0	0			20	1	SPARE
	SPACE	1	0	0	0	21	X	X	22	0	0			20	1	SPARE
	SPACE	1	0	0	0	23	X	X	24	0	0			20	1	SPARE
	SPACE	1	0	0	0	25	X	X	26	0	0			1	SPACE	
	SPACE	1	0	0	0	27	X	X	28	0	0			1	SPACE	
	SPACE	1	0	0	0	29	X	X	30	0	0			1	SPACE	
	SPACE	1	0	0	0	31	X	X	32	0	0			1	SPACE	
	SPACE	1	0	0	0	33	X	X	34	0	0			1	SPACE	
	SPACE	1	0	0	0	35	X	X	36	0	0			1	SPACE	
	SPACE	1	0	0	0	37	X	X	38	0	0			1	SPACE	
	SPACE	1	0	0	0	39	X	X	40	0	0			1	SPACE	
	SPACE	1	0	0	0	41	X	X	42	0	0			1	SPACE	
	SPACE ONLY	3	0	0	0					5340	2160			125	3	75KVA FOR PANEL LB
	TOTAL		2328	2328	2328	0			41	7224	4044	3960		TOTAL		

TABULATION	TOTAL LOAD	DEMAND FACTOR	DEMAND LOAD
MEASURED	0	0.00	0
LIGHTING	1800	1.25	2250
COOLING	0	0.00	0
HEATING	0	0.00	0
RECEPTACLE	7560	1.00	7560
MISCELLANEOUS	14136	1.00	14136
KITCHEN EQUIP	0	0.00	0
LARGEST MOTOR	0	0.00	0
TOTAL DEMAND LOAD		23946 VA	
TOTAL DEMAND AMPS		28.8 A	

NOTES:  
1. CONTRACTOR IS RESPONSIBLE FOR UPDATING ALL PANEL SCHEDULES WITH CURRENT DESCRIPTIONS OF ALL BRANCH CIRCUIT DESIGNATIONS.

NEW PANEL		LA		VOLTAGE 208 / 120 V		SIZE 225A MCB		CABINET SURFACE NEMA-1								
		PHASE 3 PH 4 W		225A BUS		RATING 22,000		AIC RATED								
NOTES	REMARKS	CKT.BKR.	VA PHASE LOAD			CKT.#	BUS			CKT.#	VA PHASE LOAD			CKT.BKR.	REMARKS	NOTES
		AMPS	A	B	C	A	B	C	A	B	C	AMPS	P			
	RECEPTACLES	20	1	1080		1	X	X	2	600				20	1	RADIANT HEAT
	RECEPTACLES	20	1	1080		3	X	X	4	1500				20	1	PHONE BOARD
	RECEPTACLES	20	1	1080	1080	5	X	X	6	1800				20	1	DOCK LIGHTINGS
	RECEPTACLES	20	1	1080		7	X	X	8	1500				20	1	DOCK CONTROLS
	RECEPTACLES	20	1	1080		9	X	X	10	1800				20	1	SIGN
	RECEPTACLES	20	1	1080	1080	11	X	X	12	600				20	1	RADIANT HEAT
	RECEPTACLES	20	1	1080		13	X	X	14	1800				20	1	DOCK LIGHTING
	RECEPTACLES	20	1	1080		15	X	X	16	1500				20	1	DOCK CONTROLS
	SPARE	20	1			17	X	X	18					20	1	SPARE
	SPARE	20	1	0		19	X	X	20	0				20	1	SPARE
	SPARE	20	1	0		21	X	X	22	0				20	1	SPARE
	SPARE	20	1	0		23	X	X	24	0				20	1	SPARE
	SPARE	20	1	0		25	X	X	26	0				20	1	SPARE
	SPARE	20	1	0		27	X	X	28	0				20	1	SPARE
	SPARE	20	1	0		29	X	X	30	0				20	1	SPARE
	SPARE	20	1	0		31	X	X	32	0				20	1	SPARE
	SPARE	20	1	0		33	X	X	34	0				20	1	SPARE
	SPARE	20	1	0		35	X	X	36	0				20	1	SPARE
	SPACE	1	0	0		37	X	X	38	0				1	SPACE	
	SPACE	1	0	0		39	X	X	40	0				1	SPACE	
	SPACE	1	0	0		41	X	X	42	1000				20	1	FACP
	TOTAL		3240	3240	2160	0			41	3900	4800	3400		TOTAL		

LD - PROVIDE "LOCK ON" DEVICE

TABULATION	TOTAL LOAD	DEMAND FACTOR	DEMAND LOAD
MEASURED	0	0.00	0
LIGHTING	5400	1.25	6750
COOLING	0	0.00	0
HEATING	1200	1.00	1200
RECEPTACLE	10140	0.99	10070
MISCELLANEOUS	400		