

ELECTRICAL SYMBOL LEGEND (SYMBOLS ARE STANDARD AND MAY NOT ALL BE USED FOR EVERY PROJECT)					
	SINGLE FACE EXIT SIGN	s	SINGLE POLE SWITCH		PANEL - 120/208V
	DOUBLE FACE EXIT SIGN	S ₃	THREE WAY SWITCH		PANEL - 277/480V
	EMERGENCY BATTERY UNIT	S ₄	FOUR WAY SWITCH		PANEL - 120/240V
	SINGLE / DUAL HEAD REMOTE LAMP	S ₀	DIMMER SWITCH		TRANSFORMER
	2'X2' RECESSED VOLUMETRIC LIGHT FIXTURE / WITH EMERGENCY	S ₃₀	THREE WAY DIMMER SWITCH		CEILING MOUNTED CORD REEL
	2'X4' RECESSED VOLUMETRIC LIGHT FIXTURE / WITH EMERGENCY	S ₁	LOW VOLTAGE SWITCH SENSOR SWITCH SPODM		CEILING MOUNTED CORD DROP
	2'X4' RECESSED PRISMATIC LENS LIGHT FIXTURE / WITH EMERGENCY	S _M	MOMENTARY CONTACT SWITCH		POWER POLE
	2'X2' RECESSED PRISMATIC LENS LIGHT FIXTURE / WITH EMERGENCY		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR		JUNCTION BOX
	STRIP LIGHT FIXTURE / WITH EMERGENCY		WS MOUNTED, DT, OS SENSOR SWITCH W5X-PDT		NON-FUSED DISCONNECT SWITCH
	ROUND DECORATIVE PENDANT LIGHT FIXTURE		WALL SWITCH MOUNTED PASSIVE INFRARED OCCUPANCY SENSOR		FUSED DISCONNECT SWITCH
	DECORATIVE PENDANT LIGHT FIXTURE		CM, DT, OS SENSOR SWITCH CM-PDT		COMBINATION STARTER DISCONNECT SWITCH
	INDUSTRIAL PENDANT LIGHT FIXTURE / WITH EMERGENCY		CEILING MOUNTED PASSIVE INFRARED OCCUPANCY SENSOR		STARTER
	ROUND RECESSED DOWNLIGHT / WITH EMERGENCY		JUNCTION BOX WITH LOW VOLTAGE POWER SUPPLY FOR OCCUPANCY SENSORS		GROUND ROD
	SQUARE RECESSED DOWNLIGHT / WITH EMERGENCY		LIGHTING EMERGENCY RELAY		MOTOR
	LINEAR PENDANT LIGHT FIXTURE		PHOTOCELL		LINE VOLTAGE THERMOSTAT
	WALL MOUNTED LIGHT FIXTURE		LIGHTING CONTROL PANEL		MOTOR OPERATED DAMPER
	EXTERIOR WALL PACK		TIME CLOCK		PUSH BUTTON
	SINGLE POLE MOUNTED AREA LIGHT FIXTURE		CONTACTOR - SIZE & TYPE AS NOTED		MANUAL MOTOR STARTER SWITCH
	DOUBLE POLE MOUNTED AREA LIGHT FIXTURE		30A MANUAL MOTOR STARTER SWITCH		CABLE TV OUTLET WITH 3/4\"/>
	TRIPLE POLE MOUNTED AREA LIGHT FIXTURE		DOCUMENT BOX		POE WIRELESS ACCESS POINT
	QUAD POLE MOUNTED AREA LIGHT FIXTURE		CEILING CHORD REEL		

SECTION 26000 - ELECTRICAL

1. GENERAL SCOPE AND CONDITIONS

A. FURNISH ALL LABOR AND MATERIALS REQUIRED TO COMPLETE ALL WORK IN BUILDING INCLUDING LIGHTING, POWER, OUTLETS FOR SYSTEMS AND SERVICES.

B. EC SHALL FURNISH TOOLS, LABOR AND MATERIAL REQUIRED COMPLETING THE WORK DESCRIBED AND OUTLINED IN THE ELECTRICAL CONTRACT, INCLUDING BUT NOT LIMITED TO THE CONSTRUCTION AND INSTALLATION OF ELECTRICAL POWER AND LIGHTING SYSTEMS. BEFORE ORDERING ANY EQUIPMENT OR MATERIALS, VERIFY ALL CRITICAL DIMENSIONS, ELECTRICAL RATINGS, ENVIRONMENTAL CONSIDERATIONS AND LOCATION AS PERTAINING TO THE USE AND INSTALLATION OF EQUIPMENT OR CONSTRUCTION OF THE PROJECT.

C. EQUIPMENT, FIXTURES, DEVICES, MATERIAL SHEETS, CATALOG OR MANUFACTURERS REFERENCE USED IN DESCRIBING AN ITEM IS MERELY DESCRIPTIVE AND NOT RESTRICTIVE UNLESS OTHERWISE NOTED. ELECTRICAL CONTRACTOR SHALL CLEARLY IDENTIFY THE PROPOSED PRODUCT, MODEL, TYPE AND DISCRETION AS TO THE ACCEPTANCE AND APPLICATION.

D. ALL ELECTRICAL MATERIALS SHALL BE NEW AND SHALL BE LISTED BY THE UNDERWRITERS LABRATORIES, INC. (UL). DEFECTIVE EQUIPMENT OR EQUIPMENT DAMAGED IN THE COURSE OF INSTALLATION OR TEST SHALL BE REPLACED OR REPAIRED IN A MANNER MEETING THE APPROVAL OF THE ARCHITECT AND ENGINEER. WHERE APPLICABLE, ALL EQUIPMENT SHALL BE IN ACCORDANCE WITH NEMA STANDARDS.

E. ALL WORK SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER OR HIS AUTHORIZED REPRESENTATIVE.

2. SITE VISIT AND EXISTING CONDITIONS

A. ELECTRICAL CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE SITE AND EXAMINE THE SAME TO BE SATISFIED AS TO THE EXTENT OF THE WORK AND CONDITIONS UNDER WHICH THEY ARE OBLIGATED TO PERFORM THE WORK. NO ADDITIONAL COMPENSATION WILL BE ALLOWED BY FAILURE TO DETERMINE ACTUAL CONDITIONS.

3. SUBMITTALS

A. EC SHALL SUBMIT TO ENGINEER FOR REVIEW SUBMITTALS ON LIGHT FIXTURES, LIGHTING CONTROLS, WIRING, WIRING DEVICES, TRANSFORMERS, DISCONNECT SWITCHES.

B. ENGINEER WILL CONSIDER CONTRACTOR SUBSTITUTIONS IF THEY ARE CLEARLY DELINEATED AS SUCH. ENGINEER CANNOT BE RESPONSIBLE FOR IDENTIFYING ALL SUBSTITUTIONS OR DEVIATIONS FROM THE CONTRACT DOCUMENTS, UNLESS SPECIFICALLY NOTED AS SUCH IN WRITING.

4. RECORD DRAWINGS

A. THE ELECTRICAL CONTRACTOR SHALL MAINTAIN AT THE SITE FOR THE OWNER, ONE COPY OF ALL DRAWINGS, ADDENDA, APPROVED SHOP DRAWINGS, REVISIONS AND OTHER MODIFICATIONS, IN GOOD ORDER AND MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION. THE REDLINE SET OF DRAWINGS AND OTHER INFORMATION SHALL BE DELIVERED TO THE OWNER UPON COMPLETION OF WORK.

5. GUARANTEE

A. THE ELECTRICAL CONTRACTOR SHALL LEAVE THE ENTIRE ELECTRICAL SYSTEM INSTALLED UNDER THIS CONTRACT IN PROPER WORKING ORDER AND SHALL, WITHOUT CHARGE, REPLACE ANY WORK OR MATERIALS WHICH DEVELOPE DEFECTS, EXCEPT FROM ORDINARY WEAR AND TEAR, WITHIN ONE YEAR FROM THE DATE OF FINAL ACCEPTACNCE. BENEFICIAL USE SHALL NOT BE CONSTRUED AS FINAL ACCEPTANCE.

B. THE ELECTRICAL CONTRACTOR SHALL, DURING THE ONE YEAR GUARANTEE PERIOD, BE RESPONSIBLE FOR THE PROPER REPAIR AND ADJUSTMENTS OF ALL ELECTRICAL, SYSTEMS AND EQUIPMENT, APPARATUS, DEVICES, ETC., INSTALLED BY HIM, AND DO ALL WORK NECESSARY TO ENSURE EFFICIENT AND PROPER FUNCTIONING.

C. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR, AND INCUR FINANCIAL RESPONSIBILITY FOR ANY DAMAGES CAUSED BY, OR FROM, DEFECTS IN HIS WORK.

6. PERMITS AND INSPECTIONS

A. GIVE ALL NECESSARY NOTICES AND OBTAIN ALL REQUIRED PERMITS. PAY ALL FEES AND OTHER COSTS. FILE ALL NECESSARY PLANS. PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AGENCIES HAVING JURISDICTION. OBTAIN ALL REQUIRED CERTIFICATIONS OF INSPECTION AND DELIVER SAME TO THE ARCHITECT.

7. COORDINATION

A. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ENTIRE BID DOCUMENT SET, I.E. IF WORK IS SHOWN ON OTHER TRADE DRAWINGS AS BY ELECTRICAL CONTRACTOR, ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR THAT WORK. WHERE A CONFLICT EXIST BETWEEN DRAWINGS IMMEDIATELY CONTACT ARCHITECT AND ENGINEER FOR DIRECTION BEFORE PROCEEDING WITH INSTALLATION OF WORK.

B. COORDINATE LOCATION OF CONDUIT AND EQUIPMENT/DEVICES WITH OTHER TRADES INCLUDING ARCHITECTURAL DETAILS.

C. ALL POWER WIRING FOR HVAC AND PLUMBING EQUIPMENT, INCLUDING POWER WIRING THROUGH CONTROL DEVICES SUCH AS MOTOR STARTERS, LINE VOLTAGE SWITCHES AND THERMOSTATS, DISCONNECT SWITCHES, ETC, SHALL BE FURNISHED AND INSTALLED UNDER ELECTRICAL PORTION OF CONTRACT. UNLESS NOTED OTHERWISE. ALL CONTROL DEVICES AND CONTROL WIRING FOR HVAC AND PLUMBING EQUIPMENT WILL BE FURNISHED AND INSTALLED UNDER HVAC AND PLUMBING PORTION OF CONTRACT. FINAL CONNECTION OF ALL POWER WIRING SHALL BE PERFORMED UNDER PORTION OF CONTRACT FURNISHING EQUIPMENT. FINAL CONNECTION OF ALL CONTROL WIRING WILL BE PERFORMED UNDER PORTION OF CONTRACT FURNISHING EQUIPMENT. FINAL CONNECTIONS TO MECHANICAL EQUIPMENT

SHALL BE MADE WITH FLEX CONNECTORS.

D. EXACT LOCATION OF ALL HVAC AND PLUMBING EQUIPMENT SHALL BE DETERMINED IN FIELD. COORDINATE WITH HVAC AND PLUMBING CONTRACTOR BEFORE ROUGH WIRING IS STARTED.

8. CODES AND STANDARDS

A. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE MOST RECENTLY ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE.

B. THE INSTALLATION MUST COMPLY WITH ALL FEDERAL, STATE, MUNICIPAL OR OTHER AUTHORITY'S LAWS, RULES, OR REGULATIONS.

9. CUTTING AND PATCHING

A. ALL CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OF THE ELECTRICAL WORK SHALL BE DONE BY THE ELECTRICAL CONTRACTOR. ANY DAMAGE DONE TO THE WORK ALREADY IN PLACE BY REASON OF THIS WORK SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. PATCHING SHALL BE UNIFORM IN APPEARANCE AND SHALL MATCH WITH THE SURROUNDING SURFACE.

B. EXCAVATION AND BACKFILL FOR EXTERIOR UNDERGROUND CONDUITS SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR.

10. IDENTIFICATION

A. PERMANENTLY IDENTIFY ALL DISCONNECTS SWITCHES, CONTROLS, PANELBOARDS, TRANSFORMERS AND OTHER EQUIPMENT IN ACCORDANCE WITH THE PROJECT NOMENCLATURE. IDENTIFICATION PLATES SHALL BE LAMINATED PLASTIC, BLACK WITH WHITE ENGRAVED LETTERS. UNLESS OTHERWISE INDICATED, USE 1/4" HIGH LETTERING. LETTERING FOR CONTROL CENTERS, CONTROL PANELS, METERING AND INSTRUMENT PANELS SHALL BE 3/8" HIGH. ATTACH IDENTIFICATION PLATES WITH CORROSION RESISTANT PHILLIPS HEAD STEEL SCREWS OR ADHESIVE APPROVED FOR THE PURPOSE.

B. APPLY IDENTIFICATION OF CIRCUIT NUMBERS FOR SWITCHES AND RECEPTACLES ON THE INSIDE COVER PLATE WITH ADHESIVE LABELS. HANDWRITTEN LABELS WILL NOT BE ACCEPTABLE.

C. APPLY IDENTIFICATION OF CIRCUIT NUMBERS ON THE WIRE WITH ADHESIVE LABELS IN JUNCTION BOXES, DEVICE BOXES, AND IN THE PANEL.

D. PROVIDE TYPED PANELBOARD SCHEDULE INSIDE DOOR OF PANELBOARD WITH NUMBERS CORRESPONDING WITH BREAKER NUMBERS. PROVIDE TYPED SOURCE OF SUPPLY LABEL FOR EACH SWITCHBOARD, SWITCHGEAR AND PANELBOARD INDICATING EACH DEVICE OR EQUIPMENT WHERE THE POWER ORIGINATED. PANELBOARD SCHEDULES AND SOURCE SUPPLY LABELS, CIRCUIT DIRECTORY OR CIRCUIT IDENTIFICATION SHALL BE COMPLETED AS REQUIRED BY NEC ARTICLE 408.4

11. TEST

A. FURNISH ALL LABOR, MATERIAL, INSTRUMENTS, FUEL AND POWER REQUIRED TO PERFORM ALL NECESSARY TEST. PERFORM TEST ACCORDING TO NETA STANDARDS. ALL DEFECTIVE MATERIALS AND/OR WORKMANSHIP DISCOVERED AS A RESULT OF TESTS SHALL BE REPLACED AT NO EXPENSE TO THE OWNER AND THE TEST SHALL BE REPEATED. A THOROUGH TEST SHALL BE MADE TO DEMONSTRATE THAT THE SYSTEM IS FREE FROM GROUND FAULTS, SHORT CIRCUITS, BEFORE AND AFTER CONNECTION OF EQUIPMENT MEETS THE REQUIREMENTS OF THE NEC.

B. EC SHALL TEST ALL ELECTRICAL CONDUCTORS TO INSURE PROPER INSTALLATION AND CONTINUITY. TESTING SHALL BE PERFORMED BY A QUALIFIED PROFESSIONAL WORKING WITHIN THE FIELD USING UP TO DATE TESTING EQUIPMENT. TESTING SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER.

12. RACEWAYS, BOXES, WIRING, FITTINGS, AND SUPPORTS

A. BRANCH WIRING SHALL BE TYPE THHN/THWN IN E.M.T. WITH COMPRESSION FITTINGS UNLESS NOTED OTHERWISE. MC CABLE MAY BE INSTALLED CONCEALED IN WALLS. BETWEEN LIGHT FIXTURES IN ROOMS WHERE ALLOWED BY CODE. MC CABLE SHALL NOT BE INSTALLED AS HOMERUNS FOR BRANCH CIRCUITS.

B. PANEL FEEDERS SHALL BE IN EMT CONDUIT WITH COMPRESSIONS FITTINGS. WIRE SHALL NOT BE SMALLER THAN #12. ALL WIRING UNDERGROUND AND IN WET LOCATIONS SHALL BE XHHW-2. ALL CIRCUITS SHALL HAVE SEPARATE GROUND WIRE. ALL WIRING IN THIS CONTRACT SHALL BE IN CONDUIT IN PLENUMS UNLESS NOTED OTHERWISE. ANY CABLES INSTALLED IN PLENUMS SHALL BE PLENUM RATED.

C. WIRING SHALL BE COPPER. ALUMINUM WILL NOT BE ACCEPTABLE. ALUMINUM WILL BE ACCEPTED FOR PANEL FEEDERS ONLY. MINIMUM SIZE E.M.T. CONDUIT SHALL BE 3/4". POWER WIRING #14 THROUGH #1 SHALL BE RATED AT 60 DEGREES C. ALL OTHER WIRING SHALL BE RATED AT 75 DEGREES C.

D. ANY CONDUIT SHOWN TO BE INSTALLED WITHIN AN EXTERIOR WALL MUST BE INSTALLED ON THE INTERIOR SIDE OF THE WALL INSULATION.

E. DO NOT USE CONDUIT AND ASSOCIATED FITTINGS FOR APPLICATIONS OTHER THAN AS PERMITTED BY NFPA 70 AND PRODUCT LITERATURE. UNLESS OTHERWISE INDICATED AND WHERE NOT OTHERWISE RESTRICTED, USE THE CONDUIT TYPE INDICATED FOR THE SPECIFIED APPLICATION. WHERE MORE THAN ONE LISTED APPLICATION APPLIES, COMPLY WITH THE MOST RESTRICTIVE REQUIREMENTS. WHERE CONDUIT TYPE FOR A PARTICULAR APPLICATION IS NOT SPECIFIED, USE GALVANIZED STEEL RIGID METAL CONDUIT.

CONDUIT APPLICATIONS:

- UNDERGROUND:
 - UNDER SLAB ON GRADE: USE GALVANIZED STEEL RIGID METAL CONDUIT (RGS), INTERMEDIATE METALLIC CONDUIT (IMC), OR RIGID PVC CONDUIT.
 - EXTERIOR, DIRECT-BURIED: USE GALVANIZED STEEL RIGID METAL CONDUIT (RGS), INTERMEDIATE METALLIC CONDUIT (IMC), OR RIGID PVC CONDUIT.
 - WHERE RIGID POLYVINYL (PVC) CONDUIT IS PROVIDED, TRANSITION TO GALVANIZED STEEL RIGID METAL CONDUIT WHERE EMERGING FROM UNDERGROUND.
 - WHERE RIGID POLYVINYL (PVC) CONDUIT LARGER THAN 2 INCH TRADE SIZE IS PROVIDED, USE GALVANIZED STEEL RIGID METAL CONDUIT ELBOWS FOR BENDS.
 - WHERE RIGID POLYVINYL (PVC) CONDUIT IS DIRECT-BURIED INSTALLED UNDER NON-PAVED SURFACE SHALL BE PVC SCHEDULE 40 CONDUIT AND CONDUIT UNDER PAVED SURFACES SHALL

ELECTRICAL ABBREVIATIONS			
A	AMPERES	LC	LIGHTING CONTACTOR
AC	ALTERNATING CURRENT	MFR	MANUFACTURER
AFF	ABOVE FINISHED FLOOR	MH	MANHOLE
AFG	ABOVE FINISHED GRADE	MOD	MOTOR OPERATED DAMPER
AL	ALUMINUM	NL	NIGHT LIGHT
ATS	AUTOMATIC TRANSFER SWITCH	NO	NUMBER
BFG	BELOW FINISHED GRADE	OS	OCCUPANCY SENSOR
BLDG	BUILDING	P	POLE
C	CONDUIT	PC	PHOTO CELL
CTR	COUNTERTOP MOUNTED	PH	PHASE
CM	CEILING MOUNT	PRI	PRIMARY
DC	DIRECT CURRENT	RS	RIGID STEEL
DT	DUAL TECHNOLOGY	SCH	SCHEDULE
DISC	DISCONNECT	SEC	SECONDARY
DWG	DRAWING	SHLD	SHIELDED
EF	EXHAUST FAN	SN	SOLID NEUTRAL
EH	ELECTRIC HEATER	SS	STAINLESS STEEL
EX	EXISTING	SW	SWITCH
F	FUSE	T	TOE SPACE MOUNTED
FLA	FULL LOAD AMPS	TYP	TYPICAL
GFI	GROUND FAULT INTERRUPTER	V	VOLTS
GRD	GROUND	VFD	VARIABLE FREQUENCY DRIVE
H	HIGH	W	WATTS, WIDE
HP	HORSEPOWER	WP	WEATHERPROOF
KW	KILOWATTS	XFMR	TRANSFORMER

BE PVC SCHEDULE 80 CONDUIT.

2) CONCEALED WITHIN MASONRY WALLS: USE GALVANIZED STEEL RIGID METAL CONDUIT (RGS) OR INTERMEDIATE METAL CONDUIT (IMC).

3) CONCEALED WITHIN HOLLOW STUD WALLS: USE GALVANIZED STEEL RIGID METAL CONDUIT (RGS), INTERMEDIATE METAL CONDUIT (IMC), ELECTRICAL METALLIC TUBING (EMT) OR MC CABLE WHERE ALLOWED BY CODE.

4) CONCEALED ABOVE ACCESSIBLE CEILINGS: USE GALVANIZED STEEL RIGID METAL CONDUIT (RGS), INTERMEDIATE METAL CONDUIT (IMC), ELECTRICAL METALLIC TUBING (EMT) OR MC CABLE WHERE ALLOWED BY CODE.

5) EXPOSED, INTERIOR, NOT SUBJECT TO PHYSICAL DAMAGE: USE GALVANIZED STEEL RIGID METAL CONDUIT (RGS), INTERMEDIATE METAL CONDUIT (IMC), ELECTRICAL METALLIC TUBING (EMT).

6) EXPOSED, EXTERIOR: USE GALVANIZED STEEL RIGID METAL CONDUIT (RGS) OR INTERMEDIATE METAL CONDUIT (IMC).

7) CONNECTION TO LUMINAIRES ABOVE ACCESSIBLE CEILINGS: MC CABLE WHERE ALLOWED BY CODE.

8) CONNECTION TO VIBRATING EQUIPMENT:

- DRY LOCATIONS: USE FLEXIBLE METAL CONDUIT.
- DAMP, WET, OR CORROSIVE LOCATIONS: USE LIQUIDTIGHT FLEXIBLE METAL CONDUIT.
- MAXIMUM LENGTH: 6 FEET UNLESS OTHERWISE INDICATED.
- VIBRATING EQUIPMENT INCLUDES, BUT NOT LIMITED TO TRANSFORMERS AND MOTORS.

F. SUPPORT ALL CONDUITS PER THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

G. EMPTY RACEWAYS INSTALLED BY THE EC SHALL INCLUDE A NYLON PULL STRING WITH A BREAKING STRENGTH OF NOT LESS THAN 200 POUND-FORCE. EMPTY CONDUITS INSTALLED AS RACEWAYS FOR LOW VOLTAGE WIRING AND TERMINATED ABOVE A CEILING OR IN A WALL CAVITY WITHOUT A BOX SHALL INCLUDE PUSH ON PLASTIC BUSHINGS AT EACH END AND A NYLON PULL STRING.

H. PROVIDE AT EACH OUTLET OR DEVICE AN OUTLET BOX IN WHICH RACEWAYS AND CONDUCTORS SHALL TERMINATE. OUTLET BOXES SHALL BE STANDARD GALVANIZED STEEL PROVIDED WITH KNOCK-OUTS. WHERE GROUPED SWITCHES OR RECEPTACLES ARE SHOWN, USE GANG BOXES. ALL JUNCTION BOXES SHALL BE PROVIDED WITH A BLANK COVER PLATE. COORDINATE RECESSED BOX PLASTER RING DEPTH WITH ARCHITECTURAL DRAWINGS.

I. ALL PENETRATIONS THROUGH FIRE RATED WALL, FLOORS, AND CEILINGS SHALL BE SEALED WITH A SEALANT RATED FOR ITS USE. ALL OUTLETS BOXES SHALL HAVE COVERS. OUTLET BOXES INSTALLED IN FIRE RATED WALLS SHALL INCLUDE RATED PUTTY PACKS INSTALLED ON THE BOXES.

J. ALL RECEPTACLES SHALL BE MOUNTED 20" ABOVE FINISHED FLOOR TO TOP OF BOX (18" ABOVE FINISHED FLOOR TO CENTER OF BOX) UNLESS OTHERWISE NOTED.

K. COUNTER MOUNTED RECEPTACLES SHALL BE MOUNTED AT HEIGHT AS REQUIRED.

L. LIGHTING CONTROL SWITCHES SHALL BE MOUNTED 44" AFF TO TOP OF BOX UNLESS OTHERWISE NOTED.

13. GROUNDING

A. ALL GROUNDING AND BONDING SHALL COMPLY WITH ARTICLE 250 OF THE CURRENT ADDITION OF NATIONAL ELECTRICAL CODE.

B. ALL RACEWAYS SHALL BE PROVIDED WITH A GREEN INSULATED GROUND SIZED TO THE LARGEST CIRCUIT INSTALLED IN THE CONDUIT.

C. BONDING JUMPERS, WITH APPROVED GROUND FITTINGS, SHALL BE INSTALLED AT ALL RACEWAYS. EQUIPMENT ENCLOSURES, PULL BOXES, ETC., TO MAINTAIN GROUND CONTINUITY, WHERE REQUIRED BY CODE.

D. EACH OUTLET, DEVICE, OR JUNCTION BOX SHALL INCLUDE A GREEN LISTED GROUND SCREW.

E. REFER TO SERVICE GROUND DETAIL FOR GROUNDING ELECTRICAL CONDUCTOR, MAIN BONDING JUMPER, AND EQUIPMENT GROUNDING CONDUCTOR INSTALLATION REQUIREMENTS.

14. WIRING DEVICES

A. DUPLEX INDOOR RECEPTACLES SHALL BE 20A-120V-UL LISTED, COMMERCIAL SPECIFICATION GRADE AS MANUFACTURED BY HUBBELL #58S120 OR SIMILAR BY LEVITON, A&H, P&S, BRYANT OR EAGLE. EACH RECEPTACLE SHALL BE EQUIPPED WITH A PLASTIC WALL PLATE. (COLOR TO BE SELECTED BY THE ARCHITECT AND TO MATCH DEVICE).

B. DUPLEX INDOOR AND OUTDOOR G.F.I. RECEPTACLES SHALL BE 20A-120V-UL LISTED. RECEPTACLES SHALL BE USED AS END-OF-LINE TYPE. FEED THRU TYPE WILL NOT BE ACCEPTABLE. EACH OUTDOOR RECEPTACLE SHALL BE EQUIPPED WITH A WEATHERPROOF WHILE-IN-USE COVER. OUTLET BOX HOOD SHALL BE EXTRA DUTY. INTERIOR RECEPTACLES SHALL BE HUBBELL #GFTWRST20 AND EXTERIOR RECEPTACLES SHALL BE HUBBELL #GFTWRST20 WEATHER RESISTANT OR SIMILAR BY LEVITON, A&H, P&S, BRYANT OR EAGLE. EXTERIOR RECEPTACLES SHALL BE WEATHER RESISTANT RATED, "WR". OUTLET BOX HOOD SHALL BE LISTED AS "EXTRA DUTY". GFCI PROTECTED RECEPTACLES SHALL BE READILY ACCESSIBLE TO COMPLY WITH NEC ARTICLE 210.8. IF NOT READILY ACCESSIBLE GFI BREAKERS SHALL BE USED.

C. LIGHTING CONTROL SWITCHES SHALL BE 20A-120V-UL LISTED. COMMERCIAL SPECIFICATION GRADE AS MANUFACTURED BY HUBBELL #58S120 SERIES OR SIMILAR BY LEVITON, A&H, P&S, BRYANT OR EAGLE. EACH SWITCH SHALL BE EQUIPPED WITH A PLASTIC WALL PLATE. (COLOR TO BE SELECTED BY THE ARCHITECT AND TO MATCH DEVICE). SURFACE MOUNTED BOXES SHALL BE EQUIPPED WITH A RAISED METAL COVER PLATE.

D. OCCUPANCY SENSORS SHALL BE AS REQUIRED FOR THE INTENDED AREAS SHOWN ON THE DRAWINGS BY SENSOR SWITCH (BASIS OF DESIGN) OR SIMILAR BY LEVITON, LUTRON OR WATT STOPPER. EC IS RESPONSIBLE FOR ADEQUATE DEVICE QUANTITIES AND LAYOUT TO PROVIDE FOR PROPER OPERATION OF THE SENSORS TO MATCH MANUFACTURERS REQUIREMENTS.

E. PHOTOELECTRIC CELLS SHALL HAVE RATING OF 2000 WATTS AT 120 VOLTS. UNITS SHALL BE WEATHERPROOF, WITH ADJUSTABLE SLIDE AND DIE CAST ALUMINUM HOUSING. PHOTOELECTRIC CELLS SHALL BE HERMETICALLY SEALED AND TAMPER PROOF. PHOTOELECTIC CELLS SHALL BE MANUFACTURED BY TORK #3 100, PARAGON OR INTERMATIC.

F. MOTOR OPERATED TIME SWITCHES SHALL BE BY PARAGON, INTERMATIC OR SANGAMO. TIME SWITCHES SHALL HAVE ASTRONOMICAL DIALS. 365 DAY TYPE WITH HOLIDAY SCHEDULING AND RESERVE POWER

FEATURE.

15. SAFETY SWITCH

A. ALL SAFETY SWITCHES SHALL BE SIZE AND NEMA ENCLOSURE AS STATED ON DRAWINGS.

B. SWITCHES SHALL BE QUICK MAKE, QUICK BREAK, HEAVY OR GENERAL DUTY AS SPECIFIED ON THE DRAWINGS. SAFETY SWITCHES SHALL HAVE MECHANICAL LUGS SUITABLE FOR COPPER CONDUCTORS AND SHALL COMPLY WITH UL98 AND NEMA KS-1.

C. FUSED SAFETY SWITCHES RATED FOR 30A TO 800A SHALL BE EQUIPPED WITH CLASS R FUSE CLIPS AND SHALL HAVE R FUSE REJECTION CAPABILITY.

D. ENCLOSURE SHALL BE NEMA 1 FOR INDOOR INSTALLATIONS AND NEMA 3R FOR EXTERIOR INSTALLATIONS. ENCLOSURE SHALL HAVE ON/OFF MARKINGS AND SHALL HAVE BLACK OR RED OPERATING HANDLE. HANDLE SHALL BE CAPABLE OF BEING PAD-LOCKABLE IN THE 'OFF' POSITION. ENCLOSURE DOOR SHALL HAVE DEFEATABLE INTERLOCKS TO PREVENT OPENING OF THE SWITCH COVER WHEN THE SWITCH IS 'ON' AND TO PREVENT TURNING THE SWITCH 'ON' WHEN THE COVER IS OPEN.

E. SAFETY SWITCHES SHALL BE MANUFACTURED BY SQUARE D, CUTLER HAMMER OR SIEMENS.

17. TRANSFORMERS

P. DRY TYPE TRANSFORMERS SHALL BE PROVIDED WITH KVA RATINGS, PRIMARY VOLTAGE AND SECONDARY VOLTAGE AS INDICATED ON THE DRAWINGS.

Q. DRY TYPE TRANSFORMERS SHALL COMPLY WITH NEMA STANDARD TP-1 & DOE 2016.

R. DRY TYPE TRANSFORMER ENCLOSURE SHALL BE RATED FOR INDOOR USE AND OF THE VENTILATED TYPE.

S. DRY TYPE TRANSFORMERS SHALL HAVE AN INSULATION CLASS OF 220 DEGREES CELSIUS CLASS WITH 150 DEGREE CELSIUS TEMPERATURE RISE.

T. PROVIDE SIX FULL CAPACITY 2.5 PERCENT TAPS, TWO ABOVE AND FOUR BELOW NOMINAL VOLTAGE.

U. TRANSFORMERS SHALL BE MANUFACTURED BY SQUARE D (BASIS OF DESIGN) OR SIMILAR BY CUTLER HAMMER, GENERAL ELECTRIC, OR SIEMENS.

18. PANELBOARDS

A. PANELBOARDS SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER. THE SYSTEM SHALL BE MANUFACTURED BY SQUARE D (BASIS OF DESIGN) OR COMPARABLE EQUIPMENT BY CUTLER HAMMER OR SIEMENS WILL BE ACCEPTABLE. PANELBOARDS SHALL COMPLY WITH NEMA PB1 AND UL 67.

B. PANELBOARDS SHALL HAVE FULLY RATED COPPER MAIN BUS BAR, FIFTY PERCENT COPPER GROUND BUS BAR AND FULLY RATED INSULATED NEUTRAL BUS BAR. PANELBOARDS SHALL HAVE RATED CUAL LUGS FOR THE WIRE SIZE AS SHOWN ON THE ONE-LINE DIAGRAM.

C. CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE.

D. CIRCUIT BREAKER SHALL BE OF THE THERMAL MAGNETIC TYPE WITH ACCESSORIES (SHUNT TRIP, GROUND FAULT PROTECTION, ETC.) AS INDICATED ON THE PANELBOARD SCHEDULE. IN INSTANCES WHERE "PROVISION" IS INDICATED ON THE SCHEDULE, PROVIDE FULLY EQUIPPED SPACE INCLUDING BUS FOR FUTURE INSTALLATION OF CIRCUIT BREAKERS.

E. TANDEM AND HALF SPACE CIRCUIT BREAKERS SHALL NOT BE USED.

F. PANEL SHALL HAVE HINGED LOCKABLE COVER.

G. SERIES RATED PANELBOARD ASSEMBLIES WILL NOT BE APPROVED.

H. PANELBOARDS SHALL BE MARKED TO INDICATE WHERE THE POWER ORIGINATES. THIS LABEL SHALL BE PERMANENTLY AFFIXED, OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED AND NOT HANDWRITTEN. REFER TO IDENTIFICATION SECTION OF THIS SPECIFICATION.

I. MAIN PANEL OR SWITCHBOARD SHALL BE MARKED WITH THE MAXIMUM AVAILABLE FAULT CURRENT TO INCLUDE THE DATE THE FAULT CURRENT CALCULATION WAS PERFORMED.

J. THE CONTRACTOR SHALL BALANCE THE LOADING ON ALL PANELBOARDS AS CLOSELY AS POSSIBLE.

19. LIGHTING

A. ALL LED FIXTURES SHALL BE A PRODUCT OF A SINGLE MANUFACTURER FOR EACH LUMINAIRE TYPE. EACH LED LUMINAIRE TYPE SHALL BE BINNED WITHIN A THREE-STEP MACADAM ELLIPSE TO ENSURE COLOR CONSISTENCY AMONG LUMINAIRES. ALL LED FIXTURES SHALL HAVE INTERNAL DRIVERS. INTERIOR FIXTURE DRIVERS SHALL BE RATED AT 120/277 VOLT. EXTERIOR FIXTURE DRIVERS SHALL BE RATED FOR 120/277 VOLTS. LIGHT FIXTURES SHALL COMPLY WITH NEC ARTICLE 410.130.

B. ALL LIGHT FIXTURES SHOWN SHALL BE SUPPORTED WITH FORMED CHANNELS, ANGLES, RODS, CLAMPS, WASHERS, ETC., OF SUFFICIENT SIZE AND STRENGTH TO SUPPORT THE WEIGHT OF THE FIXTURE FROM THE BUILDING STRUCTURE. ALL ADDITIONAL MOUNTING HARDWARE REQUIRED FOR A COMPLETE INSTALLATION IS TO BE SUPPLIED UNDER THIS CONTRACT.

C. LIGHT FIXTURE SCHEDULE IS AS INDICATED ON FLOOR PLANS OR EQUAL BY EATON, ACUITY, HUBBELL, AND PHILIPS.

D. ALL EMERGENCY LIGHTING UNITS AND EXIT FIXTURES SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS. CONNECT TO LOCAL LIGHTING CIRCUIT AHEAD OF ANY SWITCHES.

E. LIGHT FIXTURES SHALL BE FOR CEILING TYPE AS REQUIRED.

20. SYSTEMS

A. FURNISH AND INSTALL ½" FIRE RATED BACKBOARDS FOR DATA WALL MOUNTED EQUIPMENT AS SHOWN ON

B. THE CONTRACTOR SHALL PROVIDE SINGLE GANG OUTLET BOXES AND ¾" CONDUIT TO ABOVE LIFT OUT CEILING WITH STRING LINE. INSTALL A PLASTIC BUSHING ON CONDUIT WHERE IT TERMINATES ABOVE THE CEILING.



NEW FIELDHOUSE FOR THE
MIDD--WEST SCHOOL DISTRICT
MIDDLEBURG, PA

REVISIONS

NO.	DATE	DESCRIPTION
1	4-9-24	ISSUED FOR BIDDING

SYMBOLS AND
SCHEDULES

DRAWING NO.

E-0

PROJECT NO. 1757-24-001
SCALE: AS NOTED
DATE: 04/09/24

APPROVED BY:

CHECKED BY:

DRAWN BY: