

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

A. GENERAL

1. REQUIREMENTS SPECIFIED IN DIVISION 1, INSTRUCTIONS TO BIDDERS, SUPPLEMENTAL GENERAL CONDITIONS, SPECIAL CONDITIONS, ADDENDA, ALTERNATES, CONTRACT AND PROPOSAL, ALONG WITH DIVISION 26 AND ALL ITS SECTIONS, COMPROMISE THE CONTRACT DOCUMENTS FOR THE ELECTRICAL CONTRACT, ALONG WITH THESE SPECIFICATIONS AS THOUGH THEY WERE ONE, AND ANYTHING IMPLIED BY THE SPECIFICATIONS SHALL BE INTERPRETED AS ALSO IMPLIED BY THE DRAWINGS AND VICE VERSA. PROVIDE NECESSARY ITEMS FOR A COMPLETE INSTALLATION.

2. THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND EQUIPMENT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED INTO, AND BECOME A PART OF THIS DIVISION. EXAMINE SUCH DRAWINGS AND SPECIFICATIONS AND BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS CONTAINED THEREIN. THE SUBMISSION OF THEIR BID SHALL INDICATE SUCH KNOWLEDGE.

3. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC. THEY ARE INTENDED TO SHOW THE APPROXIMATE LOCATIONS OF EQUIPMENT AND CONDUIT, DIMENSIONS GIVEN ON THE PLANS. IN FIGURES, SHALL TAKE PRECEDENCE OVER SCALDED DIMENSIONS AND SHALL BE VERIFIED IN THE FIELD. THE ELECTRICAL CONTRACTOR SHALL LAYOUT EQUIPMENT ROOMS TO MAKE SURE THE EQUIPMENT, AS PURCHASED, FITS IN THE ROOM OR SPACE SHOWN. EXACT LOCATION OF EQUIPMENT SHALL BE VERIFIED IN THE FIELD AND ROUTING OF CONDUITS SHALL SUIT FIELD CONDITIONS.

4. UNTIL THE TIME OF INSTALLATION, THE ARCHITECT RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF CONDUIT AND EQUIPMENT WITHOUT ADDITIONAL COST TO THE CONTRACT.

5. THE ELECTRICAL DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER. MATERIAL AND LABOR NECESSARY TO THE PROJECT SHALL BE FURNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. LABOR AND/OR MATERIALS NEITHER SHOWN NOR SPECIFIED, BUT OBVIOUSLY NECESSARY FOR THE COMPLETION AND PROPER FUNCTIONING OF THE SYSTEM, SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

6. ARRANGE EQUIPMENT SUBSTANTIALLY AS SHOWN ON THE DRAWINGS. MAKE DEVIATIONS ONLY WHERE NECESSARY TO AVOID INTERFERENCE. CHECK EQUIPMENT SIZES AGAINST AVAILABLE SPACE PRIOR TO SHIPMENT TO AVOID INTERFERENCE.

7. EXAMINE THE WORK OF OTHER TRADES AS THEIR WORK COMES IN CONTACT WITH OR IS COVERED BY THIS WORK. IN NO CASE SHALL IT ATTACH TO, OR FINISH AGAINST ANY DEFECTIVE WORK, OR INSTALL WORK IN A MANNER THAT WILL PREVENT PROPER INSTALLATION OF THE WORK OF OTHER TRADES.

8. VERIFY WITH OTHER TRADES ELECTRICAL CHARACTERISTICS OF EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS. CONTRACTOR SHALL VERIFY VOLTAGE, PHASE AND HORSEPOWER AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO START OF WORK. ELECTRICAL CONTRACTOR SHALL PROVIDE DISCONNECTING MEANS AND OVERLOAD PROTECTION FOR EQUIPMENT, UNLESS FURNISHED INTEGRAL WITH EQUIPMENT PACKAGE.

9. WORK SHALL BE INSTALLED IN A PRACTICAL AND WORKMANLIKE MANNER, BY WORKERS SKILLED IN THE SEVERAL TRADES NECESSARY.

10. DURING EACH PHASE AND AT THE COMPLETION OF THE CONSTRUCTION, THIS CONTRACTOR SHALL REMOVE DEBRIS AND EXCESS MATERIALS CAUSED BY THEIR WORK. THEY SHALL LEAVE THE AREA OF OPERATION BROOM CLEAN.

11. ELECTRICAL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OR ETL LABEL.

12. GUARANTEE THEIR WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE YEAR FROM THE DATE OF BUILDING OPENING. SHOULD DEFECTS DEVELOP WITHIN THE GUARANTEE PERIOD, REMEDY THE DEFECTS AND HAVE DAMAGES TO OTHER WORK OR FURNISHINGS CAUSED BY THE REPAIRS CORRECTED AT THEIR EXPENSE TO THE CONDITION BEFORE SUCH DAMAGE.

B. VISIT TO THE SITE

1. VISIT THE SITE OF THE WORK AND BE FAMILIAR WITH CONDITIONS AFFECTING WORK. THE SUBMISSION OF THE PROPOSAL SHALL INDICATE SUCH KNOWLEDGE. NO ADDITIONAL PAYMENT SHALL BE MADE ON CLAIMS THAT ARISE FROM A LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.

C. CODE AND PERMITS

1. INSTALLATION SHALL BE IN FULL ACCORDANCE WITH CODES, RULES AND REGULATIONS OF MUNICIPAL, CITY, COUNTY, STATE AND PUBLIC UTILITIES AND OTHER AUTHORITIES HAVING JURISDICTION OVER THE PREMISES. PERFORMANCE WORK TO COMPLY WITH STANDARD PRACTICES FOR GOOD WORKMANSHIP PUBLISHED BY NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA).

2. ELECTRICAL WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF A LICENSED MASTER ELECTRICIAN.

3. SECURE AND PAY FOR PERMITS, PLAN REVIEWS AND CERTIFICATES OF INSPECTION IN CONNECTION WITH WORK, REQUIRED BY THE FOREGOING AUTHORITIES. BEFORE FINAL PAYMENT OF THE CONTRACT IS ALLOWED, CERTIFICATES SHALL BE DELIVERED TO THE ARCHITECT IN DUPLICATE.

4. ELECTRICAL MATERIAL AND EQUIPMENT SHALL BEAR THE UL LABEL EXCEPT WHERE UL DOES NOT LABEL SUCH TYPES OF MATERIAL AND EQUIPMENT.

D. SHOP DRAWINGS SUBMITTALS

1. SUBMIT ELECTRONIC COPIES OF SHOP DRAWINGS OF THE FOLLOWING EQUIPMENT USING THE INDICATED NUMBERING SYSTEM AND TITLES, SHALL BE SUBMITTED THROUGH THE ARCHITECT TO THE ENGINEER AND THEN RESUBMITTED FOR FINAL APPROVAL IF NECESSARY. SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS:

- PANELBOARDS
- CONTACTORS, TIME SWITCHES AND PHOTOCELL
- LIGHTING FIXTURES/CONTROLS

2. SHOP DRAWINGS (MANUFACTURERS EQUIPMENT DESCRIPTIVE SHEETS OR VENDORS PREPARED DRAWINGS) SHALL HAVE THE GENERAL CONTRACTOR'S OR SUBCONTRACTOR'S "STAMP OF APPROVAL" INDICATING THAT THE ITEM SUBMITTED IS AS CALLED FOR ON THE PLANS AND SPECIFICATIONS, IS APPROVED BY THE GENERAL CONTRACTOR OR SUBCONTRACTOR, THE DATE OF APPROVAL AND INITIALED BY THE PERSON APPROVING THE SUBMITTAL AND THE NAME OF THE COMPANY SUBMITTING SAID EQUIPMENT FOR APPROVAL.

3. SUBMIT ELECTRONIC COPY COMPLETE WITH A TABLE OF CONTENTS. ANY SUBMITTALS NOT IN ELECTRONIC COPY FROM OR NOT AS SPECIFIED SHALL BE RETURNED AT THE CONTRACTOR'S EXPENSE FOR RESUBMITTAL.

4. DESCRIPTIVE LITERATURE SHALL BE SUBMITTED WITH A COVER IDENTIFYING THE FOLLOWING:

- a. NAME OF THE JOB
- b. LOCATION OF THE JOB, ADDRESS, CITY AND STATE.
- c. NAME AND ADDRESS OF THE COMPANY SUBMITTING THE BROCHURES.
- d. DATE OF SUBMITTAL

5. CHECK THE SHOP DRAWINGS TO DETECT AND CORRECT ERRORS, OMISSIONS AND INACCURACIES. FAILURE TO DO THIS WILL NOT RELIEVE THE ELECTRICAL CONTRACTOR OF THE RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

E. AS-BUILT DRAWINGS

1. SUBMIT TO THE ARCHITECT ONE SET OF REPRODUCIBLE ELECTRICAL DRAWINGS SHOWING THE AS-BUILT CONDITIONS.

F. STANDARDS AND SUBSTITUTIONS

1. WHEREVER THE WORDS "APPROVED BY", "APPROVED EQUAL", "AS DIRECTED" OR SIMILAR PHRASES ARE USED IN THE FOLLOWING SPECIFICATIONS, THEY SHALL BE UNDERSTOOD TO REFER TO THE OWNER AS THE APPROVING AGENCY. THE NAME OR MAKE OF EQUIPMENT OR MATERIALS NAMED IN THIS SPECIFICATIONS (WHETHER OR NOT THE WORDS "APPROVED EQUAL" ARE USED) SHALL BE KNOWN AS THE "STANDARD".

2. THESE SPECIFICATIONS ESTABLISH QUALITY STANDARD OF MATERIALS AND EQUIPMENT TO BE PROVIDED. SPECIFIC ITEMS ARE IDENTIFIED BY MANUFACTURER, TRADE NAME OR CATALOG DESIGNATION. THIS CONTRACTOR SHALL SUBMIT A BASE BID PRICE BASED UPON STANDARD SPECIFIED EQUIPMENT DESCRIBED HEREIN AND AS DETAILED ON DRAWINGS AND ASSOCIATED CONTRACT DOCUMENTS. THESE SPECIFICATIONS ARE NOT TO BE CONSIDERED PROPRIETARY. THE CONTRACTOR MAY SUBMIT INFORMATION ON MATERIALS AND MANUFACTURERS (OTHER THAN THOSE LISTED) FOR REVIEW BY THE ARCHITECT AND ENGINEER NO LATER THAN TEN (10) DAYS BEFORE BIDS ARE SUBMITTED. MANUFACTURERS OF PRODUCTS ACCEPTED BY THE ARCHITECT AND ENGINEER WILL BE LISTED IN AN ADDENDUM TO THE SPECIFICATIONS AS AN ACCEPTABLE SUBSTITUTION EQUIPMENT ACCEPTED AS DETAILED BELOW AND SHALL BE SHOWN AS A SEPARATE ADD-ON/DEDUCT PRICE TO BE FACTORED INTO THE BASE BID PRICE BY THE ARCHITECT AND OWNER IF ACCEPTED.

3. SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS AND EQUIPMENT OTHER THAN THOSE SPECIFIED OR APPROVED BY ADDENDUM, SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS TO THE ARCHITECT AT THE BID OPENING. THE REQUEST SHALL BE AN ALTERNATE THE ORIGINAL BID, BE ACCOMPANIED WITH COMPLETE DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ITEMS. FAILURE BY THIS CONTRACTOR TO SUBMIT THE REQUISITE DOCUMENTATION DETAILED ABOVE SHALL BE UNDERSTOOD BY THE ARCHITECT AND ENGINEER TO INDICATE THAT SUBSTITUTE EQUIPMENT WILL NOT BE PRESENTED BY THE CONTRACTOR FOR CONSIDERATION. SUCH SUBSTITUTION WILL NOT BE CONSIDERED AFTER THE BID OPENING DATE AND DELAY OF PROJECT WILL NOT BE PERMITTED FOR FURTHER INSPECTION AND EVALUATION AFTER THIS DATE.

4. WHERE SUCH SUBSTITUTIONS ALTER THE DESIGN OR SPACE REQUIREMENTS INDICATED ON THE DRAWINGS, INCLUDE ITEMS OF COST FOR THE REVISED DESIGN AND CONSTRUCTION INCLUDING COST OF ALLIED TRADES INVOLVED.

5. ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO APPROVAL OF THE ARCHITECT AND ENGINEER, IF REQUESTED. THE CONTRACTOR SHALL SUBMIT (AT OWN COST) INSPECTION SAMPLES OF BOTH THE SPECIFIED AND PROPOSED SUBSTITUTE ITEMS.

6. IN CASE WHERE SUBSTITUTIONS ARE PERMITTED, THE CONTRACTOR SHALL BEAR ANY COST OF EVALUATING THE QUALITY OF THE MATERIAL AND EQUIPMENT TO BE PROVIDED.

G. TESTING AND PLACING IN SERVICE

1. ANY MATERIAL OR EQUIPMENT FAILING A TEST SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

2. TESTS SHALL INCLUDE THE FOLLOWING:

- a. MEASURE THE LOAD ON EACH PHASE OF THE MAIN SERVICE AND EACH PHASE OF EVERY FEEDER UNDER FULL LOAD CONDITIONS.
- MEASURE THE NO-LOAD AND FULL-LOAD VOLTAGES (PHASE TO PHASE, PHASE TO NEUTRAL AND PHASE TO GROUND) FOR EACH PHASE OF EACH SERVICE, OR EACH SEPARATELY DERIVED SYSTEM, AND AT EACH PANELBOARD OR TRANSFORMER.
- MEASURE THE GROUND RESISTANCE OF THE MAIN SERVICE GROUNDING ELECTRODE AND THE GROUND RESISTANCE OF EACH SEPARATELY DERIVED SYSTEM'S GROUNDING ELECTRODE.
- MAKE INSULATION RESISTANCE TESTS ON DRY TYPE TRANSFORMERS AND MOTORS.

H. INTERFERENCES

1. BEFORE THE INSTALLATION OF ANY ITEM BEGINS, CAREFULLY ASCERTAIN THAT IT DOES NOT INTERFERE WITH CLEARANCES FOR THE ERECTION OF FINISH BEAMS, COLUMNS, PILASTERS, WALLS OR OTHER STRUCTURAL OR ARCHITECTURAL MEMBERS AS SHOWN ON THE ARCHITECTURAL DRAWINGS. IF ANY WORK IS INSTALLED AND THE ARCHITECTURAL DESIGN CANNOT BE FOLLOWED, MAKE CHANGES IN WORK AS DIRECTED BY THE ARCHITECT TO PERMIT THE COMPLETION OF THE ARCHITECTURAL WORK IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.

2. REPORT ANY INTERFERENCES BETWEEN THEIR WORK AND THAT OF ANY OF THE OTHER CONTRACTORS AS SOON AS THEY ARE DISCOVERED. THE ARCHITECT SHALL DETERMINE WHICH EQUIPMENT WILL BE RELOCATED, REGARDLESS OF WHICH WAS INSTALLED FIRST. THIS DECISION WILL BE FINAL.

I. QUALITY ASSURANCE

1. ALL PRODUCTS SHALL BE NEW AND OF THE TYPE AND QUALITY SPECIFIED. WHERE MATERIALS, EQUIPMENT, APPARATUS OR OTHER PRODUCTS ARE SPECIFIED BY MANUFACTURER, BRAND NAME, TYPE OF CATALOG NUMBER, SUCH DESIGNATION SHALL ESTABLISH THE STANDARDS OF THE DESIRED QUALITY AND STYLE. IT IS THE INTENT OF THESE SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY OF MATERIALS AND EQUIPMENT INSTALLED.

SECTION 260510 - WIRE AND CABLE

A. COLOR CODE CONDUCTORS (EXCEPT CONTROL AND INSTRUMENTATION CONDUCTORS) TO MATCH EXISTING BUILDING COLOR CODING:

- 1. #12 AND #10 CONDUCTORS SHALL HAVE CONTINUOUS INSULATION COLOR.
- 2. COLOR CODE CONDUCTORS LARGER THAN ABOVE, WHICH DO NOT HAVE CONTINUOUS INSULATION COLOR BY APPLICATION OF AT LEAST TWO LAPS OF COLORED TAPE ON EACH CONDUCTOR AT POINTS OF ACCESS INCLUDING JUNCTION BOXES. COLOR TAPE SHALL BE THE EQUAL OF 3M PRODUCTS SCOTCH #35.

3. CONDUCTORS SHALL BE SOFT ANNEALED COPPER INSULATED FOR 600 VOLTS UNLESS SPECIFICALLY INDICATED OTHERWISE.

B. INSULATION TYPE SHALL BE TYPE THHN OR THWN FOR WIRE SIZES #8 AWG AND LARGER AND THHN OR THWN FOR #10 AWG AND SMALLER. THHN SHALL NOT BE USED IN WET OR DAMP LOCATIONS.

C. FLEXIBLE CORD SHALL BE HEAVY DUTY TYPE SO WITH AN EQUIPMENT GROUND CONDUCTOR IN ADDITION TO THE CURRENT CARRYING CONDUCTORS.

D. PROVIDE MINIMUM #12 CONDUCTORS, UNLESS OTHERWISE INDICATED.

E. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED, CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID.

F. INSTALL WIRING IN CONDUIT WHERE EXPOSED OR IN AREAS OR IN AREAS THAT ARE EXPOSED TO PHYSICAL DAMAGE.

G. CONNECT #10 AND SMALLER WIRES WITH CONSTANT PRESSURE EXPANDABLE SPRING TYPE CONNECTORS, "SCOTCHLOCK" BY 3M OR B-CAP BY BUCHANAN.

H. CONNECT #8 AND LARGER WIRES WITH COMPRESSION CONNECTORS OR SPLICES AS MANUFACTURED BY BURNDY OR T&B.

I. INSULATE SPlicing CONNECTORS TO AT LEAST 200% OF THE WIRE INSULATION. USE PRE-STRETCHED TUBING CONNECTOR INSULATORS, 3M PST FOR #2 AND LARGER CONDUCTORS.

J. PULL CONDUCTORS USING RECOGNIZED METHODS AND EQUIPMENT LEAVING AT LEAST 6" WIRE AT JUNCTION BOXES FOR CONNECTIONS.

K. CLEAN OUT CONDUIT SYSTEM BEFORE PULLING WIRE.

L. WIRENUT JOINTS OR SPLICES MADE INSIDE SWITCHBOARDS/PANELBOARDS IS NOT ALLOWED.

M. BRANCH CIRCUIT WIRE SIZES (AND CONDUITS) SHALL BE INCREASED FROM THOSE INDICATED ON THE PLANS TO PREVENT EXCESSIVE VOLTAGE DROP. BRANCH CIRCUITS SHALL BE INSTALLED WITH WIRES OF SUFFICIENT SIZE SO THAT VOLTAGE DROP BETWEEN THE PANEL AND THE LOADS DOES NOT EXCEED LIMIT OF 3%.

O. CIRCUITS MAY BE MULTI-PLEXED IN CONDUIT PROVIDED WIRE IS PROPERLY DERATED AND CONDUIT SIZED PER CODE. UNDER NO CIRCUMSTANCES SHALL MORE THAN SIX (6) CURRENT CARRYING CONDUCTORS BE RUN IN A SINGLE CONDUIT.

SECTION 260526 - GROUNDING AND BONDING

A. GROUND EQUIPMENT PER NEC.

B. CONDUITS SHALL CONTAIN A GROUND WIRE SIZE PER NEC. IN ADDITION TO THE CONDUCTORS SHOWN ON THE PLANS, WHERE CIRCUIT CONDUCTORS ARE INCREASED IN SIZE FOR VOLTAGE DROP, THE GROUND WIRE SIZE SHALL BE INCREASED PROPORTIONATELY.

C. ENSURE THAT PARTS OF ELECTRICAL INSTALLATIONS WHICH EITHER ENCLOSE OR GUARD LIVE PARTS SHALL BE SOLIDLY GROUNDED.

D. GROUNDING CONDUCTORS SHALL BE COPPER. CONDUCTORS SMALLER THAN NO. 8 AWG SHALL BE SOLID; ALL OTHER CONDUCTORS SHALL BE STRANDED. GROUND CONDUCTORS SHALL BE BARE OR HAVE TYPE THHN INSULATION, GREEN IN COLOR.

F. GROUND RODS SHALL BE COPPER CLAD SOLID STEEL, 10-FEET LONG, 3/8-IN. DIAMETER. IF DEPTHS OF MORE THAN 10-FEET ARE REQUIRED TO ACHIEVE DESIRED GROUND RESISTANCE VALUE OF 5 OHMS, SECTIONAL RODS WHICH ARE THREADED ON BOTH ENDS SHALL BE USED. ALL COUPLINGS SHALL BE BRONZE AND MADE BY THE ROD MANUFACTURER.

260529 - HANGERS AND SUPPORTS FOR ELECTRICAL EQUIPMENT

A. SCOPE OF WORK:

1. PROVIDE LABOR, MATERIAL, STORAGE, UNPACKING AND PLACEMENT FOR COMPLETE SYSTEMS; TO INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING ITEMS:

- a) EMERGENCY LIGHTING AND POWER.
- b) POWER AND LIGHTING DISTRIBUTION SYSTEM INCLUDING PANELS, TRANSFORMERS AND FEEDERS.
- c) BRANCH CIRCUIT WIRING SYSTEM.
- d) POWER WIRING FOR AIR CONDITIONING EQUIPMENT, PLUMBING SYSTEM, HEATING EQUIPMENT, VENTILATING AND EXHAUST EQUIPMENT.
- e) LIGHTING FIXTURE INSTALLATION.

f) TELEPHONE AND COMMUNICATION CONDUIT INCLUDING BOXES, ETC., AS SPECIFIED, SHOWN ON THE DRAWINGS AND REQUIRED BY THE LOCAL TELEPHONE COMPANY AND/OR OWNER.

g) TESTING OF CABLES AND CIRCUIT WIRING AFTER INSTALLATION.

2. PADS: ARRANGE IN SINGLE OR MULTIPLE LAYERS OF SUFFICIENT STIFFNESS FOR UNIFORM LOADING OVER PAD AREA, MOLDED WITH A NONSLIP PATTERN AND GALVANIZED-STEEL BASEPLATES, AND FACTORY CUT TO SIZES THAT MATCH REQUIREMENTS OF SUPPORTED EQUIPMENT.
 a) RESILIENT MATERIAL: OIL- AND WATER-RESISTANT RUBBER.
 3. Spring isolators: Freestanding, laterally stable, open-spring isolators.
 a) OUTSIDE SPRING DIAMETER: NOT LESS THAN 80 PERCENT OF THE COMPRESSED HEIGHT OF THE SPRING AT RATED LOAD.
 b) MINIMUM ADDITIONAL TRAVEL: 50 PERCENT OF THE REQUIRED DEFLECTION AT RATED LOAD.
 c) LATERAL STIFFNESS: MORE THAN 80 PERCENT OF RATED VERTICAL STIFFNESS.
 d) OVERLOAD CAPACITY: SUPPORT 200 PERCENT OF RATED LOAD, FULLY COMPRESSED, WITHOUT DEFORMATION OR FAILURE.
 e) BASEPLATES: FACTORY DRILLED FOR BOLTING TO STRUCTURE AND BONDED TO 1/4-INCH (6-mm)-THICK, RUBBER ISOLATOR PAD ATTACHED TO BASEPLATE UNDERSIDE. BASEPLATES SHALL LIMIT FLOOR LOAD TO 500 PSF (3447 kPa).
 f) TOP PLATE AND ADJUSTMENT BOLT: THREADED TOP PLATE WITH ADJUSTMENT BOLT AND CAP SCREW TO FASTEN AND LEVEL EQUIPMENT.
 4. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING ISOLATORS WITH SEISMIC OR LIMIT-STOP RESTRAINT.
 a) HOUSING: STEEL WITH RESILIENT VERTICAL-LIMIT STOPS TO PREVENT SPRING EXTENSION DUE TO WEIGHT BEING REMOVED. FACTORY-DRILLED BASEPLATE BONDED TO 1/4-INCH (6-mm)-THICK, NEOPRENE OR RUBBER ISOLATOR PAD ATTACHED TO THE BASEPLATE UNDERSIDE, AND ADJUSTABLE EQUIPMENT MOUNTING AND LEVELING BOLT THAT ACTS AS BLOCKING DURING INSTALLATION.
 b) RESTRAINT: SEISMIC OR LIMIT-STOP AS REQUIRED FOR EQUIPMENT AND AUTHORITIES HAVING JURISDICTION.
 c) OUTSIDE SPRING DIAMETER: NOT LESS THAN 80 PERCENT OF THE COMPRESSED HEIGHT OF THE SPRING AT RATED LOAD.
 d) MINIMUM ADDITIONAL TRAVEL: 50 PERCENT OF THE REQUIRED DEFLECTION AT RATED LOAD.
 e) LATERAL STIFFNESS: MORE THAN 80 PERCENT OF RATED VERTICAL STIFFNESS.
 f) OVERLOAD CAPACITY: SUPPORT 200 PERCENT OF RATED LOAD, FULLY COMPRESSED, WITHOUT DEFORMATION OR FAILURE.

SECTION 260553 - EQUIPMENT IDENTIFICATION

A. NAMEPLATES

1. GENERAL: FURNISH AND MOUNT ON EACH PANELBOARD, SWITCHBOARD (INCLUDING BRANCH SWITCHES), TRANSFORMERS, LARGE JUNCTION BOX, SAFETY SWITCH, STARTER, REMOTE CONTROL, PUSH BUTTON STATION, AND SIMILAR CONTROLS, A NAMEPLATE DESCRIPTIVE OF THE EQUIPMENT OR EQUIPMENT CONTROLLED.
 2. PROVIDE BLACK AND WHITE NAMEPLATES CONSTRUCTED FROM LAMINATED PHENOLIC WITH A WHITE CENTER CORE. LETTERS SHALL BE ENGRAVED IN THE PHENOLIC TO FORM WHITE LETTERS 3/8" HIGH. FASTEN THE NAMEPLATES WITH AN ADHESIVE TYPE FASTENER.

SECTION 260925 - DIGITAL LIGHTING CONTROLS

A. SYSTEM OVERVIEW: DESIGN IS BASED ON AN ACUTY N-LIGHT SYSTEM.

1. PROVIDE A COMPLETELY DIGITAL LIGHTING CONTROL SYSTEM AS SPECIFIED ON PLAN OR PRE-APPROVED EQUIVALENT.
 a) BY USING PRE-APPROVED SUBSTITUTIONS, THE CONTRACTOR ACCEPTS RESPONSIBILITY AND ASSOCIATED COSTS FOR ALL REQUIRED MODIFICATIONS TO CIRCUITRY, DEVICES, AND WIRING. THE CONTRACTOR SHALL PROVIDE COMPLETE ENGINEERED SHOP DRAWINGS (INCLUDING POWER AND CONTROL WIRING) WITH DEVIATION FROM THE ORIGINAL DESIGN HIGHLIGHTED IN AN ALTERNATE COLOR TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ROUGH-IN. IN ADDITION AND PRIOR TO FINAL ACCEPTANCE OF PRE-APPROVED SUBSTITUTIONS, CONTRACTOR IN CONJUNCTION WITH ALTERNATE MANUFACTURER WILL ARRANGE PRODUCT DEMONSTRATION FOR OWNER AND DESIGN TEAM. IN THE EVENT ALTERNATE IS NOT APPROVED, PROVIDE SYSTEM AS SPECIFIED AT NO ADDITIONAL COST TO THE OWNER.
 b) WALL AND CEILING MOUNTED DEVICE AND COVERPLATE COLORS WHITE UNLESS OTHERWISE NOTED.

B. COMMISSIONING OF A SYSTEM OR SYSTEMS SPECIFIED IN THIS SECTION IS PART OF THE CONSTRUCTION PROCESS. DOCUMENTATION AND TESTING OF THESE SYSTEMS, AS WELL AS TRAINING OF THE OWNER'S OPERATION AND MAINTENANCE PERSONNEL, IS REQUIRED IN COOPERATION WITH THE OWNER'S REPRESENTATIVE. PROJECT CLOSEOUT IS DEPENDENT ON SUCCESSFUL COMPLETION OF ALL COMMISSIONING PROCEDURES, DOCUMENTATION, AND ISSUE CLOSURE.

C. THE LIGHTING CONTROL AND AUTOMATION SYSTEM AS DEFINED UNDER THIS SECTION COVERS THE FOLLOWING EQUIPMENT:

- DIGITAL ROOM CONTROLLERS: SELF-CONFIGURING, DIGITALLY ADDRESSABLE ONE, TWO, OR THREE RELAYS CONTROLLERS WITH 0-10 VOLT CONTROL FOR BALLASTS (IF APPLICABLE) AND SINGLE RELAY APPLICATION-SPECIFIC PLUG LOAD CONTROLLERS.

2. DIGITAL OCCUPANCY SENSORS: SELF-CONFIGURING, DIGITALLY ADDRESSABLE, AND CALIBRATED OCCUPANCY SENSORS WITH LCD DISPLAY AND TWO-WAY ACTIVE INFRARED (IR) COMMUNICATIONS.

3. DIGITAL SWITCHES: SELF-CONFIGURING, DIGITALLY ADDRESSABLE PUSHBUTTON SWITCHES, DIMMERS, AND SCENE SWITCHES WITH TWO-WAY ACTIVE IR COMMUNICATIONS.

4. DIGITAL PHOTOSENSORS: SINGLE-ZONE CLOSED LOOP AND MULTI-ZONE OPEN LOOP DAYLIGHTING SENSORS WITH TWO-WAY ACTIVE IR COMMUNICATIONS CAN PROVIDE SWITCHING OR DIMMING CONTROL FOR DAYLIGHT HARVESTING.

5. CONFIGURATION TOOLS: HANDHELD REMOTE FOR ROOM CONFIGURATION PROVIDES TWO-WAY IR COMMUNICATIONS TO DIGITAL DEVICES AND ALLOWS COMPLETE CONFIGURATION AND RECONFIGURATION OF THE DEVICE/ROOM FROM UP TO 30 FEET AWAY. UNIT TO HAVE ORGANIC LED DISPLAY, SIMPLE PUSHBUTTON INTERFACE, AND ALLOW SEND AND RECEIVE OF ROOM VARIABLES AND STORE OF OCCUPANCY SENSOR SETTINGS. COMPUTER SOFTWARE ALSO CUSTOMIZES ROOM SETTINGS.

6. HANDHELD REMOTES FOR PERSONAL CONTROL: ONE-BUTTON DIMMING, TWO-BUTTON ON/OFF, OR FIVE-BUTTON SCENE REMOTES PROVIDE CONTROL USING IR COMMUNICATIONS. REMOTE MAY BE CONFIGURED IN THE FIELD TO CONTROL SELECTED LOADS OR SCENES WITHOUT SPECIAL TOOLS.

7. DIGITAL LIGHTING MANAGEMENT (DLM) LOCAL NETWORK: FREE TOPOLOGY, PLUG-IN WIRING SYSTEM (CAT 5E) FOR POWER AND DATA TO ROOM DEVICES.

8. NETWORK BRIDGE PROVIDES BACNET MS/TP-COMPLIANT DIGITAL NETWORKED COMMUNICATION BETWEEN ROOMS, PANELS AND THE SEGMENT MANAGER OR BUILDING AUTOMATION SYSTEM (BAS).

9. SEGMENT MANAGER PROVIDES WEB BROWSER-BASED USER INTERFACE FOR SYSTEM CONTROL, SCHEDULING, POWER MONITORING, ROOM DEVICE PARAMETER ADMINISTRATION AND REPORTING.

10. EMERGENCY LIGHTING CONTROL UNIT (ELCU) ALLOWS A STANDARD LIGHTING CONTROL DEVICE TO CONTROL EMERGENCY LIGHTING IN CONJUNCTION WITH NORMAL LIGHTING IN ANY AREA WITHIN A BUILDING.

D. UNLESS RELEVANT PROVISIONS OF THE APPLICABLE LOCAL ENERGY CODES ARE MORE STRINGENT, PROVIDE A MINIMUM APPLICATION OF LIGHTING CONTROLS AS FOLLOWS:

1. SPACE CONTROL REQUIREMENTS: PROVIDE OCCUPANCY/VACANCY SENSORS WITH MANUAL-ON FUNCTIONALITY IN ALL SPACES EXCEPT TOILET ROOMS, STOREROOMS, LIBRARY STACKS, OR OTHER APPLICATIONS WHERE HANDS-FREE OPERATION IS DESIRABLE AND AUTOMATIC-ON OCCUPANCY SENSORS ARE MORE APPROPRIATE. PROVIDE MANUAL-ON OCCUPANCY/VACANCY SENSORS FOR ANY ENCLOSED OFFICE, CONFERENCE ROOM, MEETING ROOM, OPEN PLAN SYSTEM, AND TRAINING ROOM, FOR SPACES WITH MULTIPLE OCCUPANTS OR WHERE LINE-OF-SIGHT MAY BE OBSCURED, PROVIDE CEILING- OR CORNER-MOUNTED SENSORS AND MANUAL-ON SWITCHES.

2. BI-LEVEL LIGHTING: PROVIDE MULTI-LEVEL CONTROLS IN ALL SPACES EXCEPT TOILET ROOMS, STOREROOMS, LIBRARY STACKS, OR APPLICATIONS WHERE VARIABLE DIMMING IS USED.

3. DAYLIT AREAS: ALL LUMINARIES WITHIN 15 FEET OF WINDOWS OR WITHIN 7 FEET OF SKYLIGHTS (THE DAYLIT ZONE) SHALL BE CONTROLLED SEPARATELY FROM LUMINAIRES OUTSIDE OF DAYLIT ZONES. LUMINAIRES CLOSEST TO THE DAYLIGHT APERTURE SHALL BE CONTROLLED SEPARATELY FROM LUMINAIRES FARTHER FROM THE DAYLIGHT APERTURE, WITHIN THE DAYLIGHT ZONE.

4. DAYTIME SETPOINTS FOR TOTAL AMBIENT ILLUMINATION (COMBINED DAYLIGHT AND ELECTRIC LIGHT) LEVEL THAT INITIATE DIMMING SHALL BE PROGRAMMED TO BE NOT LESS THAN 125% OF THE NIGHTTIME MAINTAINED DESIGNED ILLUMINATION LEVELS.

5. MULTIPLE-LEVELLED SWITCHED DAYLIGHT HARVESTING CONTROLS MAY BE UTILIZED FOR AREAS MARKED ON DRAWINGS.

6. PROVIDE SMOOTH AND CONTINUOUS DAYLIGHT DIMMING FOR AREAS MARKED ON DRAWINGS. DAYLIGHTING CONTROL SYSTEM MAY BE DESIGNED TO TURN OFF ELECTRIC LIGHTING WHEN DAYLIGHT IS AT OR ABOVE REQUIRED LIGHTING LEVELS, ONLY IF SYSTEM FUNCTIONS TO TURN LAMPS BACK ON AT DIMMED LEVEL, RATHER THAN TURNING FULL-ON PRIOR TO DIMMING.

7. INTERFACE WITH RELAY PANELS FOR ASSOCIATED PLUGLOAD CONTROL.

8. PROVIDE OCCUPANCY/VACANCY SENSORS FOR ANY ENCLOSED OFFICE, CONFERENCE ROOM, MEETING ROOM, AND TRAINING ROOM. FOR SPACES WITH MULTIPLE OCCUPANTS OR WHERE LINE-OF-SIGHT MAY BE OBSCURED, PROVIDE CEILING-OR COUNTER-MOUNTED WITH MANUAL-ON SWITCHES.

9. CONFERENCE, MEETING, TRAINING, AUDITORIUMS, AND MULTIPURPOSE ROOMS SHALL HAVE CONTROLS THAT ALLOW FOR INDEPENDENT CONTROL OF EACH LOCAL CONTROL ZONE.

C. DESCRIPTION: FACTORY-ASSEMBLED AND -TESTED, AIR-COOLED UNITS FOR 60-HZ SERVICE.

1. CORES: GRAIN-ORIENTED, NON-AGING SILICON STEEL.

2. COILS: CONTINUOUS WINDINGS WITHOUT SPLICES EXCEPT FOR TAPS.
 a) INTERNAL COIL CONNECTIONS: BRAZED OR PRESSURE TYPE.
 b) COIL MATERIAL: COPPER.

3. FINISHES:

a) INDOOR UNITS: MANUFACTURER'S STANDARD PAINT OVER CORROSION-RESISTANT PRETREATMENT AND PRIMER.
 b) OUTDOOR UNITS: COMPLY WITH ANSI C57.12.28.
 c) FINISH COLOR: ANSI 61 GRAY.
 d) COMPUTER WITH NEMA ST 20, AND LIST AND LABEL AS COMPLYING WITH UL 1561.
 e) PROVIDE TRANSFORMERS THAT ARE CONSTRUCTED TO WITHSTAND SEISMIC FORCES SPECIFIED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS."

f) CORES: ONE LEG PER PHASE.

g) WINDINGS: ONE COIL PER PHASE IN PRIMARY AND SECONDARY.

h) ENCLOSURE: VENTILATED, NEMA 250, TYPE 2.

i) Core and coil shall be encapsulated within resin compound, sealing out moisture and air.

j) Transformer Enclosure Finish: Comply with NEMA 250.

4. MANUFACTURER SEISMIC QUALIFICATION CERTIFICATION: SUBMIT CERTIFICATION THAT TRANSFORMERS, ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED IN DIVISION 26 SECTION "VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS." INCLUDE THE FOLLOWING:

a) BASIS FOR CERTIFICATION: INDICATE WHETHER WITHSTAND CERTIFICATE IS BASED ON ACTUAL TEST OF ASSEMBLED COMPONENTS OR ON CALCULATION.

b) THE TERM "WITHSTAND" MEANS "THE UNIT WILL REMAIN IN PLACE WITHOUT SEPARATION OF ANY PARTS FROM THE DEVICE WHEN SUBJECT TO THE SEISMIC FORCES SPECIFIED."

c) DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OR GRAVITY AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE PROVISIONS.

d) DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS.

5. TAPS FOR TRANSFORMERS 15 KVA TO 300 KVA: TWO 2.5 PERCENT TAPS ABOVE AND FOUR 2.5 PERCENT TAPS BELOW NORMAL FULL CAPACITY.

6. INSULATION CLASS: 220 DEG C, UL-COMPONENT-RECOGNIZED INSULATION SYSTEM WITH A MAXIMUM OF 115 DEG C RISE ABOVE 40 DEG C AMBIENT TEMPERATURE.

7. LOW-SOUND-LEVEL REQUIREMENTS: MINIMUM OF 3 DBA LESS THAN NEMA ST 20 STANDARD SOUND LEVELS WHEN FACTORY TESTED ACCORDING TO IEEE C57.12.91.

SECTION 262413 - SWITCHBOARDS

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

1. EATON CORPORATION: CUTLER-HAMMER PRODUCTS.

2. GENERAL ELECTRIC CO.: ELECTRICAL DISTRIBUTION & PROTECTION DIV.

3. SIEMENS ENERGY & AUTOMATION, INC.

4. SQUARE D.

B. FRONT-CONNECTED, FRONT-ACCESSIBLE SWITCHBOARD: PANEL-MOUNTED MAIN DEVICE, PANEL-MOUNTED BRANCHES, AND SECTIONS REAR-ALIGNED.

C. ENCLOSURE: STEEL, NEMA 250, TYPE 1 FOR INDOOR DISTRIBUTION AND 3R FOR OUTDOOR MAIN AND INCOMING METERING.

1. ENCLOSURE FINISH FOR OUTDOOR UNITS: FACTORY-APPLIED FINISH IN MANUFACTURER'S STANDARD COLOR. UNDERSURFACES TREATED WITH CORROSION-RESISTANT UNDERCOATING.

2. ENCLOSURE FINISH FOR INDOOR UNITS: FACTORY-APPLIED FINISH IN MANUFACTURER'S STANDARD GRAY FINISH OVER A RUST-INHIBITING PRIMER ON TREATED METAL SURFACE.

D. UTILITY METERING COMPARTMENT: FABRICATED COMPARTMENT AND SECTION COMPLYING WITH UTILITY COMPANY'S REQUIREMENTS. IF SEPARATE VERTICAL SECTION IS REQUIRED FOR UTILITY METERING, MATCH AND ALIGN WITH BASIC SWITCHBOARD.

E. BUSSES AND CONNECTIONS: THREE PHASE, FOUR WIRE.

1. PHASE- AND NEUTRAL-BUS MATERIAL: HARD-DRAWN COPPER OF 98 PERCENT CONDUCTIVITY WITH FEEDER CIRCUIT-BREAKER LINE CONNECTIONS.

F. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL.

1. MAIN AND NEUTRAL LUGS: MECHANICAL TYPE.

2. GROUND LUGS AND BUS CONFIGURED TERMINATORS: COMPRESSION TYPE.

3. FEED-THROUGH LUGS: MECHANICAL TYPE SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT OPPOSITE END OF BUS FROM INCOMING LUGS OR MAIN DEVICE.

G. FULLY RATED TO INTERRUPT SYMMETRICAL SHORT-CIRCUIT CURRENT AVAILABLE AT TERMINALS.

H. BRANCH OVERCURRENT PROTECTIVE DEVICES: BOLT-ON CIRCUIT BREAKERS, REPLACEABLE WITHOUT DISTURBING ADJACENT UNITS.

1. DOORS: CONCEALED HINGES; SECURED WITH FLUSH LATCH WITH TUMBLER LOCK, KEYED ALIKE.

I. OVERCURRENT PROTECTIVE DEVICES

1. MOLDED-CASE CIRCUIT BREAKER: UL 489, WITH INTERRUPTING CAPACITY TO MEET AVAILABLE FAULT CURRENTS.

a) THERMAL-MAGNETIC CIRCUIT BREAKERS: INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS, AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS.

b) ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 200 A AND LARGER.

c) ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTING.

d) ELECTRONIC TRIP-UNIT CIRCUIT BREAKERS SHALL HAVE RMS SENSING, FIELD-REPLACEABLE RATING PLUG, AND THE FOLLOWING FIELD-ADJUSTABLE SETTINGS:

1. INSTANTANEOUS TRIP.

2. LONG- AND SHORT-TIME PICKUP LEVELS.

3. LONG- AND SHORT-TIME TIME ADJUSTMENTS.

4. GROUND-FAULT PICKUP LEVEL, TIME DELAY, AND I2T RESPONSE.

D. CURRENT-LIMITING CIRCUIT BREAKERS: FRAME SIZES 400 A AND SMALLER; LET-THROUGH RATINGS LESS THAN NEMA FU 1, RK-5.

e) Molded-Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

a) LUGS: MECHANICAL STYLE, SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIALS.

b) APPLICATION LISTING: APPROPRIATE FOR APPLICATIONS; TYPE SWD FOR SWITCHING FLUORESCENT LIGHTING LOADS; TYPE HACR FOR HEATING, AIR-CONDITIONING, AND REFRIGERATING EQUIPMENT.

C. SWITCHES:

1. PROVIDE TOTALLY ENCLOSED, 20 AMPERE, 120/277 VOLT, QUIET A/C GENERAL USE SNAP SWITCHES.

2. SWITCHES SHALL BE SPEC

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SECTION 265100 - INTERIOR LIGHTING

- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED ON PLAN OR PRE-APPROVED EQUIVALENT. LUMINAIRES SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL AND SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
- B. EXIT SIGNS SHALL COMPLY WITH UL 924, FOR SIGN COLORS, VISIBILITY, LUMINANCE, AND LETTERING SIZE, COMPLY WITH AUTHORITIES HAVING JURISDICTION, PROVIDE AS SPECIFIED ON PLAN.
- 1. INTERNALLY LIGHTED SIGNS.
- a) LAMPS FOR AC OPERATION: LED, 70,000 HOURS MINIMUM RATED LAMP LIFE.
- b) SELF-POWERED EXIT SIGNS (BATTERY TYPE), INTEGRAL AUTOMATIC CHARGER IN A SELF-CONTAINED POWER PACK.
- C. PROVIDE EMERGENCY LIGHTING UNITS, SELF-CONTAINED, COMPLYING WITH UL 924, PROVIDE AS SPECIFIED ON PLAN.
- D. LIGHTING FIXTURE SUPPORT COMPONENTS.
- 1. COMPLY WITH DIVISION 26 SECTION HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS' FOR CHANNEL- AND ANGLE-IRON SUPPORTS FOR NONMETALLIC CHANNEL AND ANGLE SUPPORTS.
- 2. SINGLE-STEM HANGERS: 1/2-INCH (13-MM) STEEL TUBING WITH SWIVEL BALL FITTINGS AND CEILING CANOPY. FINISH SAME AS FIXTURE.
- 3. TWIN-STEM HANGERS: TWO, 1/2-INCH (13-MM) STEEL TUBES WITH SINGLE CANOPY DESIGNED TO MOUNT A SINGLE FIXTURE. FINISH SAME AS FIXTURE.
- 4. WIRES: ASTM A 641/A 641M, CLASS 3, SOFT TEMPER, ZINC-COATED STEEL, 12 GAGE (2.68 MM).
- 5. ROD HANGERS: 3/16-INCH (5-MM) MINIMUM DIAMETER, CADMIUM-PLATED, THREADED STEEL ROD.
- 6. HOOK HANGERS: INTEGRATED ASSEMBLY MATCHED TO FIXTURE AND LINE VOLTAGE AND EQUIPPED WITH THREADED ATTACHMENT, CORD, AND LOCKING-TYPE PLUG.
- E. RECESSED FIXTURES IN FIRE RATED CEILING OR SUPPLY AIR PLENUMS SHALL BE APPROVED FOR THE FIRE RATING OF THE CEILING. PROVIDE AIRTIGHT GASKETS TO SEAL AROUND OPENINGS.
- F. ADJUSTABLE LUMINAIRES SHALL BE AIMED AND ADJUSTED DURING NON-DAYLIGHT HOURS TO THE SATISFACTION OF THE ARCHITECT.

SECTION 265600 - EXTERIOR LIGHTING

- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED ON PLAN OR PRE-APPROVED EQUIVALENT.
- B. LUMINAIRES SHALL COMPLY WITH UL 1588 AND BE LISTED AND LABELED FOR INSTALLATION IN WET LOCATIONS BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
- C. POLES AND SUPPORT COMPONENTS, GENERAL REQUIREMENTS
- 1. STRUCTURAL CHARACTERISTICS: COMPLY WITH AASHTO LTS-4.
- 2. LUMINAIRE ATTACHMENT PROVISIONS: COMPLY WITH LUMINAIRE MANUFACTURERS' MOUNTING REQUIREMENTS. USE STAINLESS-STEEL FASTENERS AND MOUNTING BOLTS, UNLESS OTHERWISE INDICATED.
- 3. CONCRETE POLE FOUNDATIONS: CAST-IN-PLACE OR PRE-CAST, WITH ANCHOR BOLTS TO MATCH POLE-BASE FLANGE. CONCRETE, REINFORCEMENT, AND FORMWORK ARE SPECIFIED IN DIVISION 03 SECTION "CAST-IN-PLACE CONCRETE." USE 3000 PSI (20.7 MPa) STRENGTH, 28-DAY CONCRETE.
- 4. GROUNDING AND BONDING LUGS: WELDED 1/2-INCH (13-MM) THREADED LUG, COMPLYING WITH REQUIREMENTS IN DIVISION 26 SECTION "GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS," LISTED FOR ATTACHING GROUNDING AND BONDING CONDUCTORS OF TYPE AND SIZE LISTED IN THAT SECTION, AND ACCESSIBLE THROUGH HANHOLE.

SECTION 270100 - BASIC COMMUNICATIONS REQUIREMENTS

- A. PROVIDE COMMUNICATION (FIBER AND/OR COPPER) SERVICE CONDUIT OR DUCT TO COMMUNICATION (FIBER AND/OR COPPER) BOARD AS SHOWN ON PLANS. SERVICE CONDUIT SIZE AND QUANTITY SHALL BE AS DETERMINED BY LOCAL COMMUNICATION (FIBER AND/OR COPPER) COMPANY.
- B. PROVIDE CONDUITS WITH CAT 6A CABLING, OUTLET BOXES, METAL CABINETS, AND PULL BOXES, JACKS AND COVERPLATES. PROVIDE A COMPLETE CONDUIT SYSTEM WITH CAT 6A CABLING AND JACKS AS INDICATED ON DRAWINGS.
- C. PROVIDE PLYWOOD TERMINAL BOARD AND WALL MOUNTED TELECOM RACKS AS SHOWN ON DRAWINGS.
- D. PROVIDE TESTING OF CABLING AND JACKS PER INDUSTRY STANDARD.
- E. PROVIDE LABELING OF CABLING AND JACKS PER BUILDING STANDARD, COORDINATE REQUIREMENT WITH OWNER.
- F. PROVIDE TERMINATIONS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.

NOTE: REFER TO TECHNOLOGY DRAWINGS OR/AND SPECIFICATIONS FOR SPECIFIC REQUIREMENTS.

SECTION 283100 - FIRE ALARM SYSTEM

- A. FIRE ALARM SYSTEM MUST BE INSTALLED IN ACCORDANCE WITH PLANS AND SPECIFICATIONS AND MUST MEET STATE AND LOCAL CODE REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE CODE REQUIRED DOCUMENTS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

 1. FLOOR PLAN THAT INDICATES THE USE OF ROOMS.
 2. LOCATIONS OF ALARM-INITIATING AND NOTIFICATION APPLIANCES.
 3. ALARM CONTROL AND TROUBLE SIGNALING EQUIPMENT.
 4. ANNUNCIATION.
 5. POWER CONNECTION.
 6. BATTERY CALCULATIONS.
 7. CONDUCTOR TYPE AND SIZES.
 8. VOLTAGE DROP CALCULATIONS.
 9. MANUFACTURERS, MODEL NUMBERS AND LISTING INFORMATION FOR EQUIPMENT, DEVICES AND MATERIALS.
 10. DETAILS OF CEILING HEIGHT AND CONSTRUCTION.
 11. INTERFACE OF FIRE SAFETY CONTROL FUNCTIONS.

- B. SCOPE SHALL BE FIRE ALARM SYSTEM FOR MODIFICATION OF EXISTING BUILDING LAYOUT AS INDICATED ON PLANS.
- C. SHOP DRAWINGS SHALL BE PREPARED BY PERSONS WITH THE FOLLOWING QUALIFICATIONS AND MUST BE SUBMITTED TO LOCAL AUTHORITIES FOR REVIEW AND APPROVAL PRIOR TO ROUGH IN OF SYSTEM.
- 1. TRAINED AND CERTIFIED BY MANUFACTURER IN FIRE ALARM SYSTEM DESIGN.
- 2. FIRE ALARM CERTIFIED BY NICET, MINIMUM LEVEL III.
- D. WIRING SHALL BE IN CONDUIT AND SHALL BE SIZED PER THE NATIONAL ELECTRICAL CODE. DO NOT RUN OTHER WIRING IN THE SAME CONDUIT WITH ALARM WIRING. WIRING SHALL BE SHIELDED CABLE. JUNCTION BOXES ASSOCIATED WITH FIRE ALARM SYSTEM SHALL BE SPRAY PAINTED FIRE ENGINE RED.
- E. WIRE AND CABLE MUST BE RATED PER LATEST REVISION OF NATIONAL ELECTRICAL CODE SECTION 760.
- F. CONFIRM WIRING REQUIREMENTS WITH PROPOSED FIRE ALARM SUPPLIER PRIOR TO BID AND PROVIDE IN ACCORDANCE WITH RECOMMENDATIONS. WIRE SIZES SHALL BE INCREASED AS REQUIRED FOR VOLTAGE DROP.
- G. WIRING SHALL BE CONTINUOUS FROM ONE DEVICE TO NEXT. SPLICING IS PROHIBITED.

- H. THE TYPICAL WIRING DIAGRAM IS NOT INTENDED TO SHOW QUANTITIES OF DEVICES. REFER TO PLANS FOR EXACT QUANTITIES.
- I. CONDUCTORS INCLUDING SHIELDS MUST TEST FREE OF OPENS, SHORTS AND GROUNDS BEFORE MAKING CONNECTION TO THE FIRE ALARM CONTROL PANEL.
- J. EACH FIRE ALARM PANEL REQUIRES A DEDICATED 120V, AC CIRCUIT, RUN 3#12 (INCLUDES THE GREEN GROUND WIRE) FROM A 20 AMP CIRCUIT BREAKER. PROVIDE A LOCK-ON CLIP AND RED MARKING ON BREAKER.
- K. SMOKE DETECTOR HEADS MUST BE INSTALLED FREE OF DUST OR ANY OTHER CONTAMINATION. SMOKE DETECTORS SHALL NOT BE MOUNTED WITHIN 3'-0" OF A SUPPLY OR RETURN AIR GRILLE. COORDINATE SMOKE DETECTOR LOCATIONS WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.
- L. IN ROOMS REQUIRING SMOKE DETECTION, IF THERE IS NOT A SMOOTH FLAT CEILING, THEN DETECTION SHALL BE SPACED PER NFPA 72. IF THERE ARE BEAM DEPTHS LESS THAN 10% OF THE CEILING HEIGHT (0.1XH), SMOOTH CEILING SPACES SHALL BE PERMITTED. IF THERE ARE BEAM DEPTHS EQUAL OR GREATER THAN 40% OF CEILING HEIGHT (0.4XH) SPOT SMOKE DETECTORS SHALL BE LOCATED ON THE CEILING IN EACH BEAM POCKET PER THE NFPA.
- M. HORNS AND STROBES SHALL BE WIRED SEPARATELY FOR SYNCHRONOUS OPERATION. PROVIDE SYNCHRONIZATION MODULES AS REQUIRED TO COMPLY WITH CODE.
- N. DUCT DETECTORS SHALL HAVE REMOTE TEST STATIONS INSTALLED IN AN ACCESSIBLE LOCATION AND BE CLEARLY LABELED TO INDICATE THEIR FUNCTION AND THE MECHANICAL UNIT ASSOCIATED WITH EACH DETECTOR. DUCT DETECTOR TEST STATIONS SHALL BE LOCATED AS CLOSE TO THE APPLIANCES AS POSSIBLE FOR EASE IN LOCATING AND UNLESS ASSOCIATED WITH ROOFTOP MECHANICAL UNITS.
- 1. IF THERE IS A DROP CEILING, THE REMOTE TEST STATIONS SHALL BE MOUNTED IN CEILING TILES BELOW THE DUCT DETECTORS.
- 2. IF THERE IS A DROP CEILING THE REMOTE TEST STATIONS SHALL BE MOUNTED IN CEILING NEXT TO A MINIMUM OF 2X4 OR 3X4" ACCESS PANEL LOCATED BELOW THE DUCT DETECTOR.
- 3. IF THERE IS NO CEILING, THE REMOTE TEST STATIONS SHALL BE MOUNTED ON A PILLAR OR WALL AS CLOSE TO THE DEVICE AS POSSIBLE.
- O. LOCATION OF DETECTORS IN AIR DUCT SYSTEMS SHALL BE PERMANENTLY AND CLEARLY IDENTIFIED AND RECORDED.
- P. DEVICES SHALL BE FIELD TESTED WITH WRITTEN CERTIFICATION OF SYSTEM. PERFORM ALL TESTS IN THE PRESENCE OF THE AUTHORITY HAVING JURISDICTION.
- Q. PROVIDE CONNECTION TO REMOTE SUPERVISION AS DIRECTED FOR SUPERVISION OF SYSTEM IN COMPLIANCE WITH LOCAL AUTHORITY AND OWNER. PROVIDE INTERFACE REQUIRED TO INITIATE REMOTE SUPERVISION.
- R. PROVIDE AND INSTALL A CEILING MOUNTED SMOKE DETECTOR IN FRONT OF FIRE ALARM CONTROL PANEL AND EACH REMOTE MOUNTED AUXILIARY PANEL IN ADDITION TO THE DEVICES SHOWN ON THE FLOOR PLANS.
- S. PROVIDE AND INSTALL A MANUAL STATION WHERE REQUIRED BY LOCAL AUTHORITIES TO MEET THE REQUIREMENTS OF NFPA 72. IN ADDITION TO DEVICES SHOWN ON THE PLANS. VERIFY WITH LOCAL AUTHORITY PRIOR TO BIDDING AND INDICATE COST IN BID PRICE.

PROVIDE WHITE DEVICES FOR NOTIFICATION AND SMOKE DETECTORS.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

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SIGNATURE: 

DATE 12/04/2025 LIC. NO. 63166

81-0373.03 COMM. NO.

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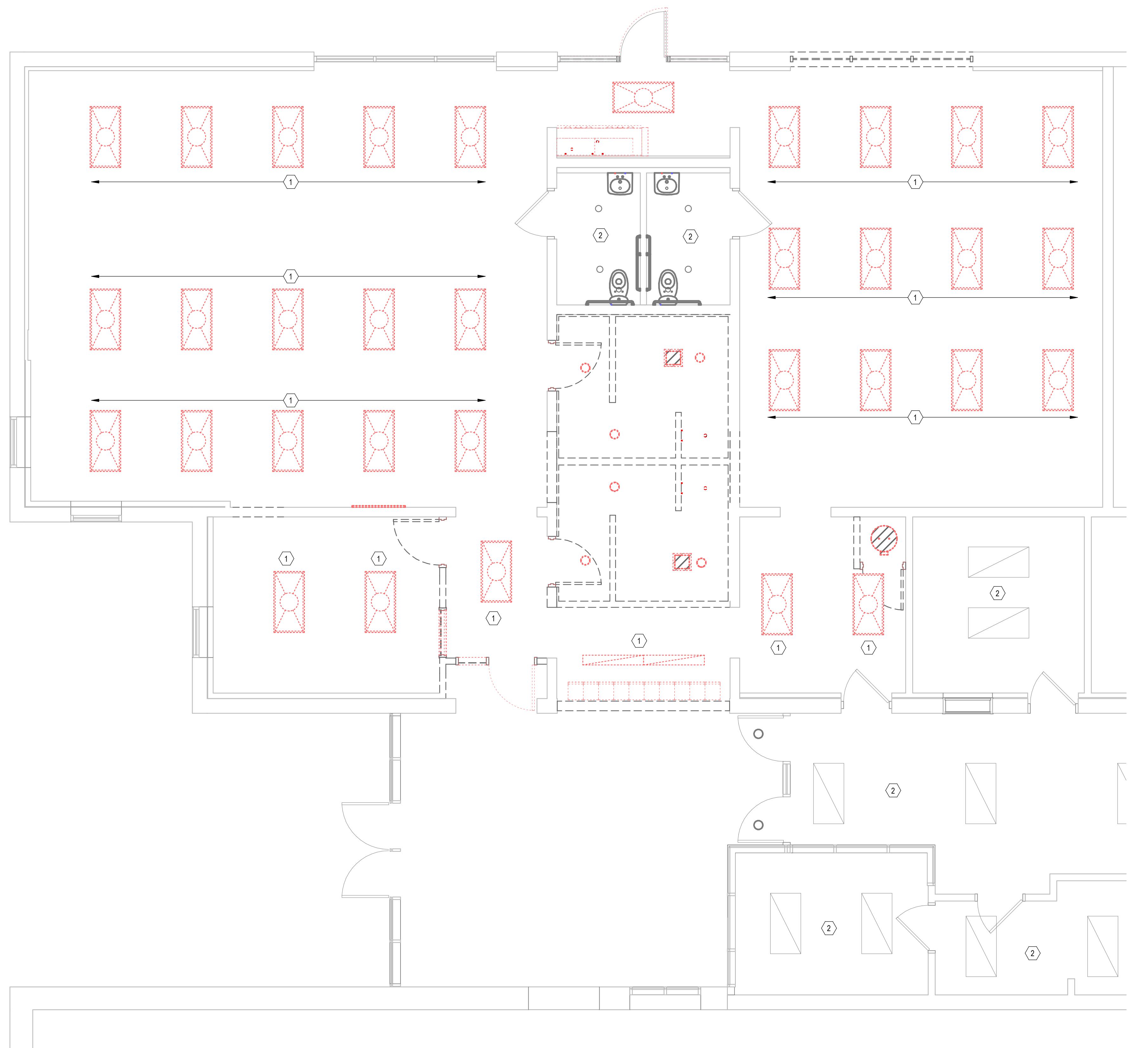
**ELECTRICAL
DEMOLITION PLAN**

KEYNOTES

- 1 REUSE THESE LIGHT FIXTURES AS REQUIRED
- 2 LIGHT FIXTURES IN THIS ROOM ARE EXISTING TO REMAIN.

ELECTRICAL DEMOLITION SHEET NOTES

- A. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR PHASES OF DEMOLITION AND CONSTRUCTION. COORDINATE WITH GENERAL CONSTRUCTION.
- B. DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES AND LIGHTING FIXTURES IN DEMOLITION AREAS UNLESS NOTED OTHERWISE.
- C. DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES IN WALLS TO BE DEMOLISHED. WALLS TO BE DEMOLISHED ARE SHOWN DASHED. DISCONNECT AND REMOVE ASSOCIATED CONDUIT AND WIRE BACK TO LAST REMAINING DEVICE. FURNISH AND INSTALL CONDUIT AND WIRE AS NECESSARY FOR CONTINUITY OF CIRCUIT(S) TO ANY EXISTING DEVICES TO REMAIN. COORDINATE AND VERIFY REQUIREMENTS WITH NEW WORK IN AREA.
- D. FURNISH AND INSTALL CONDUIT AND WIRE AS NECESSARY FOR OF ANY FEEDERS OR BRANCH CIRCUITS ORIGINATING OUTSIDE THE DEMOLITION AREA THAT SERVES ANY ELECTRICAL EQUIPMENT OR DEVICES TO REMAIN AFTER DEMOLITION. MODIFY OR REPLACE AS REQUIRED.
- E. FURNISH AND INSTALL CONDUIT AND/OR COMMUNICATIONS/DATA WIRING AS NECESSARY FOR CONTINUITY OF ANY WIRING ORIGINATING OUTSIDE THE DEMOLITION AREA THAT SERVES ANY COMMUNICATIONS/DATA EQUIPMENT OR DEVICES TO REMAIN AFTER DEMOLITION. MODIFY OR REPLACE AS REQUIRED.
- F. DISCONNECT AND REMOVE LIGHT SWITCHES IN DEMOLITION AREAS AS NECESSARY TO ACCOMMODATE NEW DOOR CONFIGURATIONS.
- G. DISCONNECT AND REMOVE ANY EXISTING ELECTRICAL DEVICES AND BACK BOXES AS NECESSARY WHERE NEW WALL CONSTRUCTION WILL INTERSECT AN EXISTING WALL. FURNISH AND INSTALL CONDUIT AND WIRE AS REQUIRED FOR CONTINUITY OF CIRCUIT(S).
- H. FURNISH AND INSTALL BLANK COVER PLATES FOR ALL EXISTING UNUSED OPENINGS.



1 LEVEL 1 ELECTRICAL DEMOLITION PLAN

1/4" = 1'-0"

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**FIRST FLOOR POWER
AND SYSTEM PLAN**

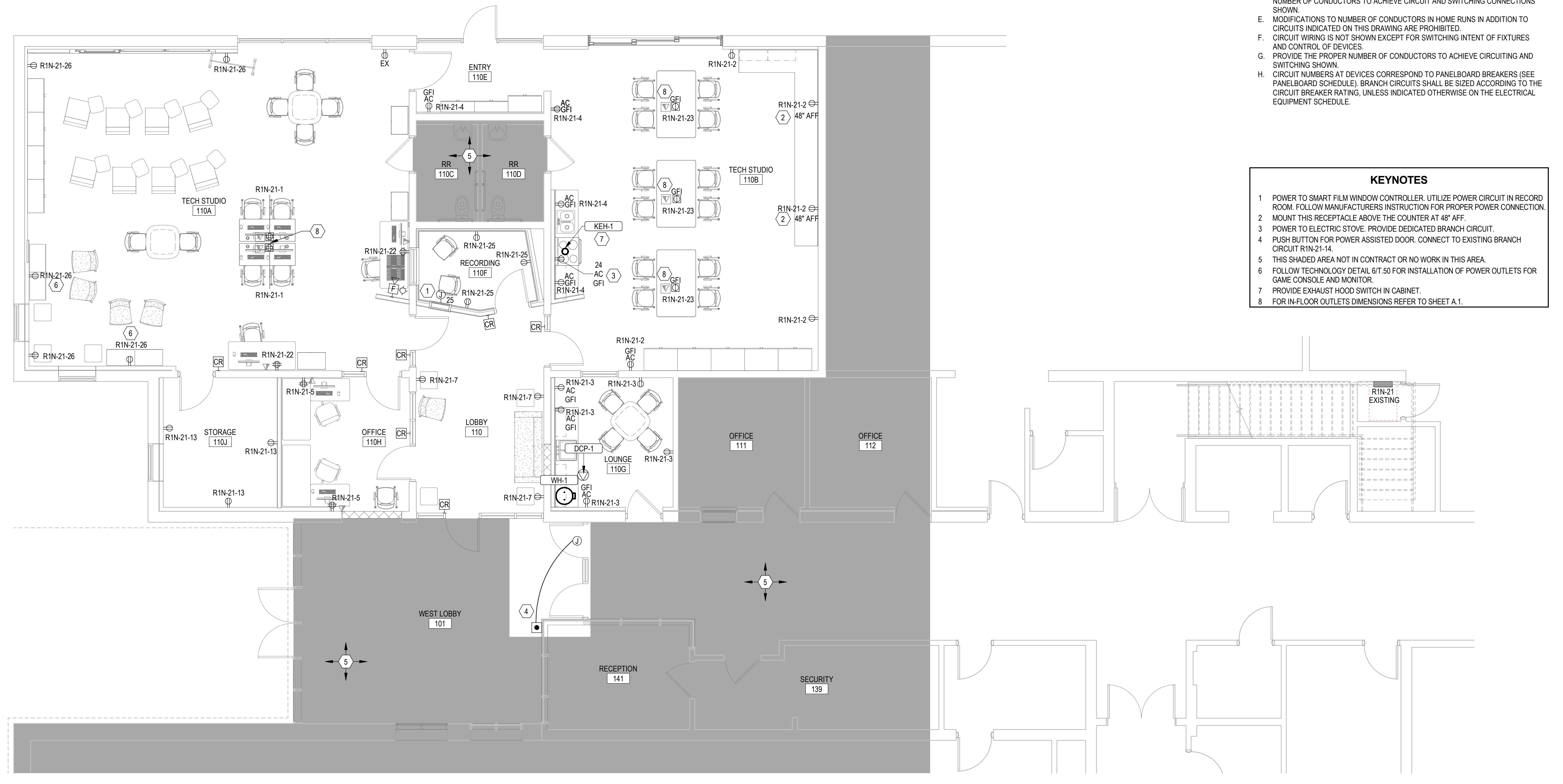
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POWER SHEET NOTES

- A. WHERE CONNECTED TO A 20A, BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.
- B. PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED, POLYFIBER REINFORCED CONCRETE, 4" WIDER AND 4" LONGER THAN EQUIPMENT TO BE PLACED ON IT. REFER TO ELECTRICAL DETAIL DRAWINGS FOR TRANSFORMER, GENERATOR, OR SWITCHGEAR PADS THAT MAY EXCEED THESE REQUIREMENTS.
- C. REFER TO SECTION 26 0519 FOR MINIMUM CONDUCTOR SIZE ADJUSTMENTS FOR VOLTAGE DROP.
- D. WIRE COUNTS FOR CIRCUIT CONDUCTORS ARE NOT SHOWN. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.
- E. MODIFICATIONS TO NUMBER OF CONDUCTORS IN HOME RUNS IN ADDITION TO CIRCUITS INDICATED ON THIS DRAWING ARE PROHIBITED.
- F. CIRCUIT WIRING IS NOT SHOWN EXCEPT FOR SWITCHING INTENT OF FIXTURES AND CONTROL OF DEVICES.
- G. PROVIDE THE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUITING AND SWITCHING SHOWN.
- H. CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE PANEL BOARD SCHEDULE). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL EQUIPMENT SCHEDULE.

KEYNOTES

- 1 POWER TO SMART FILM WINDOW CONTROLLER. UTILIZE POWER CIRCUIT IN RECORD ROOM. FOLLOW MANUFACTURERS INSTRUCTION FOR PROPER POWER CONNECTION.
- 2 MOUNT THIS RECEPTACLE ABOVE THE COUNTER AT 48" AFF.
- 3 POWER TO ELECTRIC STOVE. PROVIDE DEDICATED BRANCH CIRCUIT.
- 4 PUSH BUTTON FOR POWER ASSISTED DOOR. CONNECT TO EXISTING BRANCH CIRCUIT RIN-21-14.
- 5 THIS SHADED AREA NOT IN CONTRACT OR NO WORK IN THIS AREA.
- 6 FOLLOW TECHNOLOGY DETAIL 6/1.50 FOR INSTALLATION OF POWER OUTLETS FOR GAME CONSOLE AND MONITOR.
- 7 PROVIDE EXHAUST HOOD SWITCH IN CABINET.
- 8 FOR IN-FLOOR OUTLETS DIMENSIONS REFER TO SHEET A.1.



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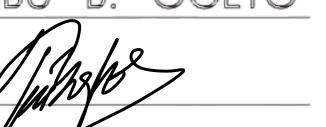
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Project No. 81-0373.03

**FOR BID & CONSTRUCTION
12/04/2025**

I HEREBY CERTIFY THAT THIS PLAN,
SPECIFICATION, OR REPORT WAS
PREPARED BY ME OR UNDER MY DIRECT
SUPERVISION AND THAT I AM A DULY
LICENSED PROFESSIONAL ENGINEER
UNDER THE LAWS OF THE STATE OF
MINNESOTA

PRINT NAME: **TIBEBU B. OGETO**

SIGNATURE: 

DATE **12/04/2025** LIC. NO. **63166**

81-0373.03 COMM. NO.

12/04/2025 DATE

TBO DRAWN

ALE CHECKED

NO ISSUE DATE

**FIRST FLOOR LIGHTING
PLAN**

LIGHTING GENERAL NOTES

- A. ALL RECESSED LIGHTING FIXTURES IN LAY-IN CEILINGS SHALL BE INSTALLED WITH 6' LONG FLEXIBLE METAL CONDUITS.
- B. ALL MOUNTING FOR LIGHTING FIXTURES ARE TO THE BOTTOM OF THE FIXTURES UNLESS INDICATED OTHERWISE.
- C. SEE ARCHITECTURAL EXTERIOR ELEVATIONS FOR MOUNTING HEIGHTS OF EXTERIOR LIGHTING FIXTURES.
- D. REFER TO SECTION 26 0519 FOR MINIMUM CONDUCTOR SIZE ADJUSTMENTS FOR VOLTAGE DROP.
- E. WIRE COUNTS FOR CIRCUIT CONDUCTORS ARE NOT SHOWN. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.
- F. MODIFICATIONS TO NUMBER OF CONDUCTORS IN HOME RUNS IN ADDITION TO CIRCUITS INDICATED ON THIS DRAWING ARE PROHIBITED.
- G. CIRCUIT WIRING IS NOT SHOWN EXCEPT FOR SWITCHING INTENT OF FIXTURES AND CONTROL OF DEVICES.
- H. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUITING AND SWITCHING SHOWN.
- I. CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE PANELBOARD SCHEDULE). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL EQUIPMENT SCHEDULE.

KEYNOTES

- 1 CONNECT ALL LIGHTING IN THIS AREA TO THE NEAREST EXISTING BRANCH CIRCUIT.
- 2 LIGHT FIXTURE IN THIS AREA TO BE RE-USED. REMOVE, STORE IN A SAFE LOCATION AND REINSTALL.
- 3 POWER ACTUATOR FOR LOBBY DOOR.
- 4 THIS SHADED AREA NOT IN CONTRACT OR NO WORK IN THIS AREA.



1 Level 1 Lighting Plan
1/4" = 1'-0"

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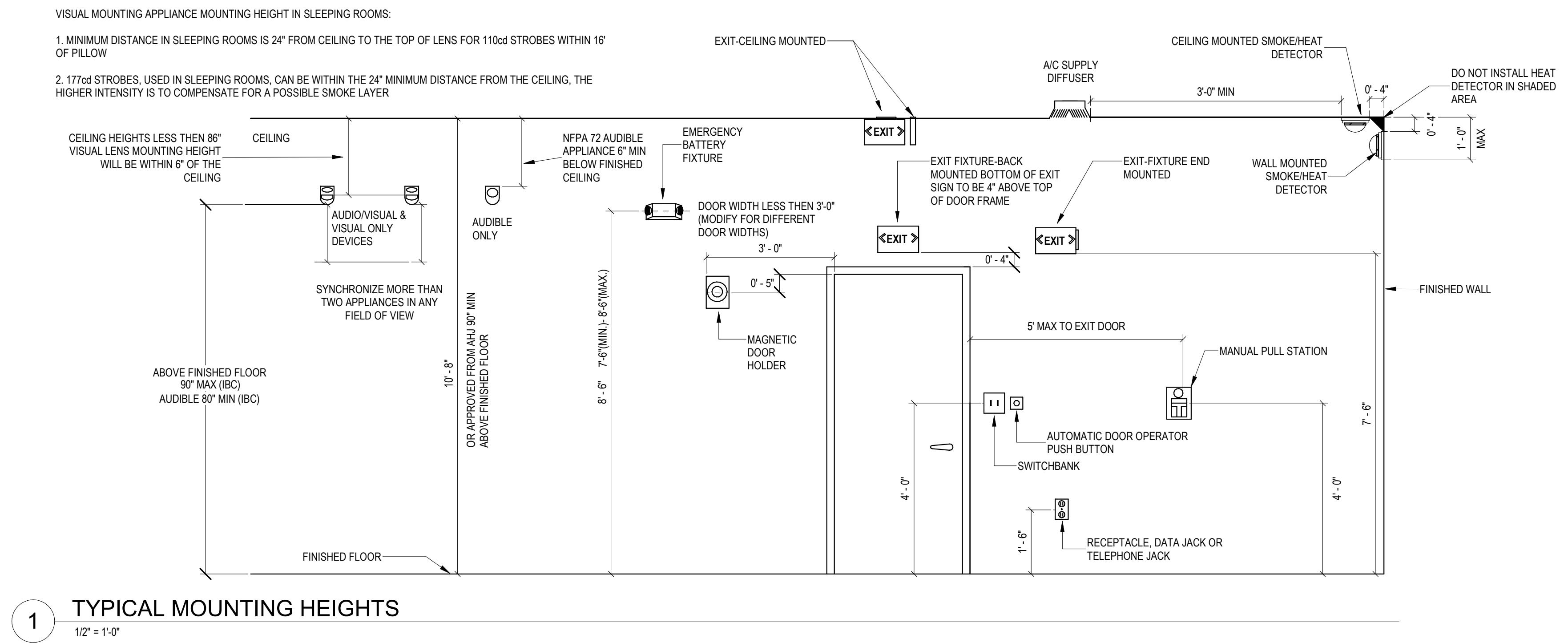
12/04/2025 DATE _____

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ELECTRICAL DETAILS



**MINNEAPOLIS PARK &
RECREATION BOARD**

**SPARK'D STUDIO
PHILLIPS
COMMUNITY CENTER**

2323 11TH AVENUE S
MINNEAPOLIS, MN 55404

AYRES

MECHANICAL, ELECTRICAL,
PLUMBING (MEP)
1700 West Highway 36 - Suite 700
Roseville, Minnesota 55113
(651) 639-9606 Fax (651) 639-9618
Project No. 81-0373.03

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PANEL SCHEDULES

Panelboard: R1N-21																																									
<table border="1"> <tr> <td>VOLTAGE: 208 V, 30, 4W</td><td colspan="3">MAINS TYPE: MCB</td></tr> <tr> <td>LOCATION: SUPPLY:</td><td colspan="3">MAIN'S RATING: 225 A</td></tr> <tr> <td>MOUNTING: Surface</td><td colspan="3">NEUTRAL: 100%</td></tr> <tr> <td>ENCLOSURE: NEMA 1</td><td colspan="3" rowspan="2">FEED-THRU: No</td></tr> <tr> <td colspan="12">FEATURES & MODIFICATIONS: -</td></tr> </table>												VOLTAGE: 208 V, 30, 4W	MAINS TYPE: MCB			LOCATION: SUPPLY:	MAIN'S RATING: 225 A			MOUNTING: Surface	NEUTRAL: 100%			ENCLOSURE: NEMA 1	FEED-THRU: No			FEATURES & MODIFICATIONS: -													
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CKT	DESCRIPTION	TRIP (A)	POLE S	FN/NOT E	PHASE A LOAD (VA)	PHASE B LOAD (VA)	PHASE C LOAD (VA)	FN/NOTE	POLE S	TRIP (A)	DESCRIPTION	CKT																													
1	FLOOR RECEPT TECH STUDIO..	20	1		360	900			1	20	RECEPTACLE TECH STUDIO 110B	2																													
3	RECEPTACLE LOUNGE 110G	20	1			900	720		1	20	RECEPTACLE TECH STUDIO 110B	4																													
5	RECEPTACLE - OFFICE 110H	20	1				360	0	1	20	NAC PANEL RM 117	6																													
7	RECEPTACLE LOBBY 110	20	1		540	0			1	20	HAND DRYER RM 140C	8																													
9	FAN MOTOR TECH STUDIO 110B	20	1			144	0		1	20	HAND DRYER RM 120C	10																													
11	REC. FITNESS CENTER 130A	20	1				0	0	1	20	POWER ASSISTED DOOR 101	12																													
13	STORAGE 110J	20	1		540	0			1	20	POWER ASSISTED DOOR 102	14																													
15	HAND DRYER RR 110D	20	1			0	5000		1	60	ELECTRIC WATER HEATER (WH-1)	16																													
17	HAND DRYER RR 110C	20	1				0	119	1	20	PUMP DCP-1	18																													
19	REC ROOM 143	20	1		0	0			1	20	EXISTING LOAD	20																													
21	SECURITY CONTROL PANEL RM..	20	1			0	720		1	20	TV OUTLET TECH STUDIO 110A	22																													
23	FLOOR RECEPT TECH STUDIO..	20	1			1080	2000		1	40	ELECTRIC STOVE	24																													
25	RECORDING 110F - RECEPTACLE	20	1		900	900			1	20	RECEPTACLE TECH STUDIO 110A	26																													
27	REC. RECEPTION 130A	20	1			0	0		1	20	REC. RECEPTION 135A	28																													
29	REC. AEROBICS 130B	20	1				0	0	1	20	REC. FITNESS CENTER 130A	30																													
31	REC. FITNESS CENTER 130A	20	1		0	0			1	20	REC. FITNESS CENTER 130A	32																													
33	REC. FITNESS CENTER 130A	20	1			0	0		1	20	REC. FITNESS CENTER 130A	34																													
35	REC. FITNESS CENTER 130A	20	1				0	0	1	20	REC. FITNESS CENTER 130A	36																													
37	REC. FITNESS CENTER 130A	20	1		0	0			1	20	REC. FITNESS CENTER 130A	38																													
39	REC. FITNESS CENTER 130A	20	1			0	0		1	20	REC. FITNESS CENTER 130A	40																													
41	REC. FITNESS CENTER 130A	20	1			0	0		1	20	TF-1	42																													
Connected Load: 4 kVA 7 kVA 4 kVA																																									
Connected Current: 35 A 63 A 30 A																																									
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BREAKER FUNCTION SCHEDULE	
#	FOR ANY NUMBER, SEE PANEL SCHEDULE FOOTER NOTE
A	ARC-FAULT INTERRUPTER (AFCI) PROTECTION
AR	ARC ENERGY REDUCTION MAINTENANCE SWITCH
D	DEMOLISHED CIRCUIT (NOW SPARE OR SPACE) (FORMER CIRCUIT IN BRACKETS)
E	EXISTING-TO-REMAIN CIRCUIT
EM	PROVIDE IDENTIFICATION PER NEC 700.12(I)(2)(4)
G	GROUND-FAULT CIRCUIT INTERRUPTER (GFCI) PROTECTION (5 mA)
GE	GROUND-FAULT PROTECTION FOR EQUIPMENT (30 mA)
GF	ADJUSTABLE GROUND-FAULT PROTECTION FOR EQUIPMENT
H	BREAKER HASP TO PREVENT UNINTENTIONAL OPENING
L	LOCKABLE OPEN ACCORDING TO NEC 110.25
LSI	LONG-TIME, SHORT-TIME, INSTANTANEOUS ADJUSTMENT
LSIG	LONG-TIME, SHORT-TIME, INSTANTANEOUS AND GROUND-FAULT ADJUSTMENTS
N	NEW CIRCUIT (IN EXISTING PANEL, PREVIOUSLY SPARE OR SPACE)
NB	NEW BREAKER TO REPLACE EXISTING CIRCUIT OR SPACE (NEW TRIP RATING SHOWN)
NR	NEW CIRCUIT TO REPLACE EXISTING CIRCUIT (FORMER CIRCUIT IN BRACKETS)
R	RELOCATED CIRCUIT

LUMINAIRE SCHEDULE																				
ID	DESCRIPTION	LENS/LOUVER	MOUNTING	DIRECT LUMENS	INDIRECT LUMENS	TOTAL LUMENS	LAMP	CCT	CRI	PROJECTED LIFE	BALLAST/DRIVER	VOLTAGE	WATTS	W/F/T	EMERGENCY COMPONENT	MANUFACTURER	MODEL NUMBER	EQUIVALENT MANUFACTURERS	NOTES	
R1	4" Downlight		Recessed	1404 lm	0 lm	1404 lm	Integral LED	3500 K	80	60,000 h	LED Driver, 0-10V Dimming, 1%	277 V	12 W		--	Indy	L4 13LM 35K MVOLT 80CRI EZ1 w/HM CS PF	--	--	
S3	2x4 Recessed	Curved Ribbed	Lay-In	4000 lm	0 lm	4000 lm	Integral LED	3500 K	82	60,000 h	LED Driver, 0-10V Dimming, 1%	277 V	32 W		--	Lithonia	2BLT4 40L ADP EZ1 LP835	--	RE-USE EXISTING FIXTURE S3	

MECHANICAL EQUIPMENT CONNECTION SCHEDULE																						
ID	EQUIPMENT DESCRIPTION	LOCATION	ELECTRICAL					CIRCUIT					DISCONNECTING AND CONTROL					TYPE	FURNISH	INSTALL	INTERLOCK	NOTES