

addendum

addendum no. 01

date: 02/26/2024

bid date: 03/05/2024

project name: State of NE 1526 K St Building Elevator Improvements

project no: 23125

This addendum is hereby made a part of the contract documents to the same extent as if it were originally included therein. Contract documents shall be considered modified or revised as hereinafter described.

general items

1. See attached pre-bid attendance roster

electrical items

1. Specifications –
 - a. Add attached division 26 specifications
2. Sheet E3.0 – Electrical Details
 - a. Added Luminaire Schedule.

Bidder questions

1. Q1: Please confirm that the DAS/State Building Division would like the hydraulic elevator jack replaced?
A1: Since documentation has been located that the jack was replaced by O'Keefe Elevator in 1996, the jack replacement on the service car will NOT be required. The jack packing shall be replaced by the contractor after the other hydraulic elevator improvements have been completed.
2. Q2: If the jack is retained, please confirm the rupture valve and 3" pit shut off will still need to be replaced?
A2: Confirmed. A new rupture valve will be required by code. In addition, a new 3" shut-off valve is required adjacent to the existing jack in the pit.
3. Q3: Will ECR cabs be an acceptable vendor for the new enclosures and cab interiors for the project?
A3: ECR is approved. Cab interior finishes shall match exactly the specified G&R EPIC solution, 700 EPIC series or GR701e.
4. Q4: Confirm surface mount hall stations are acceptable for project.
A4: Confirmed. Surface mount hall fixtures are acceptable.

5. Q5: Would DAS/State Building Division consider Geared Machines with ReGen Drives as an alternate for the project?
A5: Geared machines with AC motors are acceptable as long as regenerative drives are provided.
6. Q6: Unit on main floor had a wireless t-stat and unit on roof had wired. In the mechanical drawings it calls for wired t-stats, do we want to see an option on wireless? This would mainly save on electrical conduit, wiring and labor.
A6: Contractor may provide voluntary alternate VE item in bid for wireless thermostat. Acceptance of alternate to be reviewed after acceptance of bid.
7. Q7: Line set clarification- if the new units take same size line sets can we flush existing and reuse? Or do we need to run new lines regardless?
A7: Provide new lines.
8. Q8: Current line set differs from mechanical drawings at ground floor split system, if we run new lines do we price according to drawings or how they are run now?
A8: Price to run lines in same path as existing.

end of addendum

First Nebraska Administration Building Elevator Modernization Project Pre-Bid Sign In Sheet

Date: 02/21/2024, Time: 11:00 AM Location: First Nebraska Administration Building Lower-Level Lobby.

Name	Organization	Email	Phone #
Kevin Herr	State Building Division	kevin.herr@nebraska.gov	402-641-4880
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First Nebraska Administration Building Elevator Modernization Project

Pre-Bid Sign In Sheet

Date: 02/21/2024, **Time:** 11:00 AM **Location:** First Nebraska Administration Building Lower-level lobby.

Name	Organization	Email	Phone #
Kevin Herr	State Building Division	kevin.herr@nebraska.gov	402-641-4880
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Jon Aulner	kingary	jon@kcobuilds.com	402-610-1175
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SECTION 260100 – GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

- A. This Section includes general electrical requirements and shall apply to all phases of the work specified, indicated on the drawings or required to provide for complete installation of electrical systems.

1.3 WARRANTIES

- A. All materials, workmanship and equipment shall be warranted against defects or against injury from proper and usual wear for a period of one year after the date of substantial completion. Certain equipment shall be warranted beginning at the time of final acceptance or for longer periods of time as specified in those sections of the Project Manual. Any item which becomes defective within the warranty period shall be repaired or replaced, at no additional cost to the Owner.
- B. All manufactures warranties shall run to the benefit of the Owner. No manufacturer's warranties shall be voided or impaired.
- C. Warranty shall include repair of faulty workmanship.

1.4 INTERPRETATION OF DOCUMENTS

- A. Any questions regarding the meaning of any portion of the contract documents shall be submitted to the Architect/Engineer for interpretation. Addenda or supplemental information will publish definitive interpretations or clarification. Verbal interpretation not issued by addendum or supplemental information shall not be considered part of the contract documents.
- B. The Architect/Engineer shall be the sole judge of interpretations of discrepancies within the contract documents.
- C. If ambiguities should appear in the contract documents, the Contractor shall request clarification from the Architect/Engineer before proceeding with the work. If the Contractor fails to make such request, no excuse will thereafter be entertained for failure to carry out the work in a manner satisfactory to the Architect/Engineer. Should a conflict occur within the contract documents, the Contractor is deemed to have estimated the more expensive way of doing the work unless a written clarification from the Architect/Engineer was requested and obtained before submission of proposed methods or materials.

1.5 DEFINITIONS ABBREVIATIONS

- A. The following shall apply throughout the contract documents

1.	Code	All applicable national state and local codes
2.	Furnish	Supply and deliver to site ready for installation
3.	Indicated	Noted, scheduled or specified
4.	Provide	Furnish, install and connect complete and ready for final use by Owner
5.	ADA	Americans with Disabilities Act
6.	ANSI	American National Standards Institute
7.	ASTM	American Society for Testing and Materials
8.	FM	Factory Mutual System
9.	IRI	HSB Industrial Risk Insurers
10.	NEC	National Electric Code (NFPA 70)
11.	NEMA	National Electrical Manufacturers Association
12.	NFPA	National Fire Protection Association
13.	UL	Underwriters Laboratories Inc.

1.6 CODES AND STANDARDS

- A. All work shall be performed by competent craftsmen skilled in the trade involved and shall be done in a manner consistent with normal industry standards.
- B. All work shall conform to the currently adopted edition of the National Electric Code (NEC), Local Building Code, and all other applicable state and local codes or standards.
- C. Where there is a conflict between the code and the contract documents, the code shall have precedence only when it is more stringent than the contract documents. Items that are allowed by the code but are less stringent than those specified shall not be substituted.

1.7 PERMITS

- A. Contractor shall become familiar and comply with all requirements regarding permits, fees, licenses, etc. All permits, licenses, inspections and arrangements required for the work shall be obtained by Contractor's effort and expense. All utilities shall be installed in accordance with the local rules and regulations and all charges shall be paid by the Contractor. Capital facilities fees will be paid by Owner.

1.8 SUBMITTALS

- A. Division 1 section "Submittals" shall be adhered to if more stringent than this section.
- B. Shop drawings shall be submitted to Architect/Engineer for review when required by other sections of this specification and **for all equipment scheduled or specified on drawings.**
 - 1. A letter of transmittal shall accompany each submittal. Submittals shall be numbered consecutively and list products covered.
 - 2. Unless otherwise noted, submit a minimum of six (6) copies of shop drawing and product data for review.
- C. Shop Drawings
 - 1. Shop drawings include fabrication and installation drawings, diagrams, schedules of other data specifically prepared for the project. Include dimensions and notations showing compliance with specified standards.

2. Drawing sheet size shall be at least 8 ½" x 11" and no longer than 30" x 42". For sheets larger than 11" x 17", submit one sheet of reproducible media and one blue-line or photocopy print. Architect/Engineer action will be returned on reproducible media.

D. Product Data

1. Product data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, rough-in diagrams, wiring diagrams and performance curves.
 2. Each copy shall clearly indicate conformance with specified capacities, characteristics, dimensions and details. Mark all equipment with same item number as used on drawings. Mark each copy to clearly indicate applicable choices and options.
- E. Architect/Engineer will review or take appropriate action for submittals. Review is only to determine general conformance with design shown in contract documents.
- F. Architect/Engineer review of submittals shall not relieve contractor of responsibility for deviation from requirements of the contract documents or from errors or omissions within submittals.
- G. No portion of the work requiring submittals shall be commenced until the Architect/Engineer has reviewed the submittal.
- H. Electronic Floor Plan Drawings in AutoCAD 2002 format may be requested for use in preparation of shop drawings. Morrissey Engineering reserves the right to reject requests for electronic drawings. Electronic files shall be prepaid at \$50/sheet. Submit written request to Morrissey Engineering or email request to info@morrisseyengineering.com. Indicate the project name, and floor plan sheets requested. The use of these drawings is intended solely for preparation of drawings required by this specification. Copyright law prohibits any other use. The user of the electronic files assumes full responsibility for the accuracy and scale of the drawings.
- I. See "Submittal Schedule" at the end of Section 260100 – General Electrical Requirements.

1.9 OPERATION AND MAINTENANCE MANUALS

- A. Assemble three (3) complete sets of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
1. Operation Data:
 - a. Emergency instructions and procedures.
 - b. System, subsystem, and equipment descriptions, including operating standards.
 - c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
 - d. Description of controls and sequence of operations.
 - e. Piping and wiring diagrams.
 2. Maintenance Data:
 - a. Manufacturer's information, including list of spare parts.
 - b. Name, address, and telephone number of installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventive and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of maintenance service agreements.

- h. Copies of warranties and bonds.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.10 PROJECT RECORD DOCUMENTS

- A. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
 - 1. Mark Record Prints to show the actual installation where installation varies from that shown originally.
 - 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - 3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 - 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials and equipment used in the construction of the project shall be new unused and undamaged unless otherwise specified. Materials and equipment shall be of latest design standards of manufacturer specified.
- B. Materials and equipment are limited by the requirements of the contract documents. Material and equipment shall be provided in accordance with the following:
 - 1. Basis of Design Products: Basis of Design Products are those products around which the project was designed in terms of capacity, performance, physical size and quality. Basis of Design Products shall be provided unless substitutions are made in accordance with this specification.
 - 2. Substitutions: Substitutions are product of manufacturers other than listed as Basis of Design. Substitutions shall meet each of the following requirements and shall be subject to prior approval. Submissions requesting prior approval shall be received by the engineer no less than ten (10) days prior to project bid date.
 - a. The product shall be manufactured by one of the acceptable manufacturers listed in the contract documents.

- b. The product shall meet or exceed the requirements of the contract documents in terms of quality, performance, suitability, appearance and characteristics.
 - c. The contractor providing the substitution shall bear the total cost of all changes due to substitutions. These may include but are not limited to redesign costs and increased work by other contractors or the Owner.
 - d. The Architect/Engineer shall be the sole judge of the suitability of the substitution items.
- C. Verify installation details and requirements for materials and equipment furnished by others and installed under this contract.

PART 3 - EXECUTION

3.1 STARTING AND ADJUSTING

- A. Start and test all equipment and operating components to confirm proper operation. Test and adjust all systems to achieve designed capacity and performance.
- B. Provide three (3) copies of all test report to the Architect/Engineer for review prior to date of substantial completion.
- C. All equipment and systems discrepancies shall be corrected prior to final acceptance.

3.2 TEMPORARY POWER AND LIGHTING

- A. Electric Power Service: Provide temporary electric power from Owner's electric system without payment of use charges.
- B. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and construction equipment.
- C. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.

ELECTRICAL SUBMITTAL SCHEDULE

Section #	Section Name	Shop Drwgs	Product Data	Samples	Warranty	Other
260100	General Electrical Requirements	√	√			
260500	Basic Electrical Materials and Methods	√	√			
262816	Disconnect Switches and Circuit Breakers		√			
265100	Lighting	√	√		√	

END OF SECTION 260100

SECTION 260500 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following basic electrical materials and methods and shall apply to all phases of the work specified, indicated on the drawings or required to provide for complete installation of electrical systems.
 - 1. Conduits.
 - 2. Building wire and connectors.
 - 3. Supporting devices for electrical components.
 - 4. Outlet boxes.
 - 5. Electrical identification.
 - 6. Electrical demolition.
 - 7. Work in existing buildings.
 - 8. Cutting and patching for electrical construction.
 - 9. Fire Stopping.
 - 10. Touchup painting.

1.3 MATERIAL QUALITY ASSURANCE

- A. Electrical components, devices, and accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.4 COORDINATION

- A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
 - 1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
- B. Sequence, coordinate, and integrate installing of electrical materials and equipment with other trades.
- C. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces.
- D. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

- E. Where electrical identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Each contractor shall make provisions for delivery and safe storage of materials. Materials shall be delivered in a timely manner to expedite the work.
- B. Protect stored piping, supplies and equipment from cold, moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor, if stored inside.

PART 2 - PRODUCTS

2.1 CONDUITS

- A. Electrical metallic tubing (EMT): ANSI C80.3 and UL 797, zinc-coated steel with steel or die cast, set-screw or compression type fittings.
- B. Flexible metal conduit (FMC): UL 1, Zinc-coated steel.
- C. Intermediate metal conduit (IMC): ANSI C80.6 and UL 1242, zinc-coated steel, with threaded fittings.
- D. Liquidtight flexible metal conduit (LFMC): Flexible steel conduit with PVC jacket and complying with UL 360.
- E. Rigid nonmetallic conduit (RNC): NEMA TC 2 and UL 651, EPC-40 (schedule 40) PVC, with NEMA TC3 fittings.
- F. Installation location shall determine conduit type permitted.
 - 1. For indoor installations:
 - a. Exposed: EMT.
 - b. Concealed: EMT.
 - c. Connection to vibrating equipment: FMC; except in wet or damp locations, use LFMC.
 - d. Boxes and enclosures: NEMA 250, Type 1, unless otherwise indicated.
 - 2. Use the following conduits for outdoor installations:
 - a. Exposed: IMC.
 - b. Underground: RNC.
 - c. Boxes and enclosures: NEMA 250, Type 3R or Type 4.
 - 3. At motors:
 - a. Connect motors and equipment subject to vibration, noise transmission, or movement with FMC of 72-inch maximum length.
 - b. Damp locations: LFMC.
- G. Conduit fittings: Specifically designed for the conduit type with which used. Comply with NEMA FB 1 and UL 514B.

2.2 CONDUCTORS

- A. Conductors and conductor insulation: Comply with NEMA WC 70.
- B. Conductors, No. 10 AWG and Smaller: Solid or stranded copper.
- C. Conductors, larger than No. 10 AWG: Stranded copper.
- D. Insulation: thermoplastic, rated at 75 deg C minimum.
 - 1. Feeders: Type THHN/THWN insulated conductors in conduit.
 - 2. Underground Feeders and Branch Circuits: Type THWN in conduit.
 - 3. Branch Circuits: Type THHN/THWN insulated conductors in conduit.
 - 4. Circuits over 100 feet from GFCI devices and all circuits from line isolation panels: Low-leakage XHHW in conduit.
- E. Wire connectors and splices: Units of size, ampacity rating, material, type, and class suitable for service indicated.
- F. Unless otherwise indicated on the drawings, circuits are to be 20 amps with #12 AWG wire.
- G. **A green ground shall be installed with all branch and feeder circuits.** Unless otherwise indicated on the drawings, ground wires are to be #12 AWG.
- H. Provide a dedicated neutral conductor for each 120V and 277V branch circuit unless otherwise indicated on drawings.

2.3 SUPPORTING DEVICES

- A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.
- B. Metal items for use outdoors or in damp locations: Hot-dip galvanized steel.
- C. Slotted-steel channel supports: Flange edges turned toward web, and 9/16-inch- diameter slotted holes at a maximum of 2 inches o.c., in webs.
- D. Conduit and cable supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.
 - 1. In general, use the following support methods for outdoor **conduit** installations:
 - a. Individual exposed conduit: 1" and smaller; 2 hole straps.
 - b. Individual exposed conduit: 1-1/4" and larger; Minerallac.
 - c. Paired individual exposed conduit: Minerallac.
 - d. Rack exposed conduit: Unistrut with strut straps.
 - e. Concealed in concrete pour: Approved iron tie wire.
 - 2. In general, use the following support methods for indoor **conduit** installations:
 - a. Individual exposed conduit: 1" and smaller; 2 hole straps.
 - b. Individual exposed conduit: 1-1/4" and larger; Minerallac.
 - c. Individual lighting and power above lay-in ceilings: Dedicated ceiling wire with Caddy clips.

- d. Racked exposed or concealed conduit: Unistrut with strut straps.
- E. Pipe sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
- F. Expansion anchors: Carbon-steel wedge or sleeve type.
- G. Toggle bolts: All-steel springhead type.
- H. Powder-driven threaded studs: Heat-treated steel.

2.4 BOXES

- A. Hollow wall and ceiling spaces: Outlet boxes for concealed applications shall be 4" square with single or multiple gang plaster ring in round or square configuration to match the device or fixture being installed. Depth of ring shall be selected so that face of ring is recessed back from face of finished surface by approximately 1/8".
- B. Exposed exterior boxes: Where exposed boxes are required, they shall be the cast type with threaded hubs and gasketed covers. **Use of these boxes is by approval only. Flush mounted boxes and conduit are to be used unless otherwise indicated.**
- C. Interior junction boxes: Interior junction boxes shall be 4" square minimum with knock outs as required. Larger boxes may be required and shall be sized per NEC. Provide a flat steel coverplate.
- D. Specialty junction boxes larger than 4 11/16": Junction and pull boxes shall be sized per NEC and arranged to facilitate pulling or splicing. Boxes shall be steel without knock outs, with hinged or screw on cover plates.

2.5 ELECTRICAL IDENTIFICATION

- A. Underground warning tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
 - 1. Not less than 6 inches wide by 4 mils thick.
 - 2. Compounded for permanent direct-burial service.
 - 3. Embedded continuous metallic strip or core.
 - 4. Printed legend that indicates type of underground line.
- B. Tape markers for wire: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
- C. Engraved-plastic labels, signs, and instruction plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch minimum thickness for signs up to 20 sq. in. and 1/8-inch minimum thickness for larger sizes. Engraved legend in black letters on white background.

2.6 ACCESS DOORS

- A. Prime coated 14 gauge steel, flush, with screw driver operated cam lock. Frame to accommodate construction type; size as indicated.

PART 3 - EXECUTION

3.1 ELECTRICAL EQUIPMENT INSTALLATION

- A. Quality of workmanship: A neat and workmanlike installation shall be provided as defined in the National Electrical Installation Standards (NEIS) established by the National Electrical Contractors Association (NECA). NEIS standards shall be followed for all work including that which is concealed by construction.
- B. Neatness and craftsmanship shall be a priority. Installations shall be subject to regular observations performed by the Engineer or the Engineer's Representative. If an installation is deemed unsatisfactory by the Engineer or the Engineer's Representative due to quality of workmanship, code conflicts or deviations from the Construction Drawings or Specifications, the Contractor shall remedy the installation to the satisfaction of the Engineer.
- C. Inspect installed components for damage and faulty work, including the following:
 - 1. Conduits.
 - 2. Building wire and connectors.
 - 3. Supporting devices for electrical components.
 - 4. Electrical identification.
 - 5. Concrete bases.
 - 6. Cutting and patching for electrical construction.
 - 7. Touchup painting.
- D. Headroom maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.
- E. Materials and components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
- F. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- G. Right of way: Give to conduits and piping systems installed at a required slope.

3.2 CONDUIT AND CABLE INSTALLATION

- A. Conceal conduit and cables, unless otherwise indicated, within finished walls, ceilings, and floors.
- B. Install conduit and cables at least 6 inches away from parallel runs of flues or hot-water pipes. Locate horizontal conduit runs above water piping.
- C. Use temporary conduit caps to prevent foreign matter from entering.
- D. Make conduit bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.
- E. Use conduit and cable fittings compatible with conduit and cables and suitable for use and location.
- F. Conduits may be installed embedded in concrete under the following conditions:
 - 1. Contractor shall receive approval from a structural engineer if conduit is to be located in structural concrete.
 - 2. Leave at least 2-inch concrete cover.

3. Do not displace more than 1/3 of the concrete thickness of the slab. For example, if the slab thickness is 3", maximum conduit size is to be 1" OD.
 4. Secure conduit to reinforcing rods to prevent sagging or shifting during concrete placement.
 5. Where multiple conduits are run in an area, space conduit laterally to prevent voids in concrete. Fan out conduit runs for a minimum spacing of no less than 3 times the diameter of the larger conduit in a group. Do not place conduits within 12" of supporting beams, walls and columns.
 6. Install conduit larger than 1-inch trade size parallel to or at right angles to main reinforcement. Where conduit is at right angles to reinforcement, place conduit close to slab support.
 7. Where floor finish is to be exposed concrete, avoid excessive underfloor conduits and maximize cover over conduits to avoid floor cracking.
 8. Transition from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above floor.
- G. Make bends in exposed parallel or banked runs from same centerline to make bends parallel. Use factory elbows where elbows can be installed parallel; otherwise, provide field bends for exposed parallel conduits.
- H. Install pull wires in empty conduits. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of the pull wire.
- I. Install interior telephone and signal system conduits in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements, in addition to requirements above.
- J. Install exterior telephone and signal system conduits in maximum lengths of 500 feet and with a minimal number of 90-degree bends.
- K. Utilize sweep elbows for all telephone and signal system conduits 2" and larger.
- L. All **conduits routed through unfinished spaces** shall be routed as high as allowable to avoid future conflicts with build out.
- M. All conduits routed exposed in finished spaces shall be painted to match the surroundings.
- N. Route conduits parallel to building structural members in a neat and orderly manner.

3.3 CONDUIT SUPPORT INSTALLATION

- A. Install support devices to securely and permanently fasten and support electrical components.
- B. Install individual and multiple conduit hangers and riser clamps to support conduits. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.
- C. Size supports for multiple conduits so capacity can be increased by a **25 percent minimum** in the future.
- D. Install 1/4-inch diameter or larger threaded steel hanger rods, unless otherwise indicated.
- E. Simultaneously install vertical conductor supports with conductors.
- F. Separately support cast boxes that are threaded to conduits and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to conduits on opposite sides of the box and support the conduit with an approved fastener not more than 24 inches from the box.

- G. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength. Use factory hardware for all connections and assemblies including 45 and 90 degree attachment hardware.
- H. Install sleeves for cable and conduit penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and conduit penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.
- I. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:
 - 1. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
 - 2. New concrete: Concrete inserts with machine screws and bolts.
 - 3. Light steel: Sheet-metal screws.
 - 4. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

3.4 WIRING INSTALLATION

- A. Install splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- B. Install wiring at outlets with at least 12 inches of slack conductor at each outlet.
- C. Connect outlet and component connections to wiring systems and to ground. Tighten electrical connectors and terminals, according to manufacturer's published torque-tightening values.

3.5 POSITION OF DEVICE OUTLETS

- A. Outlets shall be installed at the height indicated below unless otherwise noted. All heights of outlets are measured from finished floor to centerline of device. Heights may be adjusted as necessary to clear wall mounted cabinets, fin tube convectors, unit heaters, etc. Where installed in masonry walls, mounting heights may be adjusted to correspond to block coursing. In no case shall outlets be mounted below 15" or switches above 48":

- | | |
|--------------------------------|------|
| 1. Wall switches | 44". |
| 2. Receptacle outlet (general) | 16". |
| 3. Exterior receptacles | 24" |

3.6 ELECTRICAL IDENTIFICATION

- A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
- C. Self-Adhesive Identification Products: Clean surfaces before applying.

- D. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.
- E. Install warning markers directly above power and communication lines during trench backfilling for underground power, control, signal, and communication lines. Locate marker 6 to 8 inches below finished grade unless required otherwise by NEC. Markers shall be continuous and detectable with a metal detector from above ground after backfilling. Provide one strip of marker for each 16 inches of width if multiple lines are installed in a common trench or concrete envelope.
- F. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
 - 1. Match existing building identification
- G. Color-code 480/277-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
 - 1. Match existing building identification

3.7 FIRESTOPPING

- A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly and to resist passage of smoke and other gases. Products designed to achieve a fire or smoke resistance rating shall not be used in locations where such ratings are not required by AHJ. Coordinate location requirements with other disciplines and AHJ prior to installation.
 - 1. Limit air leakage to 5.0cfm per square foot tested in accordance with UL 1479.
 - 2. Materials labeled by a qualified testing agency acceptable to AHJ.
 - 3. Comply with manufacturer's written installation instructions and published drawings
 - 4. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - a. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - b. Contractor's name, address, and phone number.
 - c. Designation of applicable testing and inspecting agency.
 - d. Date of installation.
 - e. Manufacturer's name.
 - f. Installer's name.
- B. All firestopping assemblies shall be from one manufacturer. Match manufacturer used by other trades or as directed by general contractor.
- C. Where electrical outlets are to be installed in fire rated walls, provide FlameSafe FSP1077 putty pads or equal to maintain adequate fire rating.
- D. Where lighting fixtures or other electrical devices are to be installed in fire rated ceilings, provide Tenmat Fire Rated Light Covers or equal to maintain adequate fire rating.

3.8 HOUSEKEEPING PADS

- A. Provide a 3-1/2 inch tall concrete housekeeping pad for all floor mounted interior electrical equipment as follows:
 - 1. Pad shall extend 4-6" beyond all sides of equipment, except in the back for switchboards mounted tight against the wall.
 - 2. Constructed of 3000 psi concrete.
 - 3. Provide 6" x 6" #4 welded wire mesh.
 - 4. Securely bond pad to floor by roughing the floor and coating with cement grout.

3.9 DEMOLITION

- A. Disconnect, demolish, and remove construction indicated in specifications and drawings.
- B. The Owner shall have first salvage rights to all fixtures, devices and equipment removed. Present removed materials to owner's representative. Materials not retained by owner's representative shall be removed from project site.
- C. If equipment to remain is damaged or disturbed, remove damaged portions and install new products of equal capacity and quality.
- D. Remove, store, clean, reinstall, reconnect, and make operational equipment indicated for relocation.
- E. Remove all accessible conduit unless otherwise noted.
- F. Remove branch circuit conductors and low voltage cable in area of demolition not reused in new work or planned for future use. Where left for future use, label wire at both ends and at each junction box.
- G. Power to existing areas not being remodeled shall be maintained at all times except for short term outages necessary for reconnection of existing circuits. Coordinate and schedule outages with owner.
- H. Coordinate demolition with the work of other trades. Provide temporary power as required to allow the work of other trades to proceed or as required to allow the owner to occupy the space.
- I. See architectural plans to determine project phasing requirements. Electrical circuits serving areas not under construction shall remain active until those areas are turned over to the contractor for construction.
- J. Work abandoned in place: Cut and remove underground conduit a minimum of 2 inches beyond face of adjacent construction. Cap and patch surface to match existing finish.

3.10 WORK IN EXISTING BUILDINGS

- A. Full Owner Occupancy: The Owner will occupy the site and existing building during the construction period. Cooperate with the Owner to minimize conflicts with the Owner's operations.
- B. Schedule all work in advance with the owner. Do not proceed with work without the Owner's written approval.
- C. Notify Owner of noisy operations and schedule in advance.
- D. The Owner shall have the right to direct work to secure safe and proper progress and quality of work.

- E. Do not interrupt utilities without Owner's written approval of time and duration. Interruptions shall be the minimum required for completion of work and performed during the hours of 10:00 PM-6:00 AM Monday through Friday or 6:00 PM Saturday through 6:00 AM Monday.
- F. The existing fire alarm system shall remain functional throughout the project. The Owner and the Fire Marshal shall approve required outages.
- G. The Owner shall be notified before starting welding or cutting. Fire extinguishers shall be immediately accessible when welding or cutting with an open flame or arc. Welding or cutting with an open flame or arc shall be stopped not less than one hour before leaving the premises.
- H. Existing electrical items that interfere with the proper installation new work shall be removed or relocated as required or as directed by the Architect/Engineer.
- I. Maintain downstream circuit continuity to equipment to remain active.
- J. Where breakers are indicated to be installed in existing panelboards, remove panel covers and verify all connection details prior to ordering of breakers. Provide all required hardware for installation of breakers in existing panels.

3.11 CUTTING AND PATCHING

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for electrical installations. Perform cutting by skilled mechanics of trades involved.
- B. Repair cut surfaces to match adjacent surfaces.

3.12 CONSTRUCTION LAYOUT

- A. Layout work in advance of installation using data and measurements from the site, the appropriate architectural and structural drawings and shop drawings.
- B. Confirm adequate clearance for installation, operation, maintenance and code required clearance including items installed by other contractors.
- C. If layout to provide clearance is not possible, promptly notify Architect/Engineer for clarification.

3.13 DATA AND MEASUREMENTS

- A. The data given herein and on the drawings is as accurate as could be secured. The existence and location of construction as indicated is not guaranteed. Before beginning work investigate and verify the existence and location of items affecting work. Obtain exact locations, measurements, levels, etc., at the site and adapt work to actual conditions.
- B. Only site measurements may be utilized in calculations. Mechanical and electrical drawings are diagrammatic or schematic.

3.14 REFINISHING AND TOUCHUP PAINTING

- A. Refinish and touch up paint.

1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.15 CLEANING AND PROTECTION

- A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION 260500

SECTION 262816 - DISCONNECT SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes enclosed individually mounted switches and circuit breakers used for the following:
 - 1. Feeder and equipment disconnect switches.
 - 2. Feeder branch-circuit protection.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 26 Section "Wiring Devices" for attachment plugs and receptacles, and snap switches used for disconnect switches.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: For each type of switch, circuit breaker, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes. Include data for overcurrent protective device coordination:
 - 1. Descriptive data and time-current curves.
 - 2. Let-through current curves for overcurrent protective devices with current-limiting characteristics.
 - 3. Coordination charts and tables and related data.
- C. Shop Drawings: For each switch, circuit breaker, and related equipment.
 - 1. Dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices and accessories, equipment features, and ratings. Include the following:
 - a. Enclosure types and details.
 - b. Bus materials, configuration, current, and voltage ratings.
 - c. Short-circuit current rating of switches and circuit breakers.
 - d. Descriptive documentation of options or accessories such as auxiliary devices, controls, interlocks, etc.
 - e. Features, characteristics, ratings, and factory settings of overcurrent protective devices and auxiliary components.
 - f. Fuse product data for fusible devices.
 - 2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.

- D. Field test results indicating and interpreting test results.
- E. Maintenance Data: For switches and circuit breakers to include in operation and maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Contract Closeout," include the following:
 - 1. Routine maintenance requirements for switches, circuit breakers, and all installed components.
 - 2. Manufacturer's written instructions for testing and adjusting switches and overcurrent protective devices.
 - 3. Time-current curves, including selectable ranges for each type of overcurrent protective device.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain switches and circuit breakers from one source and by a single manufacturer.
- B. Comply with NFPA 70 for components and installation.
- C. Listing and Labeling: Provide switches and circuit breakers specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
 - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide switches and circuit breakers by one of the following:
 - 1. Enclosed Disconnect Switches, Enclosed Molded Case Switches, and Enclosed Molded Case Circuit Breakers:
 - a. GE/ABB.
 - b. Siemens Energy & Automation, Inc.
 - c. Square D Co.
 - d. Eaton Corp.; Cutler-Hammer Products.

2.2 ENCLOSURES

- A. Enclosure: NEMA KS 1, Type 1, unless otherwise specified or required to meet environmental conditions of installed location.
 - 1. Outdoor Locations: Type 3R.
 - a. Other Wet or Damp Indoor Locations: Type 4.

2.3 ENCLOSED DISCONNECT SWITCHES

- A. Enclosed, Nonfusible Switch: NEMA KS 1, Type HD Heavy Duty, with lockable handle.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install switches and circuit breakers in locations as indicated, according to manufacturer's written instructions.
- B. Install switches and circuit breakers level and plumb.
- C. Install wiring between switches and circuit breakers, control, accessories, and indication devices.
- D. Connect switches, circuit breakers, and components to wiring system and to ground as indicated and instructed by manufacturer.
 - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values.

3.2 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Basic Electrical Materials and Methods."
- B. Switch and Circuit-Breaker Nameplates: Label each switch and circuit breaker with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

3.3 FIELD QUALITY CONTROL

- A. Testing: After installing switches and circuit breakers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
 - 1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.5 for disconnect switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
- B. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

3.4 ADJUSTING

- A. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

3.5 CLEANING

- A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

END OF SECTION 262816

SECTION 265100 - LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. See 26 05 00 "Basic Electrical Materials and Methods" for electrical materials and methods.

1.2 SUMMARY

- A. This Section includes luminaires, lamps, ballasts, drivers, emergency lighting units, emergency battery packs, emergency lighting inverters, exit signs, luminaire supports, poles, and accessories.

1.3 SUBMITTALS

- A. Product Data: For each luminaire type arranged in order of type designation. Include data on features, accessories, and the following:
 - 1. Physical description including dimensions, construction, and finish.
 - 2. Lamp and ballast data indicating rated life, output, CCT, CRI, and energy use.
 - 3. LED and driver data indicating rated life, output (delivered), CCT, CRI, and energy use.
 - 4. Photometric report including IES files.
 - 5. Emergency lighting units, including batteries and chargers.
- B. Product Data: For each pole type arranged in order of type designation. Include data on features, accessories, and the following:
 - 1. Include data on construction details, profiles, EPA, cable entrances, materials, finishes, dimensions, weight, rated design load, and ultimate strength of individual components.
 - 2. Anchor bolts.
- C. Product Data: For each type and rating of emergency lighting inverter.
 - 1. Include features, performance, electrical ratings, operating characteristics, furnished options, and accessories.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, ventilation requirements, method of field assembly, and components.
 - 3. Include system one-line diagram, internal and interconnecting wiring; and diagrams for power, signal, and control wiring.
- D. Shop Drawings: For non-standard or custom luminaires. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.

- E. Maintenance Data: For luminaires to include in maintenance manuals specified in Division 1.
- F. Samples for Initial Selection: For each luminaire requested by architect or engineer.
 - 1. Include Samples of luminaires and accessories involving color and finish selection.

1.4 QUALITY ASSURANCE

- A. Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- B. Comply with NFPA 70 and 101.
- C. Emergency lighting units, inverters, exit signs, and batteries: Comply with UL 924.
- D. Exterior Lighting: Comply with UL 1598 and listed for wet location.
- E. Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

1.5 COORDINATION

- A. Luminaires, Mounting Hardware, and Trim: Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- B. Coordinate layout and installation of devices with other construction including structural members, underground utilities, above-grade utilities, site design, and building elements.
- C. Coordinate layout and installation of emergency lighting inverters with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels. Label with engraved nameplates.

1.6 WARRANTY

- A. Include labor allowance required for replacement on-site at no extra cost to the Owner within 1-year construction warranty. Transfer remainder of the manufacturer's warranty including ballast manufacturer's labor stipend to owner after 1-year construction warranty.
- B. Ballast and Driver Warranty: 5-year replacement warranty.
- C. Emergency Battery Warranty: 3-year pro-rated warranty.
- D. LED System Warranty: 5-year replacement warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Luminaires and Poles: Subject to compliance with requirements, provide one of the products indicated for each designation in the Luminaire and Site Luminaire Schedules on the drawings.

2.2 LUMINAIRE AND LUMINAIRE COMPONENTS, GENERAL

- A. Metal Parts: Free from burrs, sharp corners, and edges.
- B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit re-lamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during re-lamping and when secured in operating position.
- D. Finishes: Manufacturer's standard, unless otherwise indicated.
 - 1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
 - 2. Metallic Finish: Corrosion resistant.

2.3 LED LIGHT SOURCES

- A. LED Light Source Requirements:
 - 1. Rated life (L70): Minimum 50,000 hours as defined by IES LM80 and TM21.
 - 2. Color Rendering Index (CRI): 80 CRI minimum.
 - 3. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.
- B. LED Driver Requirements:
 - 1. 0-10V Dimming
 - 2. Total Harmonic Distortion Rating: Less than 20 percent.
 - 3. Ambient temperature rating: -40° to +55° C
 - 4. Power Factor (100% output): >0.95
 - 5. Flickering: LED drivers shall conform to IEEE P1789 standards. Alternatively, manufacturers must demonstrate conformance with product literature and testing which demonstrates this performance. Submit % flicker in 1% increments for full range of dimming starting at 500 mA for full output reading. Systems that do not meet IEEE P1789 will not be considered.

2.4 LUMINAIRE SUPPORT COMPONENTS

- A. Comply with Division 26 Section "Basic Electrical Materials and Methods," for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Twin-Stem Hangers: Two, 1/2-inch (12-mm) steel tubes with single canopy arranged to mount a single luminaire. Finish same as luminaire.
- C. Rod Hangers: 3/8-inch minimum diameter, cadmium-plated, threaded steel rod.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Luminaires: Set level, plumb, and square with ceiling and walls. Secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each luminaire.
- C. Align luminaires for optimum directional alignment of light distribution.
- D. Support for luminaires in or on Grid-Type Suspended Ceilings:
 - 1. Utilize grid for support where ceiling system is appropriate rated. Contractor to coordinate luminaire weights with ceiling contractor.
 - 2. At all other locations install a minimum of two ceiling support system rods or wires for each luminaire. Locate not more than 6 inches (150 mm) from luminaire corners.
 - 3. Support Clips: Fasten to luminaires and to ceiling grid members at or near each luminaire corner.
 - 4. Luminaires of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support luminaires independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
- E. Suspended Luminaire Support:
 - 1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
 - 2. Continuous Rows: Suspend from cable installed according to luminaire manufacturer's written instructions and details on Drawings.

3.2 CONNECTIONS

- A. Ground equipment: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values.

3.3 FIELD QUALITY CONTROL

- A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
- B. Malfunctioning Luminaires and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

3.4 CLEANING AND ADJUSTING

- A. Clean luminaires internally and externally after installation. Use methods and materials recommended by manufacturer.

END OF SECTION 265100

LUMINAIRE SCHEDULE										
MARK	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	LIGHT SOURCE		ELECTRICAL		FINISH	MOUNTING	ACCEPTABLE MANUFACTURERS
				SPEC.	CCT	TYPE	LOAD			
1	4' LED STRIPLIGHT	LITHONIA	ZL1D L48 5000LM FST MVOLT 35K 80CRI WH	5,000 LM	3500 K	LED	41 W	120 V	WHITE	SURFACE/CEILING
NOTE 1										
REMARKS										

GENERAL REQUIREMENTS:

A. CONTRACTOR SHALL VERIFY CATALOG NUMBERS AND INSTALLATION REQUIREMENTS PRIOR TO ORDERING. NOTIFY ENGINEER OF ANY CONFLICTS WITH PROPOSED INSTALLATION.

LUMINAIRE SCHEDULE NOTES:

1. LUMINAIRE SHALL BE CONSIDERED EQUAL AS MANUFACTURED BY: ACUTY BRANDS, COOPER, CURRENT, SIGNIFY, CREE LIGHTING.

- GENERAL POWER NOTES**
1. MINIMUM BRANCH CIRCUIT CONDUIT SHALL BE 1/2" MINIMUM DATA/COMMUNICATIONS CONDUIT SHALL BE 1". SEE DRAWINGS FOR AREAS WHERE LARGER CONDUITS ARE REQUIRED.
 2. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT.
 3. PROVIDE A GREEN INSULATED GROUND WIRE IN ALL RECEPTACLE AND EQUIPMENT BRANCH CIRCUITS.
 4. IN EXPOSED STRUCTURE AREAS (NO CEILINGS), ROUTE CONDUIT TIGHT TO DECK. CONDUIT SHALL BE ROUTED PARALLEL OR PERPENDICULAR TO STRUCTURE IN A NEAT AND WORKMANLIKE MANNER AND GROUPED WHERE POSSIBLE. PAINT EXPOSED CONDUIT AND BOXES TO MATCH STRUCTURE IN FINISHED AREAS WITHOUT CEILINGS. EXPOSED WIRING OF ANY TYPE WILL NOT BE ALLOWED.
 5. UNLESS NOTED OTHERWISE, ALL CABLING AND RACEWAY INSTALLED IN EXPOSED OR CONCEALED LOCATIONS NEAR METAL CORRUGATED ROOF DECKING SHALL BE INSTALLED WITH THE REQUIRED CLEARANCE PER NEC SECTION 300.4(E).

- GENERAL ELECTRICAL DEMOLITION NOTES**
1. THE OWNER SHALL HAVE FIRST SALVAGE RIGHTS TO ALL FIXTURES, DEVICES AND EQUIPMENT REMOVED.
 2. WHERE EXISTING CIRCUITS ARE NOT REUSED, REMOVE CONDUCTORS AND ASSOCIATED ACCESSIBLE RACEWAYS BACK TO THE SOURCE. ABANDON CONCEALED CONDUITS IN WALLS WHICH ARE NOT REMOVED.
 3. DEMOLITION DRAWINGS INDICATE FIXTURES, DEVICES AND MAJOR PIECES OF EQUIPMENT WHICH ARE TO BE REMOVED OR RECONNECTED. REMOVE INDICATED ITEMS AND ASSOCIATED ITEMS NOT INDICATED BUT WHICH MUST BE REMOVED TO ACCOMMODATE REMODELING. SEE PROJECT MANUAL, WORK IN EXISTING BUILDING FOR ADDITIONAL INFORMATION.
 4. ALL EXISTING ELECTRICAL DEVICES, FIXTURES, EQUIPMENT, WIRING AND RACEWAYS INCLUDING DATA/COMMUNICATION SYSTEMS SHALL BE REMOVED UNLESS OTHERWISE INDICATED. WHERE EXISTING WALLS ARE TO BE REMOVED ALL ASSOCIATED ELECTRICAL EQUIPMENT SHALL BE REMOVED. DISCONNECT POWER SO THAT DEVICES AND EQUIPMENT MAY BE REMOVED WITH WALLS. SEE ARCHITECTURAL DRAWINGS FOR WALLS TO BE REMOVED. ABANDON CONCEALED CONDUITS WHERE WALLS ARE NOT REMOVED. REUSE CONDUITS WHERE POSSIBLE. DEMOLITION IS NOT INDICATED ON THE ELECTRICAL DRAWINGS. THE CONTRACTOR SHALL VISIT THE SITE AND SHALL BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO THE BID DATE.
 5. SEE ARCHITECTURAL AND MECHANICAL DRAWINGS FOR ADDITIONAL ELECTRICAL DEMOLITION ITEMS. DISCONNECT AND REMOVE ELECTRICAL DEVICES, EQUIPMENT AND ASSOCIATED WIRING AS REQUIRED TO ACCOMMODATE NEW WORK.
 6. POWER TO EXISTING AREAS NOT BEING REMODELED SHALL BE MAINTAINED AT ALL TIMES EXCEPT FOR SHORT TERM OUTAGES NECESSARY FOR RECONNECTION OF EXISTING CIRCUITS. COORDINATE AND SCHEDULE OUTAGES WITH THE OWNER.
 7. SUBSCRIPT 'E' INDICATES AN EXISTING FIXTURE OR DEVICE TO REMAIN. MAINTAIN EXISTING CIRCUITING CONTINUITY UNLESS NOTED OTHERWISE.
 8. SUBSCRIPT 'R' INDICATES AN EXISTING FIXTURE OR DEVICE SCHEDULED FOR RELOCATION. REMOVE EXISTING FIXTURE OR DEVICE AND SALVAGE FOR REUSE. SEE NEW WORK PLANS FOR NEW LOCATION AND RECONNECT AS REQUIRED.
 9. UPDATE ALL PANEL/BOARD DIRECTORIES IMPACTED BY ELECTRICAL WORK.
 10. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING, PAINTING, REPAIRING, AND REPLACEMENT OF ALL EXISTING WALLS, CEILING, FLOORS, OR OTHER BUILDING ELEMENTS WHICH ARE DISTURBED AS PART OF THE DEMOLITION OR INSTALLATION OF NEW ELECTRICAL WORK.

ELECTRICAL SYMBOLS			
SYMBOL		DESCRIPTION	
LIGHTING			
	1	SINGLE POLE SWITCH	
	2	2-WAY SWITCH	
	3	3-WAY SWITCH	
	4	4-WAY SWITCH	
	5	WALL BOX, POWER SWITCH	
	6	CEILING MOUNTED MOTION SENSOR/ SWITCH	
	7	WALL MOUNTED MOTION SENSOR/ SWITCH WITH 10V DIMMING	
	8	LOW VOLTAGE LIGHTING CONTROL SWITCH	
	9	WALL MOUNTED PHOTOCELL	
	10	CEILING MOUNTED PHOTOCELL	
	11	JUNCTION BOX	
FIRE ALARM			
	12	FIRE ALARM SMOKE DETECTOR	
	13	FIRE ALARM HEAT DETECTOR	
	14	FIRE ALARM MANUAL STATION	
	15	CEILING FIRE ALARM STROBE	
	16	CEILING FIRE ALARM HORN & STROBE COMBINATION	
	17	WALL FIRE ALARM STROBE	
	18	CEILING FIRE ALARM HORN & STROBE COMBINATION	
	19	WALL FIRE ALARM SPEAKER & STROBE COMBINATION	
	20	CEILING FIRE ALARM SPEAKER	
	21	WALL FIRE ALARM SPEAKER	
POWER			
	22	CEILING MOUNTED DOUBLE DUPLEX RECEPTACLE	
	23	FLOOR BOX - COMBINATION POWER & DATA	
	24	POKE THRU - COMBINATION POWER & DATA	
	25	FLOOR MOUNTED DUPLEX RECEPTACLE	
	26	MOTOR (TF DENOTES THERMOSTAT/POWER RATING)	
	27	DISCONNECT SWITCH	
	28	TERMINAL BLOCK/ SWITCH	
	29	SWITCH & FUSE	
	30	SWITCH & FUSE	
	31	MAGNETIC MOTOR STARTER	
	32	COMBINATION MAGNETIC STARTER/ DISCONNECT	
	33	MOTOR CONTROL, PUSHBUTTON STATION	
	34	RELAY	
	35	MAL T/O OUTLET ASSEMBLY - LENGTH AS INDICATED	
COMMUNICATION			
	36	INTERCOM CEILING SPEAKER	
	37	INTERCOM WALL SPEAKER	
	38	SOUND REINFORCEMENT WALL SPEAKER	
	39	SOUND REINFORCEMENT CEILING SPEAKER	
	40	WALL MICROPHONE OUTLET	
	41	CEILING MICROPHONE OUTLET	
	42	CALL IN DEVICE	
	43	CALLER CABLE TRAY	
	44	AV/BACK OUTLET	
GENERAL			
	45	WALL MOUNTED JUNCTION BOX	
	46	JUNCTION BOX	
	47	CONDUIT RUN	
	48	CIRCUIT DOWN	
	49	CIRCUIT UP	
	50	CONDUIT FIBER OPTIC	
	51	CIRCUIT BREAK	
	52	BELL	
	53	PUSH BUTTON	
	54	BUZZER	
	55	THERMOSTAT	
	56	MANUFACTURER RECOMMENDED FUSE SIZE	
	57	SUBSCRIPT 'E' ADDED TO ANY SYMBOL INDICATES EXISTING	
	58	SUBSCRIPT 'R' ADDED TO ANY SYMBOL INDICATES RELOCATED	
	59	WHERE (TF) IS USED IN PLANS INDICATES A TYPICAL NOTE OR CONDITION	
	60	SUBSCRIPT 'DN' ADDED TO ANY SYMBOL INDICATES DAMP LOCATION	
	61	SUBSCRIPT 'W' ADDED TO ANY SYMBOL INDICATES WET OPERATED	
	62	SUBSCRIPT 'P' ADDED TO ANY SYMBOL INDICATES PULL OUT LIGHT	

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NOTE: The contractor shall be responsible for obtaining all necessary permits and for ensuring that all work is done in accordance with the applicable codes and standards. The contractor shall also be responsible for ensuring that all work is done in a safe and sound manner and for obtaining all necessary permits and for ensuring that all work is done in accordance with the applicable codes and standards.

morrissey engineering inc.
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MARK	REVISION	DATE
1	Adendum 01	02/02/2024

ELECTRICAL DETAILS

STATE OF NEBRASKA 1526 K BUILDING ELEVATOR
MODERNIZATION



date: 02/02/2024
project number: 23125
designed by: JRH
drawn by: MRC
sheet number:

E3.0