

DIVISION 26

Section 26 00 00.00 20

Bureau of Workers' Compensation
Entry Modification

WORK INCLUDED
BWC-080003-01

SECTION 26 00 00.00 20 – WORK INCLUDED

PART 1 GENERAL

1.01 SCOPE

- A. Furnish all materials, labor, tools, transportation, incidentals and appurtenances to complete in every detail and leave in working order all items of work called for herein and shown on the accompanying Drawings.
- B. It is the intent that the ensuing work shall be complete in every respect and that any material or work not specifically mentioned or shown on the Drawings, but necessary to fully complete the work, shall be furnished.

1.02 COORDINATION OF PLANS AND SPECIFICATIONS

- A. Contact the Associate immediately if there is any question regarding the meaning or intent of either Plans or Specifications, or upon noticing any discrepancies or omissions in either Plans or Specifications.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 SITE VISITATION

- A. The Bidder is required to visit the site and fully inform himself concerning all conditions affecting the scope of the work. Failure to visit the site shall not relieve him from any responsibility in the performance of this Contract.

3.02 SUPERVISION OF WORK

- A. He shall have in charge of the work, at all times during construction, a competent superintendent with a large experience in the work to be done under this Specification.
- B. Refer to the Specifications covering all branches of the work and keep fully informed of the progress of the general construction. Install all work that is concealed and built into the building in place in sufficient time to insure proper location without delays to the work of the other trades. Properly attend the work during the process of building-in to prevent misalignment and damage.

3.03 EXISTING WORK AND DEMOLITION

- A. Locate existing utilities prior to beginning work. Reroute or replace existing utilities where necessary to permit installation of the work. Provide adequate means of protection during work operations. Repair existing utilities damaged during work operations to the Satisfaction of the owner and at Contractor's expense.

- B. Should uncharted or incorrectly charted piping or other utilities be encountered during work operations, notify the Associate immediately for procedure directions.
- C. Suitably and adequately protect the existing work within, and immediately adjacent to, the new work areas from damage and injury during the process of installing the work under this Contract. Existing work that has been harmed, damaged or injured as a result of the Electrical Contractor's operations shall be repaired, restored or replaced at the Electrical Contractor's expense.
- D. Revise existing wiring as indicated or required. Existing work which remains shall be left in first class condition and properly reconnected.
- E. All lighting fixtures, receptacles, switches and exposed conduit in remodeled areas shall be removed and replaced anew as indicated on the Drawings.
- F. Branch circuit wiring from removed fixtures and receptacles shall be removed back to the source.
- G. Reuse existing concealed conduit and flush mounted boxes when possible. All unused boxes shall be blanked-off. All new conduit and wire in remodeled areas shall be run concealed where possible.
- H. Existing utilities have been shown on the Drawings. The information was obtained from the Owner's as-built drawings. The Contractor shall verify the exact location and depth of these utilities and mark on ground. The Contractor shall also contact the Owner before any trenching takes place to obtain approval of marked utility locations.

3.04 CUTTING AND PATCHING

- A. Avoid cutting of concrete, masonry and other work by use of inserts and sleeves, and when necessary shall be done by the Electrical Contractor with such tools and methods as to prevent unnecessary damage to surrounding areas or equipment.
- B. No cutting shall be done which will in any way reduce the structural strength of the building. Should such cutting be found necessary the Associate must first be fully informed of, and consent to, the proposed operation.
- C. All cutting through poured concrete slabs and walls shall be done with core drills. No jack hammers will be allowed.
- D. Patching shall match existing surfaces in kind and finish and shall be done by the Electrical Contractor. This includes patching existing, ceilings and floors where required and patching holes left by removal of existing conduits, equipment, etc. See requirements in this section and in the GENERAL CONDITIONS.
- E. Repair of damages, by this Contractor, to newly patched existing and refinished areas shall be done by the Electrical Contractor in kind to match existing condition.
- F. All conduits, equipment, etc., that penetrates walls or floors shall have openings, sleeves, etc., filled and closed off to prevent the possible spread of fire or products of combustion through the wall or floor.
- I. Where required to maintain fire rating, openings shall be sealed utilizing 3M Brand Fire Barrier Penetration Sealing systems. Fire barrier or fire stop systems from Crouse-Hinds,

Thomas & Betts or Dow Corning may be used at Contractor's option. This includes holes left due to removal of existing conduit, etc. Openings shall be temporarily fire-stopped until permanent fire stopping is done.

3.05 CLEANING AND PAINTING

- A. All electrical equipment shall be kept dry and clean during the construction period. Switchgear, Transformers, etc., shall be covered with fiberglass reinforced plastic sheeting as a minimum form of protection. Provide additional protection, if job conditions so require. If equipment is stored in unheated location, it shall have a method of heating installed to prevent condensation.
- B. Interiors of all enclosures, panels, handholes, manholes and concrete pullboxes, switchgear, transformers, etc. shall be thoroughly vacuumed, cleaned and all dirt and debris removed before installing trim or covers or turning over to Owner. This includes removal of water.
- C. All finished surfaces of equipment furnished under this Contract shall be thoroughly cleaned of dirt and all scratched or damaged surfaces shall be touched up with matching materials before final acceptance of the work. No exposed ferrous metal surfaces shall be left unpainted. Touch-up all galvanized, if scratched, with two coats of aluminum paint.
- D. Prime and paint all steel hangers, boxes, straps, rods, etc. which are not provided with rust-protective finish or the protective finish is damaged in installation. Paint to be zinc chromate primer and aluminum bronze finish. This includes unfinished and mechanical spaces as well as "exposed to view" locations.
- E. When all work is completed and all work has been satisfactorily tested and accepted by the Associate, all fixtures, conduit and other exposed surfaces shall be thoroughly cleaned.
- F. All lamps in all new fixtures or fixtures so designated on the drawings shall be installed new and the entire system shall be checked for satisfactory operation.
- G. Dust must be held to a minimum when work is performed inside of an existing building.

3.06 INTERRUPTION OF SERVICE AND OWNER'S OPERATION

- A. The Electrical Contractor shall organize his work so that these alterations and additions shall cause a minimum of interference and disturbance to the Owner. Arrangements shall be made with the Owner and Associate before interrupting service in any area. A written detailed method of interruption procedure indicating elapsed time required and time of interruption shall be prepared by the Electrical Contractor and submitted to the Associate for approval 10 days before any interruption of service.
- B. All interruptions of service shall be made when the load is at a minimum and shall be scheduled at the Owner's convenience. (Service interruptions will be scheduled for other than normal daytime working hours. The Electrical Contractor shall include necessary cost for overtime labor in all bids.)
- C. At no time shall the Electrical Contractor or his employees normally working on the project leave the facility during a time when any normally live circuits or feeders are disconnected, without permission of the Associate.

Section 26 00 00.00 20

DIVISION 26

WORK INCLUDED
BWC-080003-01

Bureau of Workers' Compensation
Entry Modification

- D. All materials, connections and equipment for temporary control or power wiring to maintain continuity of service during construction shall be provided by the Electrical Contractor. All loads normally supplied from the Electric Utility and those supplied from the Owner's engine generators are included in the above paragraph.

End of Section

DIVISION 26

Bureau of Workers' Compensation
Entry Modification

Section 26 00 00.00 30

CODES AND FEES
BWC-080003-01

SECTION 26 00 00.00 30 – CODES AND FEES

PART 1 GENERAL

1.01 CODES

- A. All work performed under this Specification shall be done in accordance with the latest edition of the National Electrical Code as prepared and published by the National Fire Protection Association, National Electrical Safety Code, Standards of National Bureau of Fire Underwriters and any Federal, State Codes or Local Codes applying.

1.02 PERMITS AND FEES

- A. The owner has obtained the building permit. The contractor shall obtain and pay for all additional permits required by all laws and regulations or public authority having such jurisdiction. File drawings necessary to obtain permits.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

End of Section

DIVISION 26

Bureau of Workers' Compensation
Entry Modification

Section 26 00 00.00 40

GENERAL PROVISIONS
BWC-080003-01

SECTION 26 00 00.00 40 – GENERAL PROVISIONS

PART 1 GENERAL

1.01 REFERENCE

- A. The Drawings, Instructions to Bidders, General and Special Conditions and Division 1 General Requirements apply to work of this division.
- B. All Specifications under this Division title are directed to and are the responsibility of the Electrical Contractor. Unless other trades or persons are specifically mentioned, "Electrical Contractor" is inferred and intended.

1.02 CONTRACT DRAWINGS

- A. The Drawings accompanying these Specifications are complementary each to the other and what is called for by one shall be as if called for by both.
- B. Consult all Contract Drawings which may affect the location of equipment, conduit and wiring and make minor adjustments in location to secure coordination.
- C. Wiring layout is schematic and exact locations shall be determined by structural and other conditions. This shall not be construed to mean that the design of the system may be changed; it refers only to the exact locations of conduit and equipment to fit into the building as constructed and with the coordination of conduit and other equipment with piping and equipment included under other divisions of the Specifications.
- D. Coordinate layout of work with other trades. Make minor adjustments in location required for coordination.
- E. Other than minor adjustments shall be submitted to the Associate for approval before proceeding with the work.
- F. The location of outlets and switches shown on the Drawings is approximate, and the Associate shall have the right to relocate any outlets or switches before they are installed without additional cost.

1.03 MANUFACTURER'S DRAWINGS

- A. Submit to the Associate for review, ten (10) copies of Manufacturer's Drawings for the following items:

<u>ITEMS</u>	<u>TYPE SUBMITTALS REQUIRED</u>
Disconnects	Shop Drawings
Fuses	Catalog Cuts
Conduit Layout(For all conduit installed)	Shop Drawings

- B. Thoroughly review each submittal and indicate the exact item to be furnished. Each submittal shall be stamped with the Contractor's approval before submitting to the Associate.
- C. Engineer's review of Manufacturer's Drawings or Schedules shall not relieve the Contractor from responsibility for errors or omissions in Manufacturer's Drawings or Schedules and deviation from Engineer's Drawings or Specifications.
- D. At the completion of the Job, before final payment is made, the Contractor shall submit six (6) copies of Manufacturer's "As-Built" Drawings. Included with the Drawings shall be The Operating and Maintenance Manuals as called for in Section 26 00 00.00 50.

1.04 JOB-SITE COPY OF DOCUMENTS

- A. Maintain at the site, one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other modifications, in good order. The Drawings shall be marked to record all changes made during construction especially deviations made necessary to incorporate equipment different from base equipment specified. These shall be available to the Associate. The Drawings marked to record all changes made during construction shall be delivered to the Associate for the Owner upon completion of the work. An additional set of Drawings will be furnished by the Associate for this purpose upon request.

PART 2 PRODUCTS

2.01 MATERIALS

- A. All materials shall be new and undeteriorated and of a quality not less than the minimum specified.
- B. Materials and equipment for which there are Underwriters' Laboratories Standard requirements, listing and labels, shall have listing of Underwriters' Laboratories and be so labeled.

2.02 SUBSTITUTIONS

- A. It is the intent of this article to make the Specification open in every respect to all available brands of material of equal quality during the period of bidding.
- B. Bid shall be based on furnishing one of the brands of material and equipment mentioned in the Specifications. Submit, attached to the Bid, selected list of all material and equipment brands intended to be furnished if awarded the Contract. No change of brands shall be made after receipt of Bid and attached material brands list, unless approved in writing by the Associate.
- C. Refer to "Instructions to Bidders" regarding substitutions.
- D. Where the Contractor furnishes equipment or material specified as equal, he is responsible for all modifications required for his work, and work of all other trades to install the equipment and insure performance as originally specified.

2.03 GUARANTEES

- A. The Electrical Contractor shall be responsible for all defects, repairs and replacements in materials and workmanship for a period of one (1) year after contract completion.

- B. Product guarantees greater than one (1) year shall be passed along to the Owner for full benefit of the manufacturer's warranty.

2.04 QUANTITIES

- A. Items may be referred to as singular or plural on the Drawings and in the Specifications. The Contractor is responsible for determining quantity of each item required.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Furnish and install all necessary hangers, supports, straps, boxes, fittings and other similar appurtenances not indicated on the Drawings but which are required for a complete and properly installed system consistent with the Architectural treatment of the building.
- B. Contractor shall inform himself fully regarding peculiarities and limitations of space available for installation of materials and apparatus under this contract, and see that all equipment necessary to be reached from time to time for operation and maintenance are made easily accessible. Clearances, when possible, shall be greater than those required by code.
- C. Working Clearances: At least 6'-6" clear headroom must be maintained in front of all electrical equipment. Provide at least 6' for 13.2 KV, 3'-6" for 480/277 volt and 3'-0" for 208/120 volt clear space in front of all electrical equipment as wide as the equipment with a minimum of 2'-6" width. The same clearance shall be required at the rear of rear access equipment.

3.02 WORKMANSHIP

- A. Electrical work shall meet or exceed the standards of installation and workmanship set forth in the latest edition of the National Electrical Contractors Association publication entitled NECA Standard of Installation, except as otherwise modified in these specifications or shown on the Drawings.
- B. The Associate or Owner reserves the right to direct the removal and replacement of any item which, in his opinion, does not present an orderly, neat or workmanlike appearance, provided that such item can be properly installed in an orderly way by methods usual in such work, or which does not comply with the contract drawings or these specifications. Perform such removals or replacements when directed in writing by the Associate and at the Contractor's expense.
- C. The Electrical Contractor, insofar as the work is concerned, shall at all times keep the premises in a neat and orderly condition, and at the completion of the work shall properly clean up and cart away debris and excess materials.

End of Section

SECTION 26 00 00.00 50 – OPERATION AND MAINTENANCE MANUALS

PART 1 GENERAL

1.01 OPERATION AND MAINTENANCE MANUALS

- A. Submit three (3) bound copies of operation and maintenance manuals, 8- 1/2 in. by 11 in. in 3-ring hardback binder. 23 in. X 25 in. and larger sheets shall be folded and indexed in rear of binder.
- B. Format:
 - 1) Title page: Title of Project, Owner, Address, Date of Submittals, Name and Address of Contractor, Name of Associate.
 - 2) Second page: Index of Manual Contents.
 - 3) First Section: A copy of each approved shop drawing and submittal with an index at the beginning of the section.
 - 4) Second Section: A list (same as submittal drawings) of all equipment used on the project, together with suppliers name and address.
 - 5) Third Section: Operating and Maintenance Instructions for all lighting control, switchgear, pad mounted switchgear, pad mounted distribution transformers. Manufacturer's maintenance manuals for equipment furnished under this Contract shall include such items as parts lists, detailed lubrication instructions, procedures for performing normal maintenance functions, preliminary trouble shooting procedures and wiring diagrams.
 - 6) Brief but complete instructions for start-up, shut- down and routine maintenance of each system.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

3.01 OWNER PERSONNEL INSTRUCTION

- A. After placing systems in operation, thoroughly instruct designated Owner's personnel on operation and maintenance of all equipment and systems.
- B. Provide a minimum of sixteen (16) hours total instruction. Instructions shall include the following:
 - 1) Location of equipment and explanation of function.
 - 2) Refer to operating instruction manual for record and clarity.
 - 3) Coordination of written and verbal instructions so that each is understood by personnel.

- C. The Electrical Contractor shall be responsible for arranging for the instruction and supervision at a time convenient to the Owner or his representative and for notifying the Owner of the time at least 7 days in advance.
End of Section

DIVISION 26

Bureau of Workers' Compensation
Entry Modification

Section 26 00 00.00 60

IDENTIFICATION
BWC-080003-01

SECTION 26 00 00.00 60 – IDENTIFICATION

PART 1 GENERAL

1.01 SCOPE

- A. Each piece of service equipment and individual switches and all pull boxes shall be identified on the front cover or trim with its name and/or designation number or letter as shown on the Drawings and with the voltage available within the panel.

PART 2 PRODUCTS

2.01 GENERAL

- A. Identification shall be in the form of laminated plastic nameplates, black face, with the letters engraved into the white background, minimum 1/4" high. Plates shall be drilled on each end for sheet metal screw attachment. No "Dymo" or similar tape type labels will be allowed.
- B. The following is an example of the nameplate layout and wording.

Elevator No. 1
480V-3Ø, 3W, 100A

PART 3 EXECUTION

3.01 INSTALLATION

- A. Plastic nameplates shall be attached to face of electrical device by sheet metal screws. Locate plate so wording reads horizontally and plate does not obstruct other identification plates, latches or operators.

End of Section

DIVISION 26

Bureau of Workers' Compensation
Entry Modification

Section 26 00 00.00 70

BOXES AND PLATES
BWC-080003-01

SECTION 26 00 00.00 70 – BOXES AND PLATES

PART 1 GENERAL

1.01 SCOPE

- A. Furnish and install all outlet, junction, and pullboxes as indicated on the Drawings and as necessary to install the required conduit and wiring in a neat and workmanlike manner.
- B. Furnish and install all outlet and junction box covers and wiring device plates.

PART 2 PRODUCTS

2.01 STANDARDS

- A. Pullboxes and junction boxes shall be in accordance with Code requirements and shall be Underwriters' Laboratories labeled.

2.02 BOXES FOR FLUSH WORK

- A. Flush outlet, junction and pullboxes shall be pressed steel galvanized or sherardized and shall be a minimum of 4" square or octagonal similar to Appleton #40. Steel boxes cast in concrete shall be designed for concrete installation.
- B. Flush wall boxes in tile, marble, brick, or other finished masonry walls shall be Steel City GW-135-C Series, or Raco 695 Series.

2.03 BOXES FOR EXTERIOR WORK

- A. Boxes at exterior areas to be watertight and dust-tight with gasketed covers.

2.04 BOXES FOR EXPOSED WORK

- A. All boxes for exposed work in finished or unfinished spaces shall be "FS" type with threaded hubs with rigid conduit riser (deep wiremold boxes).

2.05 MULTIPLE GANG

- A. Multiple gang switch boxes for 277 volt circuits shall have steel partitions between gangs.

2.06 PLATES AND COVERS

- A. Switch plates on flush and cast boxes shall be Sierra Nos. S-1N, S-2N, S-3N etc., as required, and shall be made of satin finish #302 stainless steel.
- B. Duplex receptacle plates on flush and cast boxes shall be Sierra No. S-8N satin finish #302 stainless steel.
- C. Telephone outlet plates shall be Sierra Satin finish #302 stainless steel with rubber grommets of size recommended by the Telephone Company.

- D. Special or engraved plates, as indicated on the Drawings, shall be Sierra #302 satin stainless steel for the application required. Letters shall be 3/16", engraved with black enamel fill.
- E. Blank outlets where required in finished areas shall match wiring device covers in that area.
- F. Plates of satin finish #302 stainless steel as manufactured by Slater or Pass and Seymour, may be furnished at this Contractors option

PART 3 EXECUTION

3.01 INSTALLATION

- A. All boxes shall be rigidly supported from building structure independent of the conduit system. Boxes cast into masonry or concrete are considered to be rigidly supported.
- B. Close all unused and open knockouts with plugs of the proper size.

End of Section

SECTION 26 00 00.00 80 – WIRING DEVICES

PART 1 GENERAL

1.01 SCOPE

- A. Furnish and install all wiring devices where shown on the Drawings.
- B. Wiring devices shall be furnished in strict accordance with the catalogue numbers and manufacturers listed in the Schedule which follows. Other special purpose devices shall be as specified on the Drawings.

PART 2 PRODUCTS

2.01 STANDARDS

- A. Duplex Grounding Type Receptacle - 20 amp, 125 volt - NEMA 5-20R
Hubbell - 5352-I
Arrow Hart - 5352-I
- B. Single pole Switches - 20 amp, 120/277 volt
Hubbell - 1221-I
Arrow Hart - 1991-I
- C. 3-Way Switches - 20 amp, 120/277 volt
Hubbell - 1223-I
- D. 4-Way Switches - 20 amp, 120/277 volt
Hubbell - 1224-I
Arrow Hart - 1994-I
- E. Switch and Pilot Light Assemblies - 20 Amp
Hubbell - 1221 PL for 120 volts
Hubbell - 1221-PL7 for 277 volts
Arrow Hart - 2999-R for 120 volts
Arrow Hart - 2999-R-277 for 277 volts
- F. Weatherproof Receptacles - 20 Amp, 125 Volt - NEMA 5-20R
Hubbell - 5352 with Reddot, NEMA 3R cover
Arrow Hart - 5352 with Reddot, NEMA 3R cover
Cover shall be water proof when in use.
- G. G.F.I. Receptacle - 20 Amp, 125 Volt - NEMA 5-20R

Hubbell - GF 5362-I

H. Wall Box Dimmers

- 1) Incandescent wall box dimmers shall be Hunt electronic dimmers for 120 volt operation. See Drawings for wattage and quantities.
- 2) The Electrical Contractor may, at his option, furnish P & S dimmers.

2.02 EQUIVALENT MANUFACTURERS

- A. The Electrical Contractor may at his option furnish equal devices by P & S, Leviton, or Woodhead.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install wiring devices in a neat and workmanlike manner.
- B. Ground all receptacles in accordance with Article 250-74 of NEC and as indicated in the Grounding Section of this Specification.
- C. To eliminate noise pass thru, no outlets or devices shall be mounted back to back.
- D. Wiring devices specified are side and back wired type and shall be back wired.

End of Section

DIVISION 26

Bureau of Workers' Compensation
Entry Modification

Section 26 05 19.00 10

WIRE AND CABLE (600V AND BELOW)
BWC-080003-01

SECTION 26 05 19.00 10 – WIRE AND CABLE (600V AND BELOW)

PART 1 GENERAL

1.01 SCOPE

- A. Furnish and install all wiring required to connect complete power, lighting, grounding, control, and auxiliary systems.

PART 2 PRODUCTS

2.01 STANDARDS

- A. All conductors shall be stranded and of the AWG size and type shown on the Drawings. Where no size or type is shown, conductors shall not be less than #12 type XHHW, THHN, or THWN. All conductors shall be copper and have 600 volt insulation; be UL labeled.
- B. All conductors shall be stranded unless otherwise noted and conform to the latest edition of the Underwriters' Laboratories, Inc., "Standard for Rubber Covered Wires and Cables" and the National Electrical Code.
- C. No wire used for lighting or power shall be smaller than #12 AWG.
- D. No wire used for control circuits shall be smaller than #14 AWG.

PART 3 EXECUTION

3.01 INSTALLATION

- A. All conductors shall be continuous from box-to-box. No joints shall be permitted in the circuit other than in junction boxes or fixtures.
- B. All make up connections to fluorescent lighting fixtures and all branch circuit conductors run in wiring channels of fluorescent lighting fixtures shall be THHN, THHW, or XHHW rated 90°C.
- C. Equipment ground conductors shall be same insulation type as the associated circuit conductors.
- D. All conductors of a circuit shall follow the same path through any openings in metal partitions within enclosure.
- E. The ampacity of all conductors shall be at least as great as the rating of the fuse or circuit breaker on the line side of the conductors. Note the ampacity reduction required by Code when more than three conductors are placed in a raceway.
 1. All conductors for distribution and control equipment terminations shall be based on full 75°C ampacity.

2. All conductors for appliance and utilization equipment terminations rated 100 amperes or less shall be based on 60°C ampacity.
- F. Provide cable supports for vertical raceways per NEC Table 300-19 (a).
- G. Wiring installed in separate conduits.
 1. All emergency and exit lighting.
 2. Control wiring.
 3. Auxiliary systems wiring.
- H. Swab conduits free of moisture, dirt and grease before pulling wire. Care shall be exercised while installing wire in conduits so that conductor insulation will not be injured. No oils, grease or compounds other than Ideal "Wire Lube", "Yellow 77", or equal UL approved wire pulling lubricants shall be used for pulling in any conductors.
- I. Remove all wire cut dead.

3.02 CONNECTIONS

- A. All connections are to be made using pressure type terminals.
- B. Where connections are to be made to devices or equipment under screw heads only, install insulated, crimp type spade clips on the wire ends before the connections are made.
- C. Devices shall not be used as through connection points. Where through circuits are involved they shall be spliced in the box and a pigtail connected to the device.
- D. Connectors shall contain only one wire unless they are listed for multiple conductors.
- E. Joints in #10 and smaller wire shall be made using the following types of connectors: Minnesota Mining and Manufacturing "Scotch Lok", Ideal Industries, Inc. "Wing Nut", or Thomas and Betts Co. Type "PT". Connectors shall be used only within their range. Other threaded-on types of insulated connectors shall not be used.
- F. Joints in #8 and larger wire or joints in any wires above the range of threaded-on connectors shall be made using pressure type mechanical connectors applied after wires are cleaned and then insulated using two (2) layers of "Scotchfil" brand electrical insulation putty and covered by two (2) half-lapped layers of "Scotch 88", or Plymouth Slipnot Gray vinyl plastic electrical tape. Connectors can be installed and sealed against moisture by installing Raychem "TCS (indoor) or WCSM (exterior)" sealant coated heat shrink tubing.
- G. Splices in all conductors in hand hole, manhole or vaults shall be made using a 3M underground splice kit #85 Series scotch cast multi-mold resin splicing kits. Connector shall be a Burndy Type YGHC HYTAP copper compression tap connector.

DIVISION 26

Section 26 05 19.00 10

Bureau of Workers' Compensation
Entry Modification

WIRE AND CABLE (600V AND BELOW)
BWC-080003-01

3.03 WIRE COLOR CODE

A. The following color code shall be used:

	<u>120/208 Volt</u>	<u>277/480 Volt</u>
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Equipment Ground	Green	Green

All control circuits shall be pink. On 3- and 4-way switches, the travelers shall be the same color as the phase used.

B. Conductors No. 10 AWG or smaller shall have insulation colored as noted above.

C. Conductors No. 8 AWG or larger shall have insulation colored as noted above or colored tape, minimum size 1/2", wrapped twice around at the following points:

- 1) At each terminal
- 2) At each conduit entrance
- 3) At intervals not more than 12 inches apart in all boxes, panel tubs, switchboards, etc.

D. Equipment grounding conductors No. 8 AWG and larger shall be green or green tape applied in a continuous wrap where visible at panels and junction boxes, etc.

3.04 MARKING

A. All branch circuits shall be marked in the panelboard gutters. Markers shall indicate corresponding branch-circuit numbers.

B. All signal and control wires shall be marked at all termination points, such as cabinets, terminal boxes, equipment racks, control panels, consoles, etc.

C. The wire markers shall be Thomas and Betts vinyl tape type WM wrapped once around the wire and the adhesive sides placed together to form a flag.

D. These wire markers shall be installed when wire is pulled.

3.05 EXIT AND EMERGENCY WIRING

A. All exit and emergency wiring shall be as shown on the Drawings and shall be run in a separate conduit from any other conduit. Branch circuit wiring shall be #10 THW minimum.

B. Wire insulation shall be color coded the same as the respective voltage building wiring, and be identified with 1/2" wide red tape wrapped twice around at not more than 12" intervals at all access points. On conductors #8 AWG and larger with black insulation, red tape will be used in addition to other identification tape.

End of Section

DIVISION 26

Section 26 05 73.00 40

Bureau of Workers' Compensation
Entry Modification

FUSES
BWC-080003-01

SECTION 26 05 73.00 40 – FUSES

PART 1 GENERAL

1.01 SCOPE

- A. Provisions of this Section shall apply to all fuses and fused equipment of 600 volts or less as shown on the Drawings.
- B. Furnish and install all fuses as described below.

PART 2 PRODUCTS

2.01 STANDARDS

- A. All fuses above 600 amperes shall be UL Class L, Bussman "Hi-Cap" Type KRP-C.
- B. All fuses 600 amperes and below shall be UL Class RK-1, Bussmann "Lo- Peak" Type LPN/S-RK, or Littlefuse Type LLN/S-RK, unless otherwise noted.

PART 3 EXECUTION

3.01 SPARE FUSES

- A. Furnish one set of three spare fuses for each size and type of fuse used and turn over to the Owner.

3.02 VOLTAGE RATING

- A. All fuses shall have proper voltage rating for the system voltage in which they are used.

End of Section

SECTION 26 08 00 – TESTS AND INSPECTIONS

PART 1 GENERAL

1.01 INSPECTIONS

- A. Obtain all inspections required by all laws, ordinances, rules, regulations or public authority having jurisdiction and obtain certificates of such inspections and submit same to the Associate. Pay all fees, charges and other expenses in connection therein.
- B. Before any electrical work is covered, the Associate will inspect the electrical work completed at that time.
- C. Final Inspection - When the Contractor determines all work is completed and working properly per the Contract Documents, he shall request a "Final" inspection by the Associate in writing. If more than one re-inspection is required after this final inspection, the Contractor shall bear all additional costs, including compensation for the Associate additional services made necessary thereby. A final inspection will not be made until Operating and Maintenance Manuals and Test Reports are submitted and approved and all prior "Observation report" punch lists are completed, signed and returned to the Associate.
- D. All work shall be inspected by the Department of Commerce, 6606 Tussing Road, Reynoldsburg, Ohio and upon completion of the work, the Electrical Contractor shall furnish to the Office of the State Architect, a certificate of inspection and approval from said Department before final payment on the Contract will be allowed. Fee for inspections shall be a part of this Contract.

1.02 OBSERVATION REPORTS

- A. During the course of construction, the Associate will prepare "Observation Reports" with a list of items found to be in need of correction. All items listed shall be corrected by the Contractor. A space is provided on the form for the Contractor to note the completion of each item. All prior "Observation Report" items must be completed, the lists signed and returned to the Associate prior to making the final inspection. After the final list is issued, the same procedure will apply.

1.03 TESTS

- A. When the Associate makes final inspection of all electrical work he will order tests performed as deemed necessary. These tests may include operation of lights and equipment, continuity of conduit system, grounding resistance's and insulation resistance's and checking out the operation of the various systems. This Contractor shall provide such assistance as required (including manpower and tools) to start and stop the various systems, etc. and simulate control sequences. The Contractor (not the Associate) is responsible to turn on the systems and demonstrate they are operating properly.
- B. Submit data taken during such test to Associate. Pay all professional engineering fees involved in required testing of equipment.

- C. If the Associate determines that any work requires special inspection, testing, or approval which Part 3 - Execution does not include, he will, upon written authorization from the Owner, instruct the Contractor to order such special inspection, testing or approval. The Contractor shall give timely notice so the Associate may observe the inspections, tests or approvals. If such special inspection or testing reveals a failure of the work to comply with the requirements of the Contract Documents, the Contractor shall bear all costs thereof, including compensation for the Associate additional services made necessary by such failure; otherwise the Owner shall bear such costs, and an appropriate Change Order shall be issued.

1.04 UNACCEPTABLE WORK

- A. Work shall be unacceptable when found to be defective or contrary to the Plans, Specifications, Codes specified or accepted standards of good workmanship.
- B. The Contractor shall promptly correct all work found unacceptable by the Associate whether observed before or after contract completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such unacceptable work, including compensation for the Associate additional services made necessary thereby.

1.05 GUARANTEE

- A. This Contractor is responsible for all defects, repairs and replacements in materials and workmanship, for a period of one (1) year after final payment is approved by the Associate.

PART 2 PRODUCTS

Not Applicable.

PART 3 EXECUTION

3.01 PERFORMANCE

- A. Contractor, subcontractor, vendors, or manufacturer shall provide tests on the following equipment. Refer to the appropriate specification section for description of the tests.

Transformers
Primary Cable

3.02 LIGHTING

- A. All lamps in all fixtures shall be installed new and the entire system shall be checked for satisfactory operation.

3.03 PHASE ROTATION

- A. Prove that the switchgear, panelboards, etc., are connected for clockwise (A-B-C) rotation as marked by the manufacturer.
- B. Prove that all electrical equipment is connected for clockwise rotation (A-B-C).

3.04 LOAD BALANCE

DIVISION 26

Bureau of Workers' Compensation
Entry Modification

Section 26 08 00

TESTS AND INSPECTIONS
BWC-080003-01

- A. Prove that loads are balanced across all phases of panelboards.
- B. Upon completion of electrical work, test the full load lighting and appliance phase balance of the service and distribution feeders. Tests to be witnessed by the Associate or Owner's representative, and results recorded and reported in writing.
- C. Obtain optimum phase balance under full load condition by reconnection of panelboard feeders at the main switchboard. Any panelboards requiring circuit changes for balance shall reflect these changes in the panel directory and wire color identification. Color change can be made with colored tape at panel.
- D. Pay special attention to prevent reverse rotation of motors during load balance and adjustments.

3.05 NEUTRAL-GROUND SEPARATION

- A. Prove that the neutral and ground are separated, except as required by the National Electrical Code, at service entrance and transformer secondaries.

3.06 GROUND FAULT

- A. The ground fault systems shall be performance tested, on site, upon complete installation. The test shall be in accordance with instruction provided with the equipment. A written record of the test shall be submitted to the Associate.

3.07 RESISTANCE AND CONTINUITY

- A. Provide insulation resistance, grounding resistance, and ground continuity tests of feeders, branch circuits lightning protection system or equipment on demand.

3.08 CONNECTIONS

- A. All switchboard bus joints shall be bolted with a torque wrench and checked by the Owner's Representative.
- B. Prove that mechanical connections are torqued to manufacturer's recommended UL and NEMA standards on demand.

3.09 CONTROL AND INTERLOCKING

- A. Prove that motors and equipment operate as indicated in control and wiring diagrams and sequence of operation.
- B. Prove that lighting, switchboard and miscellaneous controls operate as indicated in control and wiring diagrams and sequence of operation.

3.10 EQUIPMENT

- A. Provide necessary electrical personnel and testing instruments as required to assist in testing of installation.

End of Section

