SECTION 26 00 10 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes general administrative and procedural requirements for electrical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 1:

1. Submittals.
2. Coordination Drawings.
3. Record documents.
4. Maintenance manuals.
5. Rough-ins.
6. Electrical installations.
7. Cutting and patching.

1.2 SUBMITTALS

A. Follow the procedures specified in Division 1.

B. Submittals must be provided with all catalog information clearly identified indicating all options to be provided as part of the product. Any submittal not containing this information will be rejected.

C. Provide the following shop drawings in booklet form:

1. Light fixtures cuts shall be submitted all at one (1) time in a single packet.
2. Electrical switchgear, including, but not limited to panelboards, transformers, disconnect switches, manual motor starters, combination motor starters / disconnect switches, and contactors shall be submitted all at one (1) time in a single packet. All equipment shall be of one manufacturer.
3. Wire devices shall be submitted all at one (1) time in a single packet and be from one (1) manufacturer.
4. Occupancy sensors shall be submitted all at one (1) time in a single packet and be from one (1) manufacturer whether connected to a lighting control system or provided with power packs, unless noted otherwise. Layout drawings may be submitted after the devices are approved.
5. **All required layout drawings shall be shown on architectural backgrounds and not the electrical drawings to ensure that the manufacturer locates all devices. It is the contractor's responsibility to acquire the CAD drawings per Division 1 requirements.**

1.3 PRODUCT REVIEWS AND SUBSTITUTIONS

A. Refer to Division 1 for substitutions requirements under this contract. Division 1 requirements supersede requirements listed elsewhere.

1.4 SHOP DRAWINGS

A. Refer to the Conditions of the Contract (General and Supplementary) and Division-1 for submittal definitions, requirements, and procedures.

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B. Where submittals include multiple items, a bill of material (not including quantity) shall be provided at the front of the shop drawing. The bill of material shall include product identification, manufacturer and model number.

C. Submittal of Shop Drawings, Product Data, and Samples will be reviewed only when submitted by the Prime Contractor. Submittals from sub-Contractors and material suppliers directly to the Architect/Engineer will not be reviewed. No equipment/materials shall be installed until the Shop Drawings have been stamped with "No Exceptions Taken" or "Make Corrections Noted" by the Architect/Engineer.

D. Submit Shop Drawings as listed in each specification section. Following is a list of shop drawings to assist the contractor; however, the contractor shall supply all shop drawings as listed in each individual section whether listed below or not.

1. Coordination Drawings.
2. Short-Circuit, Coordination and Arc-Flash Hazard Studies
3. Aluminum/Copper Compression Lugs.
4. Medium Voltage (15 KV) Cables and Terminations.
5. Medium Voltage Cable/Termination Tests.
6. 15 KV Switchgear.
7. Secondary Distribution Board.
8. Power and Lighting Panelboards.
9. Dry Type Transformers.
10. Mini Power- Zone Transformers.
11. Disconnect Switches.
12. Individually-Mounted Circuit Breakers.
13. Combination Motor Starter/Disconnect Switches.
14. Elevator Power Module Switch.
15. Fuses.
16. Contactors.
17. Thermal Overload Switches.
18. Wiring Devices and Wall Plates.
19. Flush Floor Outlets / Boxes and/or poke-thrus.
20. Surface Raceway.
21. Dimmer Switches.
22. All Lighting Fixtures (submit in booklet form and with detail drawings where required).
23. Stage Lighting Equipment.
24. Low Voltage Lighting Control Equipment and associated wiring diagrams and layout drawings.
25. Occupancy Sensors and associated layout drawings.
26. Emergency Generator and Emergency Lighting Equipment.
27. Automatic and Manual Transfer Switches.
28. Transient Voltage Surge Suppression.
29. Fire Alarm Equipment and associated wiring diagrams, and layout drawings.
30. Data Equipment including, but not limited to equipment shop drawings, warranty information, Installer information, testing information and layout drawings.
31. Cable Tray and associated layout drawings.
32. Intercommunication, Time Signal, and Sound System Equipment with associated wiring diagrams and layout drawings.
33. Remote Sound and A/V Systems.
34. Classroom A/V equipment.
35. Access Control Equipment and associated wiring diagrams and layout drawings.
36. Fire Stopping Material.
37. Access Panels.

E. When preparing submittals and any required final programming, use a room number schedule generated by the architect and/or the owner, which indicates the actual room numbers that will be used when the

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building is occupied. If the schedule is not available, revise the initial submittal, when a schedule is available, to reflect the proper room numbers.

F. Submittal Plans: Submittal plans **MUST** be provided with only the system being presented. Plans not submitted that have not been cleaned of extraneous systems (i.e. a low voltage system being installed on the power drawing, showing all the power and other low voltage systems), will be grounds for immediate rejection without review.

1.5 COORDINATION SUBMITTALS

A. The Contractor shall coordinate with other trades, and provide building coordination drawings for all major components. Following is a MINIMUM list of components that must be included on the coordination drawings; however, the Contractor must also include all other components and systems of substantial size to ensure proper coordination.

1. Conduit pathways, denoting pathways for larger conduits (3” and larger) as well as bundles of MC cable.
2. Cable tray.
3. Switchgear (unit substations, switchboards, motor control centers, panelboards, transformers, large disconnect switches (200A and larger).
4. Plug-in busway and feeder busway.
5. Rooftop solar inverter.
6. Generator set (if inside) and associated transfer equipment.
7. Static uninterruptible power supply.
8. Transient voltage surge suppression equipment.
9. Lighting.
10. Theatrical lighting and control system.
11. Intercommunications cabinet.
12. Remote sound reinforcement cabinet and speakers.

1.6 PRODUCT OBSOLESCENCE

A. In all cases, the most current iteration of the specified product shall be submitted. Where the specified product is no longer manufactured, the contractor shall submit an equivalent product with the same or better specifications. Where specific manufacturers are specified, the contractor shall supply from the same manufacturer the recommended replacement; however, under no circumstances shall the replacement product be deficient in any aspect to the specified product.

B. In the submittal for the product, the Contractor shall provide a signed letter clearly indicating the reason for the replacement product, and confirmation that the replacement product meets or exceeds all of the specified product's specifications to the best of the Contractor's knowledge.

C. The replacement product shall be provided at no additional cost to the owner, and shall not constitute any extension to the project schedule.

D. These requirements shall be inclusive to requirements listed elsewhere in the specifications, and shall not void any other requirements.

1.7 INSPECTIONS

A. The Contractor shall provide certificates of approval, in triplicate, for service equipment, building rough wiring, and building finished wiring.

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B. Inspection certificates shall be submitted to the Engineer within 30 days after the inspections are made. Contractor shall use an independent NEC Certified Inspection Agency as the approved agency. Contractor must verify that the Certified Inspection Agency is approved by the local municipality and the Owner to inspect electrical installations in the project locality. All inspection certificates must be received before final payment can be made.

C. Refer to General Conditions for additional information.

1.8 INDEPENDENT COMMISSIONING

A. Independent Commissioning of electrical systems meeting local and state codes, and owner requirements shall be provided as part of this project. The independent commissioning authority may be hired by this Contractor, another project Contractor or the Owner, as indicated in the documents. However, this does not absolve the installing Contractor and manufacturer from ensuring full functionality of the systems, and manufacturer commissioning as outlined in the individual sections.

B. The Contractor shall schedule and coordinate shop drawing submissions, systems installation and systems start-up with the commissioning authority as required to allow the commissioning authority to perform their work.

C. Commissioning of the lighting control system shall take place on every project, and shall meet the local currently adopted version of the International Energy Conservation Code. This Contractor shall ensure this takes place, and contract with the applicable party as required.

1.9 MANUFACTURER'S REQUIREMENTS

A. All material shall be new, of the best respective kinds, manufactured by the company or companies mentioned and shall be of domestic manufacture unless specified otherwise.

B. All equipment, material or apparatus of any one system must be the product of one Manufacturer, or system tested products.

C. Manufacturers not listed in the Contract Documents must submit to the Engineer, via a Bidding Contractor, all product information per Division 1 requirements.

1.10 NAMEPLATE DATA

A. Each item of power operated equipment shall be provided with a permanent operational data nameplate on indicating Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliance, and similar essential data. Nameplates shall be located in an accessible location.

1.11 FAMILIARITY WITH PROPOSED WORK

A. All Contracts are with the understanding that the Contractor, prior to submission of his bid, acquainted himself with the requirements of the Drawings and Specifications, including "Conditions of the Contract," conditions of the site, its terrain, soil conditions, all other requirements of the Contract, and that he obtained all information necessary for completion of the work on or before the date specified for receiving of bids.

B. In all cases where a device or part of the equipment is herein referred to in the singular, such reference shall apply to as many such items as are required to complete the installation.

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C. "Existing" information does not necessarily represent "as-built" conditions. The Contractor shall verify all existing conditions. If discrepancies are found the Contractor shall notify the Architect/Engineer for a resolution before proceeding.

1.12 DEFINITIONS

A. The terms "The Contractor" or "This Contractor" mentioned in these Specifications refers to the Electrical Contractor responsible for the work and equipment included in these Specifications.

B. The term Sub-Contractor refers to any reference to, or letting of work contained in these Specifications to any Sub-Contractor or Manufacturer by the Prime Contractor. This does not relieve the Prime Contractor of his responsibility for all work, material and equipment in this Specification.

C. The term "Provide," when used separately, shall mean to "Furnish and Install."

D. The term "Furnish," when used separately, shall mean to obtain and deliver on the job for installation by other trades.

E. The term "Install," when used separately, shall mean to mount in place, connect and make operable.

1.13 INTENT OF THE DRAWINGS AND SPECIFICATIONS

A. The Drawings which accompany the Specifications are for the purposes of illustrating the character and extent of the work, and are subject to such modifications by Architect/Engineer as may be found either necessary or advisable before ordering the prosecution of the work. The Contractor shall conform to and abide by whatever Supplementary Drawings and explanations which may be furnished by the Architect/Engineer for the purpose of illustrating the work. The Architect/Engineer shall decide as to the meaning or intention of any portion of the Specifications and Drawings.

B. Where the work is shown in complete detail on only half or a portion of a Drawing, or there is an indication of continuation, the remainder being shown in outline, the work drawn out in detail shall be understood to apply to other like portions of the structure. All work that may be called for in the Specifications and not shown on the Drawings, or shown on the Drawings and not called for in the Specifications, shall be executed and furnished by the Contractor as described in both.

C. Should any incidental work or materials be required, but not set forth in the Specifications or Drawings, either directly or indirectly, but which is necessary to fulfill the intent thereof, the Contractor is to understand same to be implied and required, and he shall perform all such work and furnish all such materials as fully as if they were particularly delineated or described, without additional cost to Owner. This shall include all materials, devices, methods peculiar to the machinery, equipment, apparatus, or systems as described herein.

1.14 EQUIPMENT ENCLOSURE RATINGS

A. Electrical equipment installed within the building shall carry a NEMA rating 1 or higher if indicated in the specifications or on the drawings.

B. Electrical equipment installed outside the building, or in environmentally wet locations shall carry a NEMA rating 3R or higher if indicated in the specifications or on the drawings.

C. Electrical equipment installed in harsh environments (i.e. natatoriums, greenhouses, etc.) shall carry a NEMA rating 4X, and be manufactured from stainless steel.

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D. Where specifications and drawings conflict (i.e. drawings indicated NEMA 3R, but specifications indicate NEMA 1), the higher rating shall be provided at no additional cost to the project.

1.15 WIRING LAYOUTS

A. Should it become necessary to rearrange any of the circuit or feeder wiring, approval to do so shall first be obtained from the Engineer. The Contractor will be supplied with a spare set of Drawings on which all such approved changes shall be noted. Upon completion of all work under this Contract, these Drawings shall be returned to the Architect/Engineer, who will issue a receipt for same.

1.16 FIELD MEASUREMENTS

A. Before ordering any materials or doing any work, Contractor shall verify all measurements at the building site, and shall be responsible for correctness of same. At no time shall the Contractor scale Drawings for the purpose of installation.

B. No extra compensation will be allowed on account of differences between actual dimensions and those indicated on the Drawings. Any difference which may be found shall be submitted to the Architect/Engineer for consideration before proceeding with the work.

1.17 COORDINATION

A. The Contractor shall cooperate with the other Contractors and shall arrange to eliminate conflicts with the equipment and work of the Contractors.

B. The Contractor shall be responsible for coordinating all electrical devices/equipment with the casework before rough-in. Any conflicts with casework and electrical devices/equipment shall be brought to the attention of the Architect/Engineer before rough-in. Any electrical device/equipment installed in conflict with casework shall be removed and reinstalled at the Contractor's expense.

C. The Contractor shall be responsible to coordinate all electrical conduits which are installed for rooftop equipment. Where the equipment can be fed from within the equipment curb, the contractor shall utilize this space. Where the equipment must be fed from the exterior, the contractor shall furnish and install a roof curb designed for conduit penetrations.

1.18 CHASES AND OPENINGS

A. The Contractor shall determine, in advance, the locations and sizes of all chases and openings necessary for the proper installation of his work and have same provided during construction. Any chase or opening not made during construction, due to the Contractor's failure to determine same in advance, shall be done by the Contractor at his own expense. Any unnecessary cutting shall be repaired to match the original conditions of the area disturbed at the Contractor's expense.

1.19 AIR PLENUMS

A. The Contractor shall use a conduit system or approved plenum rated wiring for all wiring located above ceilings.

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1.20 RECORD DOCUMENTS

A. Refer to Division 1 for Record Document requirements. The following requirements supplement the requirements of Division 1.

B. Mark Drawings to indicate revisions to conduit size and location both exterior and interior; actual equipment locations, dimensioned from column lines; concealed equipment, dimensioned from column lines; distribution and branch electrical circuitry; fuse and circuit breaker size and arrangements; support and hanger details; work performed via Change Orders; concealed control system devices.

C. Mark Specifications to indicate changes by addendum or Change Orders; actual equipment and materials used.

D. All new underground utilities shall be marked and dimensioned on site plan as-built drawings.

1.21 OPERATION AND MAINTENANCE DATA

A. Refer to Division 1 for Operation and Maintenance Manual requirements.

B. Contractor shall provide Operation and Maintenance data listed in individual section in addition to requirements listed in Division 1.

C. Included with operation and maintenance data, under a separate tab or volume, complied into a single place, shall be manufacturer recommended preventative maintenance measures for each piece of equipment installed as part of this project.

1.22 WARRANTIES

A. Division 1 warranties shall be considered minimum warranties. Any warranties listed in the individual sections that are longer than Division 1 warranties shall be honored.

B. Refer to individual sections for warranty requirements beyond those as specified in Division 1.

1.23 TEST AND ADJUST

A. All systems installed under this Contract shall be tested and adjusted to ensure that all equipment and systems meet or exceed the specified requirements.

1.24 PHASE LOAD BALANCE

A. A reasonable balance shall be secured on the phases of all main distribution feeders and bus bars.

B. Following installation and with the system in operation, the Electrical Contractor shall check the balance and rearrange connections so that the ampacity on any of the two single-phase phases of the main bus shall not vary more than 10% of each other.

1.25 PAINTING

A. Refer to the Division 1 for general painting requirements.

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B. The Contractor shall be responsible for all touch up painting on this project for electrical work.

C. The Contractor shall be responsible for painting of all conduits that is installed after general painting has been completed. In areas where the General Trades Contractor is not painting, this Contractor shall be responsible for painting conduits and boxes to match adjacent surfaces.

1.26 CLEANING

A. Refer to Division 1 Section, "Project Closeout" or "Final Cleaning" for general requirements for final cleaning.

B. The Contractor shall keep the building free of rubbish and material during the course of construction insofar as the work under this Contract is concerned.

C. Upon completion of the project, the Contractor shall remove all rubbish, surplus equipment and shipping labels and have all areas broom clean. The Contractor shall thoroughly clean all fixtures, and other electrical equipment, leaving same in first-class working condition.

1.27 INSTRUCTION OF OWNER'S PERSONNEL

A. The Contractor shall provide instruction of the owner's personnel as outlined in Division 1. The following requirements shall be included in addition to Division 1 requirements.

B. The Contractor shall provide the services of competent personnel and/or Manufacturer trained personnel to instruct employees designated by the Owner in the proper operation, care and maintenance of the equipment and system installed under the Contract.

C. A letter of certification itemizing the equipment, system, instructor, and bearing signatures of the employees instructed shall be delivered to the Engineer and the Owner upon completion of the project. The letter of certification shall note the number of hours spent in explanation and actual operation of system with maintenance personnel. If the Contractor cannot turn over this letter of certification with employee signatures, the Contractor shall be prepared to provide additional owner training, meeting the specification requirements, at no additional cost to the owner.

1. The Contractor shall keep notes of all of the training sessions, list discussion topics, questions and answers. The contractor shall provide these typed meeting minutes of the training sessions to all of the attendees and owner's representative. A final copy of these minutes shall also be provided with the O and M manuals for the applicable product.

D. The Contractor shall be responsible to video record each trained presentation session with the owner and the manufacturer and turn over the recordings to owner after completion of training session. The recordings may be turned over on DVD or Thumb drive. The Contractor shall obtain a signed receipt for the recordings proving the owner received them. If a copy of the receipt cannot be turned over and validated when requested, the contractor shall be responsible to provide additional training sessions as requested. A generic training video shall be acceptable in lieu of recording the owner's training session; however, this does not absolve the contractor of providing a private training session with the owner.

1.28 DELIVERY AND STORAGE OF MATERIALS

A. Refer to the Division 1 for delivery and storage of materials requirements.

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B. The Contractor shall provide for, or secure use of, suitable-dry storage space for the safe delivery and storage of his materials. The Contractor shall be responsible for providing their own storage trailers on site. The use of Owner's inside-building storage will not be permitted, unless specifically noted otherwise.

1.29 PROTECTION OF EQUIPMENT AND MATERIALS

A. Responsibility for care and protection of electrical work rests with the Contractor until it has been tested and accepted by the Owner. After delivery, before and after installation, protect equipment and materials against theft, injury, or damage in all cases.

B. Protect equipment outlets, and pipe openings with temporary plugs, caps, or burlap. Electrical conduit openings shall be covered with capped bushing or fiber disks and bushings.

C. The contractor shall be responsible to protect all existing electrical or communications equipment to remain from construction dirt and debris, whether created from this contractor or another contractor. The contractor shall determine the method needed to protect each piece of equipment to remain. Should existing equipment be damaged during demolition it will be the responsibility of the contractor to provide necessary repairs or replacement of the damaged equipment.

1.30 PROTECTION OF SENSITIVE ELECTRONICS

A. During construction activities, the Contractor shall protect all newly installed and existing sensitive electronics, including, but not limited to Data equipment (network electronics, servers, etc.), intercommunications equipment, telephone equipment, CATV equipment, security equipment and CCTV equipment with a method that will keep all construction dirt and debris from the equipment filters, whether generated by this contractor or other contractors.

B. At a minimum, the Contractor shall build wood frames around all equipment housed in freestanding and wall mounted racks when construction occurs within the vicinity of the equipment. Cover housing with minimum 6mil thick reinforced clear plastic sheeting. The enclosure shall include removable access panels to work on equipment and shall be sized to provide sufficient air flow around equipment to avoid excessive heat buildup. The contractor shall provide an exhaust fan at one end and a similar sized framed inlet opening at the other end with a removable MERV 8 filter. Filters shall be replaced within sufficient intervals to avoid excessive heat buildup.

C. The Contractor may propose an alternate protection method prior to construction; however, the Contractor shall be prepared to provide the enclosure if their method is rejected.

D. Should the equipment be damaged during construction, the contractor shall replace the equipment with the same piece at no additional cost to the owner.

1.31 SCAFFOLDING AND HOISTING

A. The Contractor shall provide all lumber and other material required for the erection of all staging, scaffolding, shoring, protective platforms, railings and ladders. Scaffolding shall be removed at the completion of the work.

B. The Contractor shall protect any flooring that is to remain. The Contractor shall inspect the flooring before the scaffolding is installed and report any damage that exists before the start of construction. The Contractor shall be responsible to repair any damage to the flooring after the scaffolding is removed to the acceptance of the owner at no additional cost to the owner.

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1.32 PERMITS AND FEES

A. Refer to the Division 1 for Permits and Fee requirements.

B. Unless noted otherwise, all electrical work permits, certificates, tests, and inspection fees required for the electrical work provided under this contract shall be paid by the Contractor, including any electrical licenses required to work on the project.

1.33 UTILITY COMPANY FEES OR CHARGES

A. Unless noted otherwise, all utility company (Electric, Telephone, Cable Television, Leased Fiber) fees or charges will be paid by the Owner directly to the utility companies.

PART 2 - PRODUCTS

Not Applicable.

PART 3 - EXECUTION

3.1 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

B. Refer to equipment Specifications in Divisions-2 through -25 for rough-in requirements.

3.2 EXTERIOR AND INTERIOR EXCAVATION

A. Prior to any digging outside and inside the building, the Contractor shall review all available existing documentation and review the excavation path with the owner’s representative to help determine the location of existing utilities and structures. Following review of this documentation, the Contractor shall provide Ground Penetrating Radar (GPR) to ensure there are no utilities in the area of excavation. Should any utilities be found, the contractor shall provide information to the engineer, architect and owner and propose alternate locations for the excavation. If the contractor neglects to perform the research and GPR prior to excavation and destroys any underground utilities, it shall be the responsibility of the contractor to repair the utilities to the engineer, architect and owner's satisfaction without any additional cost to the owner.

3.3 CUTTING AND PATCHING

A. Perform cutting and patching in accordance with Division 1. In addition to the requirements specified in Division 1, the following requirements apply. The Contractor shall be responsible for providing all cutting and patching required to perform his work unless noted otherwise.

B. Perform cutting, fitting, and patching of electrical equipment and materials required to:

1. Uncover work to provide for installation of ill-timed work.
2. Remove and replace defective work.
3. Remove and replace work not conforming to requirements of the Contract Documents.

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4. Remove samples of installed work as specified for testing.
5. Install equipment and materials in existing structures.
6. Upon written instructions from the Architect, uncover and restore work to provide for Architect observation of concealed work.

C. Cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical items indicated to be removed and items made obsolete by the new work.

D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

F. Unless noted otherwise, where equipment is being provided on existing roofing systems, the contractor shall provide all roof patching where he penetrates the roof. The roof patching must be performed by an authorized vendor of the roofing system, maintaining all existing roofing warranties. The Contractor must contract with the owner's existing roofing vendor all roofing work.

3.4 PROTECTION OF INSTALLED WORK

A. During construction activities, including cutting and patching operations, protect adjacent installations.

B. Patch existing finished surfaces and building components using new materials matching existing materials and experienced installers. For installers' qualifications refer to the materials and methods required for the surface and building components being patched.

3.5 ELECTRICAL INSTALLATION

A. Coordinate electrical equipment and material installation with other building components. Verify all dimensions by field measurements. If no dimensions are given, Contractor shall verify with Architect or Engineer before starting work. At no time shall the Contractor scale Drawings for the purpose of locating items.

B. Provide for chases, slots, and openings in other building components to allow for electrical installations. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.

C. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work. Give particular attention to large equipment requiring positioning prior to closing-in the building.

D. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible, or to meet current local, national and ADA codes.

E. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

F. Install systems, materials, and equipment to conform with submittal data, including Coordination Drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect/Engineer.

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G. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.

H. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.

1. Contractor shall also take care to leave access to other systems located behind electrical components being installed as part of this project. Should it be found that access has been blocked to other equipment requiring access (i.e. filters, valves, etc.), the offending system will be required to be removed and reinstalled at no additional cost to the owner.

I. Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are specified in Division 26 “Common Requirements – Electrical.”

J. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

K. Where exterior conduits, duct banks, equipment and pads are installed by this contractor, the contractor shall follow all NEC requirements, as well as those requirements listed on the drawings and in the specifications. Where excavation, both interior and exterior, is indicated to be performed by this contractor, backfill shall also be performed, meeting all requirements of the applicable drawing notes and specifications. Backfill shall include clean earth and/or stone, as specified in the applicable specifications, placed and tamped as indicated in the specifications. Provide all testing as outlined in the applicable specifications.

L. Electrical component installation in spaces where abuse may occur (i.e. gymnasiums, locker areas, exterior areas) shall be provided with vandal covers. Covers shall be provided with a means to be locked. System components include, but are not limited to light switches/dimmers, occupancy sensors, sound system controls, fire alarm devices, clocks, wireless access points, etc.

3.6 LOW VOLTAGE WIRING INSTALLATION

A. All low voltage wiring, installed above ceilings, must be plenum rated, unless noted otherwise. Wiring shall be installed perpendicular to steel, located in j-hooks and/or cable tray as available and allowed. Refer to individual specification and drawings for allowance if cable installation in cable trays.

B. All low voltage wiring, installed in spaces without ceilings, must be installed within conduit or other approved raceway. This requirement shall apply to finished spaces (i.e. gymnasium, etc.) and unfinished spaces (i.e. mechanical rooms, electrical rooms, etc.) Under no circumstances is exposed wiring acceptable.

C. The contractor shall be responsible to provide surge protection for all low voltage systems where copper lines leave and/or enter a building. System shall include, but not be limited to, voice, fire alarm, CCTV, television and security. All surge protection for low voltage systems shall be solid state, unless otherwise noted.

3.7 EXISTING INSTALLED EQUIPMENT

A. Where existing installed equipment (including, but not limited to gymnasium equipment (batting cage, divider nets, etc.), free hanging projection screens, theatrical equipment, etc.) is in the way of construction, the Contractor shall move equipment as required to accommodate their work.

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B. During relocation, and work, the Contractor shall take care to no damage the equipment. Should the equipment be damaged prior to work commencing, they shall take photographic evidence, and report, in writing to the Owner, Architect and Engineer, the existing observed damage.

C. Should the existing equipment be damaged during construction activities, the contractor shall repair at no additional cost to the Owner.

3.8 ELECTRICAL REQUIREMENTS FOR EQUIPMENT INSTALLATION

A. Conduit and power wiring of required size and voltage, from a panelboard or similar source, shall be furnished and installed by this Contractor, to the equipment furnished by another Contractor. A junction box or means of disconnect (as required) shall be furnished and installed at the equipment by this Contractor meeting the National Electric Code.

B. Unless noted otherwise, a full complement of electrical control components, required for the intended use and/or operation of specified equipment, including variable frequency controllers, speed controllers and/or other control devices required, whether integral or remote, shall be furnished by the Contractor furnishing the equipment. These control devices as well as power wiring (where required) through these devices shall be installed by this Contractor.

3.9 CONTROL WIRING FOR EQUIPMENT INSTALLED BY ANOTHER CONTRACTOR

A. This Contractor shall be responsible for providing all required control wiring, (except HVAC system control wiring) for any equipment provided by another Contractor which shall include, but not be limited to, motorized backboards, screens, partitions, curtains, motor operated doors, etc, unless noted otherwise.

B. The Contractor shall provide all boxes and conduit required for any equipment provided by another Contractor. Control wiring shall also include any wiring of motion or occupancy sensors for doors, curtains, etc.

C. Coordinate all required work for a complete and functional system with the Contractor supplying the equipment. Make all required connections.

D. Prior to installing any control wiring to any equipment, acquire control wiring diagrams and direction from the installing contractor.

3.10 TEMPORARY ELECTRIC/TELEPHONE

A. Refer to Division 1 "General Conditions."

B. Temporary Electric for Building Construction: Refer to Temporary Facilities for requirements.

C. Temporary Electric for Construction Trailers: Refer to Temporary Facilities for requirements.

D. Temporary Telephone for Construction Trailers: Refer to Temporary Facilities for requirements.

E. Lighting: Provide temporary lighting in accordance with OSHA, (5-footcandles) with local switching to fulfill security requirements and provide illumination for construction operations and traffic conditions.

1. Lamps and Light Fixtures: Provide general service lamps. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

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3.11 UTILITY COMPANY CONTACTS

A. Contact the following utility representative for coordination of this project:

1.	Electric:	Mr. Anthony Cavenas	484-781-4341
2.	Telephone (Windstream):	Mr. John Miller	717-725-1345
3.	CATV (Blue Ridge):	Mr. Shane Mentzer	717-433-8458 (smentzer@brctv.com)

B. The Contractor shall contact all utilities as soon as he receives a contract and is provided with the Notice to Proceed in order to ensure that utility coordination does not hold up the project at any time. Any project extension due to lack of early utility coordination will be this Contractor's responsibility and may result in Liquidated Damages be applied per contract milestones.

3.12 UTILITY COMPANY PROJECT NUMBERS

A. The Power Company project number for this job is: 58740433

3.13 UTILITY (POWER, TELEPHONE, CABLE TELEVISION and LEASED FIBER) SERVICE DOWN TIME

A. Utility services on this project may not be interrupted or down for any period of time during in school use days (by students or staff). All utility service interruptions or down time shall occur during non-school days, on weekends or holidays. All utility service interruptions or down time shall be coordinated with the school district a minimum of two (2) weeks in advance. The Contractor shall include any overtime, night, weekend or holiday pay required to ensure downtime for utility services is kept to a minimum and during periods that the building is not utilized.

3.14 ELECTRICAL DEMOLITION

A. The Electrical Contractor shall be responsible for all electrical demolition.

B. The Contractor shall be responsible for disconnecting and removing from the site all conduit, wiring, light fixtures, devices, panelboards, switchboards, transformers, disconnect switches, emergency generators, data, intercom, clock, sound, fire alarm, card access, security, CCTV, etc. The Owner shall tag or notify the Contractor as to any devices, equipment or systems which they wish to salvage before start of each phase of construction. See paragraph, "Salvage" for additional information.

C. The Electrical Contractor shall review all demolition drawings, including from other trades, and remove from the site all power wiring and associated electrical equipment, including, but not limited to wire, conduit, boxes, disconnecting means, supports, etc. feeding equipment that is being removed by other trades. This includes within the building, on the roof, attached to the building, and on the site.

D. Where fastened equipment is removed, the contractor shall be responsible to remove the associated lags or bolts that fastened the equipment down. Grind lags or bolts to below exiting surface and patch surface to match existing condition.

3.15 ELECTRICAL EQUIPMENT IN AND ABOVE CEILINGS

A. Where ceilings are being removed to accommodate phasing, the contractor shall tie up all low and line voltage wiring that is resting on the ceiling grid scheduled to remain or feeding a later phase until that wire can be removed.

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B. Any wire that is scheduled to remain shall be independently supported from the structure or walls per the applicable specification sections. Low voltage wire shall be installed in cable tray or j-hooks and line voltage wire shall be installed in conduit and supported per NEC.

C. Where ceilings are being removed to accommodate phasing, the contractor shall tie up all lighting, fire alarm equipment (smoke detectors, annunciation devices, etc.), intercom speakers, and other electrical equipment until the new ceiling is installed. Electrical devices shall be removed or reinstalled as scheduled on the documents.

D. All existing MC cable encountered above the ceiling, not supported per the NEC, shall be tied up and supported per NEC requirements when encountered.

E. All wire, conduit, electrical systems or electrical devices, including, but not limited to lighting, power wiring, receptacles, data, fire alarm, security, CCTV, access control, intercom, phone, etc. above or in the ceiling that is abandoned prior to construction or being abandoned as part of the construction shall be removed at no additional cost to the owner. At the completion of the project, there shall be no abandoned wire, conduit, electrical systems or electrical devices in or above the ceiling.

3.16 CONTINUATION OF SYSTEMS DURING PHASED PROJECT

A. The contractor shall include all wiring, accessories, programming, etc. as required to accommodate the following. The contractor shall be responsible to contact the owner's vendor of each system for the necessary programming, and subsequent decommissioning of the existing systems being removed.

B. During the construction process, it is the contractor's responsibility to ensure that all existing site lighting is functional while the building is occupied, until that particular phase is under construction. The contractor shall provide temporary conduit and wiring as required to maintain functionality of site lighting and control.

C. During the construction process, it is the contractor's responsibility to ensure that the building electric and all communications services are maintained during occupied periods. The contractor shall coordinate all downtimes as required per paragraph, "Utility Service Down Time." The contractor shall provide temporary prime generation as required utilizing diesel fuel to ensure that the building has electric service while occupied. The contractor shall be responsible to provide a rented generator and the diesel fuel itself at no additional cost to the owner.

D. During the construction process, it is the contractor's responsibility to ensure that the building life safety and non-life safety emergency systems remain active. The contractor shall provide temporary wiring and possibility additional temporary emergency generator as required to ensure that there is no interruption to the emergency system while the building is occupied outside the construction zone during each phase. It is imperative that the life safety remain active whether the building is occupied or unoccupied to maintain safety for all parties.

E. During the construction process, it is the contractor's responsibility to ensure that the building fire alarm system remain active. At a minimum, audible and visual devices as well as pull station must remain active within the construction zone. All existing fire alarm devices outside the construction zone shall remain active until the new system is installed. The contractor shall coordinate with the AHJ to verify that it will be acceptable to have two (2) separate systems in the building while the construction progresses; however, the two (2) systems must be tied together so that if one system alarms, they both alarm.

F. During the construction process, it is the contractor's responsibility to ensure that the building intercommunications system and telephone system remain active. The contractor shall provide temporary wiring and programming as required to ensure that there is no interruption to either system outside the construction zone during each phase.

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G. During the construction process, it is the contractor's responsibility to ensure that the building data network systems remain active. The contractor shall provide temporary backbone and horizontal wiring as required to ensure that there is no interruption outside the construction zone during each phase. The contractor shall coordinate with the owner to ensure the proper wiring is provided on a temporary basis.

H. In all cases, systems that require programming, including, but not limited to lighting control system(s), occupancy sensors, intercommunications system, security system, access control system, CCTV system, fire alarm system and area of rescue assistance system, shall be reprogrammed after each phase of construction to ensure that each system is functional. Final programming and training shall occur at substantial completion of the final phase. The warranty period for each system shall commence only after final programming and training.

I. All required night, weekend and holiday time required to ensure that the above requirements are met shall be provided at no additional cost to the owner.

3.17 SALVAGE

A. The Owner reserves the right to salvage any electrical equipment prior to the start of each phase of construction.

3.18 ELECTRICAL ROOM LAYOUTS

A. The contractor shall be responsible for submitting electrical room layouts to the engineer prior to any panel or equipment rough ins. Layouts shall show that all equipment will be installed to meet the N.E.C. Code clearance requirements. The Contractor shall bare all costs associated with any changes required if electrical rough-ins are done prior to layout approval.

B. It shall be the contractor's responsibility to verify all N.E.C. clearance requirements prior to installation, including, but not limited to ductwork, piping, or other equipment above electrical equipment, as well as all horizontal requirements.

END OF SECTION 26 00 10

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