

## PART 1 - GENERAL

## 1.01 SUMMARY

## A. Section Includes:

1. General Requirements for Electrical Work in accordance with the Contract Documents.

## B. Related Documents:

1. This Section, 26 05 00, governs all requirements as applicable to the Electrical work specified in other Sections of Division 26.

## C. Division Of Responsibility:

1. The requirements under Section 26 05 00 are intended for the party or parties who have been duly awarded the applicable portion of work to be performed under the indexed sections of Division 26 also known as the Electrical Work.
2. In addition to electrical work required under Division 26, the scope of electrical work specified under Division 26 shall include the provision of all required power wiring to the equipment specified under General Construction Trades and Divisions 21, 22, 23, 26, 27 and 28. Provide power to all laboratory equipment, doors, motors, electric heaters, light fixtures, heat tracing equipment, control panels, electrically actuated valves, dampers, and other devices, specified under the various sections of all Divisions included in the project.

## 1.02 REFERENCE

## A. Compliance with the following codes and standards shall be required as applicable:

1. ANSI American National Standards Institute
2. ASTM American Society for Testing Materials
3. CBM Certified Ballast Manufacturers.
4. DEMA Diesel Engine Manufacturer's Association
5. EPA United States Environmental Protection Agency
6. ETL Intertek/Electric Testing Laboratories
7. FM Factory Mutual
8. ICEA Insulated Cable Engineers Association
9. IEEE Institute of Electrical and Electronics Engineers
10. IES Illumination Engineering Society of North America.
11. NEC National Electrical Code
12. NEMA National Electrical Manufacturers Association

- 13. NETA Inter-National Electric Testing Association
- 14. NFPA National Fire Protection Association
- 15. NFC National Fire Codes (NFPA)
- 16. IBC-NJ International Building Code – 2009, New Jersey Edition
- 17. NJRSC New Jersey Rehabilitation Sub-Code
- 18. OSHA Occupational Safety and Health Administration
- 19. UL Underwriters' Laboratories, Inc.

- B. Conform to materials and equipment rating standards, listings or classifications of the above organizations as well as ratings, listings or classifications accepted under local codes and laws.

### 1.03 DEFINITIONS

- A. "Provide" means furnish and install, complete, the specified material, equipment or other item and perform all required labor to make a finished installation.
- B. "Furnish and install" has the same meaning as given above for "Provide."
- C. "Engineer" or "Architect" means the authorized representative of the Owner.
- D. Refer to General Conditions for other definitions.

### 1.04 CONTRACT DRAWINGS

- A. The Contract Drawings indicate, in schematic and diagrammatic form, the extent and general arrangement of the various electrical systems. If the Contractor deems that any departures from these drawings are necessary, detailed drawings and descriptions of these departures and a statement of the reasons shall be submitted to the Engineer for review and comment as soon as practicable. No departures from the arrangements shown on the Contract Drawings shall be made without prior written approval of the Engineer. Provide all devices, conduit, wire, misc. steel, etc., for a complete installation.
- B. Conduits and other raceway systems shall be installed as shown or as noted on the Contract Drawings. Elevations and dimensions where indicated are a guide only and are subject to change with actual job conditions and clearances. Relocation resulting from interferences shall be made at no additional cost to the Owner.

### 1.05 REVIEW OF CONTRACT DOCUMENTS AND SITE

- A. With the submission of his Bid, Contractor shall give written notice to the Owner of any materials or apparatus believed in-adequate or unsuitable, in violation of laws, ordinances, rules or regulations of Authorities Having Jurisdiction, and any necessary items of work omitted. In the absence of such written notice it is mutually agreed that the Contractor has included the cost of all required items in his Proposal for a complete project.
- B. Contractor shall acknowledge that he has examined the Plans, Specifications and Site, and that from his own investigations he has satisfied himself as to the nature and location of the work; the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials; availability of

labor, water, electric power, roads and uncertainties of weather; the conformation and condition of the ground; the character, quality and quantity of surface and subsurface materials to be encountered; the character of equipment and facilities needed preliminary to and during the execution of the work; all federal, state, county, township and municipal laws, ordinances and regulations particularly those relating to employment of labor, rates of wages, and construction methods; and all other matters which can in any way affect the work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with the available information concerning these conditions will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work.

- C. Owner assumes no responsibility for any understanding or representation made during or prior to the negotiation and execution of this Contract unless such understanding or representations are expressly stated in the Contract, and the Contract expressly provides that the responsibility, therefore, is assumed by the Owner.

#### 1.06 STANDARD PRODUCTS AND APPROVED EQUAL CLAUSE

- A. Each item of equipment furnished by the Contractor shall be essentially the standard product of the manufacturer. All material and equipment shall be of the best quality normally used in good commercial practice and shall be the product of reputable manufacturers. Each major component shall bear a nameplate giving the name and address of the manufacturer and the catalog number or designation located in an easily visible location.
- B. Throughout the Specification types of material and equipment may be specified by manufacturer's name and catalog number as a basis of design and for convenience only, and not for the purpose of limiting competition, except for items for which "no substitutions will be accepted" is specifically indicated.
- C. Where the Contractor proposes to use an item of equipment other than that specified or shown on the Contract Drawings which requires any redesign of structure, partitions, foundations, piping, wiring or any other part of the mechanical, electrical or architectural layout, all such redesign, all new drawings and detailing required therefore, shall be prepared by the Contractor without cost to the Owner and submitted to the Engineer for his review.

#### 1.07 SUBMITTALS

- A. Procedure:
  - 1. Prepare a schedule of specific submissions at the outset of the Project for the Owner's review and approval; make submissions listed below and in the other Sections of Division 26 of the Project Specifications.
    - a. If submissions listed in other Sections of Division 26 are more specific than those listed below, comply with the more specific requirements.
    - b. Failure of the Contractor to submit Shop Drawings in ample time for checking shall not entitle him to an extension of Contract time, and no claim for extension by reason of such default will be allowed.
    - c. Piecemeal submittals are unacceptable and will not be reviewed. No submittal shall be considered for review, the review of which is contingent upon acceptance of other features for which submittals have not been submitted.

- d. Submittals from Vendor without Contractor's review and approval stamp will not be reviewed.
- e. Submittals shall not be used by the Contractor as a means to secure approval of a substitution. Contractor must indicate all deviations, omissions and substitutions in his submittal; if there are none of these 3 exceptions, he shall then state on the submittal: "NO EXCEPTION TAKEN". Any submittal without stated exceptions, or without statement that no exception is taken, will not be reviewed and will be rejected and returned to Contractor for rectification.
- f. All products of a similar nature (i.e., Panelboards, fuses, wiring devices, etc.) shall be provided by one manufacturer.

B. Shop Drawings:

1. Manufacturer's Drawings:

- a. Submit equipment listed in all applicable Sections - include material specifications, operating characteristics and finishes, specified agency listings or approvals.
- b. Cuts, brochures or other literature submitted for expeditious approval but incomplete or missing items of hardware or software (performance data) shall be re-submitted until all system or equipment components have been reviewed and approved. Any item not included in the original or first submission shall be considered outstanding work until such item of equipment or work has been submitted or installed in place exactly conforming to the intent of the contract documents.
- c. Contractor shall provide preliminary layout drawings of all major pieces of equipment (i.e., switchgear, switchboards, transformers), confirming that the submitted product physically fits within the architectural enclosures. This drawing is required along with the manufacturer's product data.

2. Installation Drawings:

- a. Furnish coordinated drawings of equipment installation, including interconnecting conduit and supports. Minimum scale for these drawings shall be 1/4 inch equals 1 foot.
- b. Coordinate space requirements for mechanical, plumbing and other trades in the vicinity of work.
- c. Include connections, anchorages and fastenings for equipment and conduit.
- d. Make allowance for clearances for access to and maintenance of equipment.
- e. Do not install any conduits or equipment, in any area, prior to obtaining approval of its layout by means of submitting shop drawings.

- f. Any missing items of equipment, material or labor, during initial submission of shop drawings, are to be completed and re-submitted for final approval. Shop drawing should not be used as a vehicle for obtaining variances, deviation or omission from the scope of Contract Documents. Approval of a submittal shall pertain to the portions that conform to the intent of the Contract Documents.
  - g. Submission of any missing, incomplete or otherwise deviant layout is subject to re-submission until all contract requirements have been properly included or shown on the same layout.
- C. Required Samples:
  - 1. Color samples, for prefinished items.
  - 2. Natural finish metals, for quality of finish.
- D. Reports:
  - 1. Compliance with listings and approvals for equipment and for fire ratings.
  - 2. Acceptance certificates from inspecting agencies.
  - 3. Complete printed and illustrated operating instructions where required in report format.
  - 4. Manufacturer's performance tests on operating equipment.
  - 5. Performance reports for vibration isolation equipment.
  - 6. Additional reports as noted in other sections.
- E. Specific references to any article, device, product or material, fixture or item of equipment by name, make or catalog number shall be interpreted as establishing a basis of cost and a standard quality. All devices shall be of the make and type listed by Special Agencies, such as the Underwriters' Laboratories, and where required, approved by the Authority Having Jurisdiction.
- F. Contractor shall be responsible for any deviations in equipment size or configuration and access requirement, from specified products.

## 1.08 COORDINATION

- A. Contractor shall prepare preliminary shop drawings suitable for use in coordinating his work with the work of other trades. The HVAC Section shall prepare and furnish sepia prints at  $3/8" = 1'-0"$  scale with all trades indicating piping, ductwork and conduit in relation to all structural elements of the construction, including floor elevations; steel locations, size, and elevations; partitions locations; door locations and direction of swing; and all other information required to assure coordination of the electrical, sheetmetal and piping trades and fire protection in relation to the Architectural function of the project. Coordination meetings shall be held under the supervision of the Construction Manager (CM). Each trade shall have proper representation at all coordination meetings for the purpose of detailing, on the sepia print mentioned above, the exact location and routing of their work. After the conclusion of the coordination at the working meetings, each trade shall sign the coordinated sepia, copies of which shall be distributed by the CM to all parties

concerned including the Owner. Final shop drawings of all trades shall be in accordance with the coordinated drawing, after which final shop drawings shall be submitted for final approval.

- B. If the Contractor installs work so as to cause interference with work of other trades, he shall make necessary changes in work to correct the condition without extra charge.
- C. Dimensional layout plans of equipment rooms shall be made showing all bases, pads and inertia blocks required for electrical equipment. Include dimensions of bases, bolt layouts, details, etc.
- D. Contractor shall furnish all necessary templates, patterns, etc., for installing work and for purpose of making adjoining work conform, furnish setting plans and shop details to other trades as required.

#### 1.09 MEASUREMENTS

- A. Contractor shall base all his measurements, both horizontal and vertical from established bench marks. All work shall agree with these established lines and levels. He shall verify all measurements at site; and check the correctness of same as related to the work.

#### 1.10 LABOR AND MATERIALS

- A. All materials and apparatus required for the work shall be new, of first-class quality, and shall be furnished, delivered, erected, connected and finished in every detail, and shall be so selected and arranged as to fit properly into the building spaces.
- B. Contractor shall remove all materials delivered, or work erected, which does not comply with Contract Drawings and Specifications, and replace with proper materials, or correct such work as directed, at no additional cost to the Owner.

#### 1.11 COVERING OF WORK

- A. No electrical equipment, raceways or other work of any kind shall be covered up or hidden from view before it has been examined by the Engineer. Any unsatisfactory or imperfect work or materials that may be discovered shall be removed and corrected immediately after being rejected and other work and materials shall be provided which shall be satisfactory to the Engineer.

#### 1.12 PROTECTION

- A. Contractor shall protect the work and material of all trades from damage by his work or workmen, and shall replace all damaged material with new.
- B. Contractor shall be responsible for work and equipment until his work is finally inspected, tested, and accepted; he shall protect his work against theft, injury or damage; and carefully store material and equipment received on site which is not immediately installed; close open ends of work with temporary covers or plugs during construction to prevent entry of obstructing material.
- C. Contractor shall be responsible for the preservation of all public and private property, along and adjacent to the work, and shall use every precaution necessary to prevent damage or injury thereto. He shall use suitable precautions to prevent damage to

pipes, conduits and other underground structures or utilities, and shall carefully protect from disturbance or damage all property marks until an authorized agent has witnessed or otherwise referenced their location, and shall not remove them until directed.

- D. All mechanical and electrical equipment delivered to the site shall have appropriate wrapping to protect them from rain, flood, wind, construction debris and all types of water damage normally encountered at construction sites. Protection of equipment such as switchboard, transformers, panelboards, luminaires and similar equipment shall be the responsibility of the Contractor receiving such equipment at the jobsite for installation under Division 26.

#### 1.13 CUTTING AND PATCHING

- A. Provide all cutting, rough and finish patching required for systems and equipment included in these specifications.
- B. Furnish and locate all sleeves and inserts required before the new floors and walls are built; Contractor shall pay the cost of cutting and patching required for pipes where sleeves and inserts were not installed in time, or where incorrectly located. Provide all drilling required for the installation of hangers.
- C. All holes cut through concrete slabs or arches shall be punched or drilled from the underside. No structural members shall be cut without the written approval of the Architect and/or the Structural Engineer and all such cutting shall be done in a manner directed by him.
- D. Contractor shall not do any cutting that may impair strength of building construction. No holes, except for small screws, may be drilled in beams or other structural members without obtaining prior approval. All work shall be done in a neat manner by mechanics skilled in their trades and as approved.
- E. Provide sleeves and fire stopping at all conduit penetrations in floors, walls and roof penetrations in accordance with recognized standards.

#### 1.14 EXCAVATION AND BACKFILLING

- A. Excavation and backfilling of trenches required for the installation of all underground service piping is to be provided by each respective Section involved.
- B. Trenching: Excavate to required depth and grade. Each trade will be responsible for the required slopes, inverts, bed material, and all other pertinent requirements.
- C. Bottom of trench shall be accurately excavated to provide firm, uniform bearing for bottom of the pipe. Pipe having bells, sleeves or other enlargement at joints to have recesses excavated to accommodate these joints.
- D. Backfilling: Trenches shall not be backfilled until piping has been tested. Backfill consisting of sand or selected excavated material shall be placed to a level equal to the final grade and hand compacted as required to produce the same density as the soil in the surrounding areas. Furnish and run constantly, if required or directed, sufficient pumping machinery to keep trenches free from water up to the time of inspection and acceptance of that part of this work.

- E. Refer to General Conditions for additional requirements governing excavation and backfilling. These requirements shall prevail unless superseded by specific requirements in Division 26.
- F. Where any work pierces waterproofing, including waterproof concrete, the method of installation shall be approved before work is performed. Each Trade Contractor shall provide all necessary sleeves, caulking and flashing required to make openings absolutely watertight.
- G. Provide sheet piling where required to properly support sides of trenches and excavations.

#### 1.15 CONCRETE AND GROUTING

- A. Requirements for concrete and grouting are specified in other Sections.
  - 1. Concrete shall be 3,000 psi stone concrete with water reducing admixture, except where otherwise specified.
  - 2. Concrete shall have air entraining admixture where exposed to weather.
- B. Contractor shall provide housekeeping pads, roof curbs, thrust blocks, inertia blocks, etc.
- C. Concrete housekeeping pads: 4" minimum thickness, sized to cover the full area of each piece of equipment provided.
- D. Concrete bases: Dimension and height to suit the approved equipment.
- E. Outside the building all concrete work related to electrical equipment shall be provided by the Trade Contractor of Division 26, unless otherwise noted in the Contract Documents.

#### 1.16 ACOUSTICAL PERFORMANCE OF EQUIPMENT AND SYSTEMS

- A. All work shall be designed to operate, and shall operate, under all conditions of load, without any objectionable sound or vibration. Sound or vibration noticeable outside of the room in which installed, or annoyingly noticeable inside its own room, will be considered objectionable. Sound or vibration conditions considered objectionable and caused by failure to follow the Contract Documents or manufacturer's installation instructions shall be corrected in an approved manner by the Contractor at his expense.

#### 1.17 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Demonstration and Training for Owner's Personnel:
  - 1. After all equipment is functioning properly, each electrical system including fire alarm at each building is to be automatically operated for ten (10) working shifts, and not to be adjusted during this period, as scheduled at the convenience of the Owner. Any adjustments will void the test and start the time period all over again.
  - 2. The hours of operation for each building are to include the Owner's designated personnel in each shift.



3. During this period, instruct the Owner's personnel in the use, operation and maintenance of all equipment of each system. Training will include a lecture-type instruction given in a non-machine room environment. During the lesson, normal operation of the system installed and operating will be explained, along with troubleshooting procedures. This will be followed by a field inspection and demonstration of equipment.
  4. The above instruction is exclusive of that required of specified equipment manufacturers. If more stringent or longer instruction is indicated for specific equipment or systems, these shall supersede the above requirements.
- B. Operating and Maintenance Data:
1. Provide four (4) complete sets of manufacturer's catalogs, instructions, maintenance and repair information and parts lists for operating equipment and devices.
    - a. Include factory-furnished wiring diagrams and control diagrams.
    - b. Submit seven (7) sets of instructions for distribution.
  2. Data for the equipment actually installed is to be submitted.
  3. The data is to be carefully checked for accuracy by comparison with the installed equipment nameplates.
  4. Provide a recommended list of spare parts for equipment and list of special, non-standard tools to service equipment.
  5. Index and assemble the instructions in durable loose-leaf binders.
  6. The completed binders are to be available at the time the equipment installation begins.
  7. In addition, follow all requirements of Division 01 "Execution and Closeout Requirement".

#### 1.18 RECORD DRAWINGS

- A. Provide and maintain a currently up-to-date record set of reproducible prints showing all changes, additions or omissions made during construction. Contractor shall, at his own expense, produce the Record Drawings.
- B. Deliver four (4) sets of all as-built drawings and one (1) set of reproducibles of the record drawings to the Owner before submitting requisition for final payment.
- C. Shop Drawings shall be cross-referenced on the mylar copies for this requirement where applicable.
- D. AutoCAD background, if desired to be obtained from Engineer, sign release and indemnification and pay fee.
- E. Submit AutoCAD compatible as-built drawing files.

## 1.19 WARRANTY

- A. The following supplements the GENERAL CONDITIONS for Electrical Work:
  - 1. Non-durable, expendable items such as lamps are not subject to replacement after the date of acceptance.
  - 2. Warranty time limits for equipment exceeding those indicated in GENERAL CONDITIONS are specified in the applicable Sections of Division 26.
- B. In addition, follow all requirements of the General Conditions and Addendum to General Conditions - Execution and Closeout Requirements: Closeout procedures.

## PART 2 - PRODUCTS

### 2.01 IDENTIFICATION

- A. Refer to Section 26 05 53 for requirements.

### 2.02 ACCESS DOORS

- A. General:
  - 1. Provide steel, flush four-sided frame and door assembly, chemically cleaned after fabrication and painted with rust inhibitive primer.
  - 2. Provide hardware and locking devices.
  - 3. Provide access doors required for access to electrical work through finished wall construction and non-removable ceiling construction.
  - 4. Coordinate location information with appropriate trades.
  - 5. Security Areas shall be provided with security access doors.
- B. Provide flush type access door or panel no smaller than 18" x 18" and no larger than 30" x 30" for all junction or pull boxes located in chases, walls, non-accessible hung ceilings or floors. Finish shall be prime coat, except floor panels which shall be polished brass or chrome plate. Doors and trim 14 gauge steel, frame 16 gauge steel, with flush concealed and standard flush locks, screwdriver operated cams, of Milcor manufacturer or approved equal.
  - 1. All panels and their exact location subject to approval of the Architect.
  - 2. Where space conditions prevent door swinging open, provide removable door on lift-up hinges. This will only be accepted on a case-by-case basis. This condition must be submitted to the Owner and Engineer for approval prior to installation.
  - 3. Furnish a complete list locating all access doors required in finished walls, ceilings, partitions, shafts and other inaccessible locations.

### 2.03 PRIME PAINTING

- A. All exposed conduits, outlet boxes, pull boxes, splice boxes, support, etc. in finish spaces shall be painted as specified herein.

- B. All ungalvanized surfaces shall be painted with zinc chromate, or approved equal, and all galvanized surfaces shall be prime coated with a phosphate pretreatment coating, dry film thickness of 0.35 with a 0.50 mil. one coat Glid-Guard galvanized steel primer Y5229, or approved equal.

## 2.04 CLEANING AND ADJUSTING

### A. Notification:

1. Inform Owner and Architect's field representatives of all cleaning schedules one week prior to starting.
2. Notify Owner and Architect again, 48-hours prior to each event. If neither attends the procedures, notify in writing, the specific task performed 24-hours after each event.
3. Damage to the building and equipment resulting from tests shall be repaired at no additional cost to the Owner.
4. Tests claimed to have been performed without following above procedures shall be deemed as not performed.

### B. Cleaning:

1. Clean out all debris and dirt from the interior of all switchboards, panelboards, transformers and switches. Blow out transformers with dry nitrogen; pressure shall not exceed 15 psi. Use Vacuum cleaner with bag and cartridge filters to remove dirt and debris from the interior of unit substations, switchboards, panelboards, ATS's and switches. After cleaning, the systems shall be tested by an independent organization, approved by the Owner prior to testing.
2. Clean all materials and equipment; leave in condition ready to operate and ready to receive succeeding finishes where required.
3. Clean the operating equipment and systems to be dust free inside and out.

### C. Permanent Equipment Operating During Construction:

1. Use only in same service as the permanent applications, provided that written approval is granted by the Owner.
2. Expendable media, including lamps used for temporary operation and similar materials are to be replaced just prior to final acceptance.

### D. Retouch or repaint equipment furnished with factory finish as required to provide same appearance as new.

### E. Tools:

1. Provide one set of specialized or non-standard maintenance tools and devices required for servicing the installed equipment.

## PART 3 - EXECUTION

### 3.01 GENERAL

#### A. Temporary Protection:

1. Provide and maintain protection for the work whether completed or in progress.
2. Provide suitable coverings and enclosures.

#### B. Scaffolding, Rigging and Hoisting:

1. Provide all scaffolding, rigging and hoisting services necessary for erection, and/or delivery into the premises, of any equipment and apparatus furnished. Remove from the premises when no longer required.

#### C. Waterproofing:

1. Where any work pierces waterproofing, including waterproof concrete, the method of installation shall be as approved by the Architect before work is done. This Contractor shall provide all necessary sleeves, caulking and flashing required to make openings absolutely watertight.

### 3.02 EQUIPMENT BASES, PLATFORMS AND SUPPORTS

- A. Provide supporting platforms, steel supports, anchor bolts, inserts, etc., for all equipment and apparatus requiring access for service and maintenance.
- B. Obtain prior approval for installation method of structural steel required to frame into building structural members for the proper support of equipment, conduit, etc. Welding will be permitted only when approved by the Architect or the Structural Engineer.
- C. Submit shop drawings of supports for approval to the Architect before fabricating or constructing.
- D. Provide leveling channels, anchor bolts, complete with nuts and washers, for all apparatus and equipment secured to concrete pads and further supply exact information and dimensions for the location of these leveling channels, anchor bolts, inserts, concrete bases and pads.
- E. Where supports are on concrete construction, take care not to weaken concrete or penetrate waterproofing.

### 3.03 ACCESSIBILITY

- A. The installation of electrical equipment, including panelboards, disconnect switches, motor starters, etc., shall be in accordance with the requirements of Article 110 or the National Electrical Code relative to work space around equipment. Equipment which is installed and does not have the working space required by the NEC, shall be relocated by the Contractor at no additional cost to the Owner.

### 3.04 PROTECTION

- A. Contractor shall protect the work and material of all trades from damage by his work or workmen, and shall replace all damaged material with new material. The plan shall outline corrective action to repair and/or replace the object(s) including all materials to be utilized. Implementation of corrective plan shall be subject to final approval from the Architect.

The Building systems are to remain active during the project as the construction will be phased. Refer to Scope of Work document prepared by the Construction Manager.

Contractor shall be responsible for protecting and maintaining the systems for the duration of the project. Contractor shall note that the building shall remain in operation throughout the duration of construction.

- B. Contractor shall be responsible for work and equipment until his work is finally inspected, tested and accepted; he shall protect his work against theft, injury or damage; and carefully store material and equipment received on site which is not immediately installed; close open ends of work with temporary covers or plugs during construction to prevent entry of obstructing material.
- C. Contractor shall be responsible for the preservation of all public and private property, along and adjacent to the work, and shall use every precaution necessary to prevent damage or injury thereto. He shall use suitable precautions to prevent damage to pipes, conduits and other underground structures or utilities, and shall carefully protect from disturbance or damage all property marks until an authorized agent has witnessed or otherwise referenced their location, and shall not remove them until directed.
- D. Where conduit, wire or equipment to remain is inadvertently damaged or disturbed, cut out and remove damaged section and provide new pipe, ductwork, insulation or equipment of equal capacity and quality.
- E. Where conduit and wiring to remain are inadvertently damaged or disturbed, cut out and remove damaged portion and all damaged wiring from the source switchboard, panelboard or pullbox to the destination connection point. Provide new wiring of equal capacity.
- F. Vibration: Contractor shall reduce the construction dust not to adversely affect operation of the building. Contractor shall keep vibration to a minimum and not have adverse effect to the operation of the building.
- G. Dust Control: Provide adequate filters and dust collectors as required for building operation.

### 3.05 DEMOLITION WORK RELATED TO EXISTING WORK

- A. Contractor shall disconnect and remove all abandoned, unused or discarded equipment (piping, conduits, wires, ductwork, tubing, supports, etc.) from the areas of work as indicated on Drawings.
- B. Contractor shall mark out all items to be removed and all items to remain in the field and review with the Construction Manager and Owner prior to demolition.

- C. Provide firestopping at all conduit/pipe penetrations at rated construction, where ducts, piping/conduit, etc. have been removed.
- D. Whenever existing equipment is disconnected from its services, remove all pipe, conduit or duct branches or runnouts to the point of connection to the existing pipe riser or electrical panel or duct shaft as the case may be. Cap off pipes or ducts near the risers, valved outlets or at mains. Remove all ductwork as indicated on plans and provide sheet metal cap (minimum 24 gage) at all connections to existing ductwork that is to remain. Provide temporary ducts with dampers and valved pipes as required to keep system in operation and occupancy of building.
- E. Cutting shall be done carefully in order not to disturb systems or services in areas where demolition is not required.
- F. Fully charged fire extinguisher and/or active hoses are to be on sight for fire watch during all burning conditions that require Oxygen/Accel gas for cutting or welding, soldering and the creation of dust, that may activate the fire alarm system, requires that the system be put on bypass for the affected zones. Coordinate shutdown with Owner.
- G. Equipment specified or indicated to be demolished shall be removed from the project site. All ballasts shall be tested for PCBs and mercury before removal. Test results shall be submitted to the Owner, and ballasts shall be disposed of properly.
- H. All circuits affected by the demolition work shall be de-energized at their source prior to beginning any demolition work.
- I. Provide additional support for all existing conditions, cabling and devices to remain which are affected by demolition of existing ceilings and partitions.
- J. Protect existing systems, pipes, conduits and communications wiring to remain with flame retardant plywood.
- K. Where portions of existing branch circuits or feeders are removed, maintain the continuity of circuiting to remaining devices and maintain and restore, if interrupted, all conduits, circuits and feeders passing through areas of work and servicing undisturbed areas.
- L. Drawings are general in nature and do not indicate full extent of removal required, including all hangers, supports, ancillary devices, etc.

### 3.06 MODIFICATION OF EXISTING WORK

- A. Contractor shall perform all work as shown or as specified, within the existing site and structures as part of this Contract without detriment to the existing systems or equipment to be kept in operation or maintained in their places.
- B. For full extent of modifications to be done to existing systems, Contractor shall inspect existing systems and site conditions to familiarize himself with the complexity of his work related to removals and relocations required, and the existing finishes to be preserved without any damage resulting from possible careless installation procedures. Upon written request by the bidders, Owner shall make the existing schematic plans available for inspection (at his own address) without any responsibility for their completeness or accuracy.

- C. As-Built drawings are not available on the existing installations. Any drawings that may be available to the Contractor are for information only. All field criteria must be field verified by Contractor.
- D. Contractor shall provide all temporary work, conduit, wiring, equipment, remove, relocate existing work and reconnect with new material, supports, accessories to keep existing system, building in operation and for installation of new work as part of the project cost.
- E. All cutting shall be done only by mechanics skilled in the particular trade which is affected. No cutting shall be done without proper protections against damage, dirt and dust resulting therefrom or without proper safeguards to workmen, the public, and occupants of buildings.
- F. Before cutting is started in any location, Contractor shall carefully investigate conditions influencing human and structural safety. Existing conduit, wiring and items concealed in walls and slabs, wherever these walls and slabs are removed, shall be properly relocated, rerouted or removed as the case may require.
- G. General Construction trades shall perform all finish masonry, repairing, restoring and finishing of all cut openings, closing up of existing openings, and removing and restoring the affected sections of the suspended ceilings.
- H. If, during partial occupancy of the building, circumstances necessitate temporary shutdown of any facilities or otherwise interfere with access to building, owner shall be given a minimum of 48 hours notice before doing such work.
- I. In all areas where interface, relocation or alternation work is to be done, Contractor shall disconnect and remove from the premises all existing conduit, wiring, etc., that will not be required to remain in service after the alterations are completed. All such equipment (except as requested as salvage by the Owner) shall become the property of this Contractor, and he shall remove same from the premises immediately upon disconnection. Existing conduit, wiring, etc., being removed shall not be reused.
- J. Contractor shall move or relocate any existing electrical equipment, conduit, wiring, etc., which may temporarily interfere with the construction, (to a temporary location) if the existing equipment is to be kept in operation during construction. He shall also install temporary conduit, wiring or equipment that might be required (during demolition or excavation and during the construction of tunnels, retaining walls, footings or columns) for offsetting all conduit around the construction area in order to maintain services to the existing systems. Provide temporary piers, supports and hangers as required for excavation.
- K. Provide all cuts and openings through structural slabs and walls. Contractor shall coordinate his work with concrete contractor and provide necessary dimensions for all openings.
- L. Upon completion, remove all temporary conduit/wiring and equipment, shoring, scaffolds, etc., and leave all areas clean and free from material and debris resulting from work performed under this Section. Provide rough patching in areas shown.

### 3.07 USE OF EQUIPMENT

- A. The use of any equipment, or any part thereof, for purposes other than testing even with the Owner's consent, shall not be construed to be an acceptance of the work on

the part of the Owner, nor shall it be construed to obligate the Owner in any way to accept improper work or defective materials.

- B. Use of permanent equipment for temporary services must be approved in writing by Owner.

### 3.08 CODES, RULES, PERMITS & FEES

- A. The Contractor shall give all necessary notices, obtain all permits and filings including, but not limited to, New Jersey DEP, New Jersey DCA, IBC-NJ Building Code requirements, and pay all government sales taxes, fees, and other costs, in connection with his work. However, all utility connections, extensions, and tap fees for water, storm, sewer, gas, telephone and electricity shall be paid directly to utility companies and/or agencies by the Owner, unless otherwise indicated. The Contractor shall file all necessary plans, prepare all documents and obtain all necessary approvals of all governmental departments having jurisdiction; obtain all required certificates of inspection for his work and deliver same to the Owner's Representative before request for acceptance and final payment for the work.
- B. The complete design and construction shall conform to the requirements of the IBC-NJ, NFPA, NEC, UL and any other local or state code which may govern.

### 3.09 FINAL REVIEW

- A. Contractor shall arrange and schedule final review of work and shall notify the Architect in writing that the Contractor has thoroughly checked his work and, in the opinion of the Contractor, is ready for final review.
- B. During the entire period schedule for these reviews, the Contractor and representatives of each manufacturer of equipment involved shall be present. All of these organizations shall have sufficient and competent personnel present so that adjustments can be made to all systems without delay.

### 3.10 ACCEPTANCE

- A. The operation or the temporary use of the equipment and the mechanical and electrical installation, by the Owner does not constitute an acceptance of the work. The final acceptance is to be made after the Contractor has adjusted his equipment, demonstrated that it fulfills the requirements of the Contract Documents, and has furnished all the required Certificates. Warranties and guaranties are effective after the acceptance.

END OF SECTION