

DIVISION 26 - ELECTRICAL**SECTION 26 00 00 - STANDARD CONDITIONS FOR ELECTRICAL WORK****PART 1 - GENERAL**

1.01 REGULATIONS, CODES, STANDARDS

- A. Reference Codes, applicable sections of the following codes and standards shall be considered as binding to the work of this project:
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| NEMA | National Electrical Manufacturers' Association |
| NEC | National Electrical Code (NFPA 70) - 2017 Edition |
| NECA | National Electrical Contractors' Association |
| NEIS | National Electrical Installation Standards |
| EGSA | Electrical Generating Systems Association |
| IBC | International Building Code |
| NFPA | National Fire Protection Association |
| IEEE | Institute of Electrical and Electronics Engineers |
| UL | Underwriter's Laboratories, Inc. |
| IES | Illuminating Engineering Society |
| OSHA | Occupational Safety and Health Administration |
| ANSI | American National Standards Institute |
| ASTM | American Society for Testing and Materials |
| FM | Factory Mutual |
| IRI | Industrial Risk Insurers |
| ISO | Insuring Services Office |
| IPCEA | Insulated Power Cable Engineers Assoc. |
| ADA | Americans with Disability Act |
| NETA | InterNational Electrical Testing Association |
- B. All local codes to be incorporated.
- C. Latest adopted codes and latest editions of standards shall be the basis of conformance.
- D. Obtain and pay for all permits and inspections, and any associated charges.
- E. Inspection Agency Certificate of Inspection to be provided at completion of the work. Inspection by Middle Dept or other local inspection agency.
- F. Drawings, Contract, General Conditions and Supplementary Conditions form a part of this section, by reference thereto and shall have the same force and effect as if printed herewith in full. Failure to review these sections shall not relieve the Contractor of his responsibility to fully comply with the terms therein.
- G. Where the contract documents are more stringent but not in conflict with the applicable codes, the more stringent requirements shall be followed.

1.02 SUBMITTALS

- A. The procedure for submissions of shop drawings shall be as specified in Division 1, or as a minimum, as indicated below.
- B. Furnish submissions of shop drawings and samples of materials and equipment as indicated in these sections, on the drawings, or as directed by the A\E. Submissions will be made in a timely fashion such that adequate time exists to review the drawings, or material, and arrive at the site in accordance with the project schedule.

- C. Submissions will not be accepted with work defined as "By Others". Identify contractor by name and with his approval so indicated. Submissions are required prior to purchasing, fabrication, or installation of any material or equipment. Submissions shall be reviewed and certified by the submitting contractor that they are in accordance with the project documents.
- D. When requested by the engineer, shop drawings shall be required to be submitted to designated agencies for review and approval prior to submission to the engineer.
- E. Contractor shall arrange and pay for all tests and inspections specified herein or required by above agencies and furnish required certificate of inspection to owner.
- F. Performance test data and wiring diagrams of all electrical equipment.
- G. Submissions shall include warranties by the manufacturer for equipment being provided. Submissions for commonly related items such as fixtures, trim, carriers, shall be combined in a single brochure with all items being furnished clearly identified.
- H. Shop drawings and submittals shall be checked and stamped by the contractor before submitting. They shall conform to measurements made at the site, the contract requirements, and coordinated with all other trades.
- I. Specific models in catalog sheets must be identified as well as all options, voltages, phases, etc. identified so as to be clear on what is being provided.
- J. Contractor and manufacturers shall be responsible for all physical characteristics of the equipment and field verify with final locations, coordinate with floor plans, confirm service access, clearances, confirm equipment arrangements, electrical disconnect clearances, and pathways/travel/access to the final equipment installation locations. Submission of equipment shop drawing will be deemed evidence of compliance with this requirement. If no shop drawing is submitted, contractor shall be fully responsible for a complete installation and assumes all related costs that affects the contractor and other trades.
- K. To aid in the preparation of submittals or shop drawings, the engineer can provide the electronic files for use by the contractor. The electronic files will be provided upon execution of the engineer's electronic file release contract prepared specifically for this project. The electronic files will be released in the format used by the architect and engineer to design the project. If this file format is not compatible with the contractor's needs, additional charges for providing the changes to the requested file format may be necessary at \$150/hr billable to the contractor.

1.03 SUBSTITUTIONS

- A. Substitution of other than specified manufacturers shall not be allowed after bid date.
- B. Prior approval is required for other manufacturers. If the contractor wishes alternate materials or equipment be considered, he must submit information at least 10 days before bid date. If acceptable, an addendum will be issued which will allow the contractor to utilize the alternate.
- C. Samples shall be provided when directed by the architect or engineer.
- D. If the contractor submits alternate equipment, manufacturers, systems, methods, or materials, not specifically identified in the specifications, additional review and investigation time may be required by the engineer. If the engineer determines additional review time is required because of the substitution, then this will be a billable service by the engineer at the rate of \$150.00/hr. for such services. Also, billable will be any redesign time and revisions to drawings should they be necessary for incorporation into the work. Services will be billable to the contractor making such substitutions and will be payable prior to approval or rejection.
- E. If the contractor elects to submit alternate equipment, manufacturers, systems, methods, or materials, not specifically identified in the drawings and specifications, it is the contractor's responsibility to coordinate the work with other trades and pay for any associated costs with the substitution or change.
- F. Contractor and manufacturers shall be responsible for all physical characteristics of the equipment and field verify with final locations, coordinate with floor plans, confirm service access, clearances, confirm equipment arrangements, electrical disconnect clearances, and pathways/travel/access to

the final equipment installation locations. Submission of equipment shop drawing will be deemed evidence of compliance with this requirement. If no shop drawing is submitted, contractor shall be fully responsible for a complete installation and assumes all related costs that affects the contractor and other trades.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and equipment in manufacturer's original cartons or on skids.
- B. Store materials in dry enclosure out of way of work progress.
- C. Protect equipment, fixtures, and lenses after placement.

1.05 REFERENCE

- A. Requirements established within the portions of this Project Manual titled Division 1, General Requirements are collectively applicable to the work of this section.
- B. Instructions to Bidders, Special Conditions and Addenda as issued are part of this specification.
- C. Electrical drawings along with all other project drawings represent the work of this Division.
- D. Drawings, Contract, General Conditions and Supplementary Conditions form a part of this section,
- E. by reference thereto and shall have the same force and effect as if printed herewith in full. Failure to review these sections shall not relieve the Contractor of his responsibility to fully comply with the terms therein.

1.06 WORK SUMMARY

- A. Provide labor, materials, equipment and supervision necessary to install complete operating electrical systems as indicated on the drawings and specified herein, including all work at the site and within the proposed construction areas to accomplish the require work.
- B. Contractor shall provide all demolition necessary to remove, replace, repair, install new or modify existing work whether it be walls, floors, ceilings, structure, mechanical or electrical required to install his work. Contractor shall replace all work to leave in a finished condition. Pipe, conduit, ductwork and wiring shall be cut back behind wall surfaces above ceilings and below floor levels so that a patch can be placed over the opening.
- C. Demolition:
 - 1. Contractor shall disconnect and remove the entire existing electrical system including panels, fixtures, transformer, conduit, wiring, supports, fasteners, starters, fire alarm devices and wiring, telephone equipment and wiring, battery packs, switches, outlets and devices within the renovation area.
 - 2. Electrical contractor shall verify all existing conditions prior to commencing work.
 - 3. Remove branch circuits back to the power source or the nearest device to remain active. Restore all circuits interrupted by the demolition work to maintain circuit continuity.
 - 4. Tag all circuits which become spares as a result of demolition. Update the effected panelboard directories.
 - 5. Relocate existing branch circuits which interfere with new construction whether specifically identified or not. Refer to architectural drawings for new walls, structure, millwork, etc. which may require existing conduit, wire, etc. to be relocated.
 - 6. It is the intent that power remain active in adjacent areas during the construction. Contractor is to modify existing wiring arrangement to comply.
 - 7. All equipment and appurtenances removal are to be disposed of properly. Refer to local, state and federal requirements.
- D. All work shown on the drawings and not expressly mentioned in the specifications and all work specified but not shown on the drawings, but necessary for the proper execution of same shall be performed by the contractor. It is not the intent of the drawings and specifications to describe every

feature and detail of the work.

- E. No additions to the contract amount will be approved for any materials, equipment, or labor to perform additional work unless it can be clearly shown to be beyond the scope and intent of the drawings and specifications.
- F. Provide roof penetrations for electrical work and all associated roof work.
- G. Provide addressable fire alarm system with battery backup, (horn/strobes) (speaker/strobes), pull stations, detectors, strobes, duct detectors, remote annunciator, telephone auto dialer, fire fighter phones, and all associated controls and appurtenances.
- H. Provide fire alarm system with battery backup, horns, strobes, pull stations, annunciator panel, duct detectors, and all associated controls and appurtenances.
- I. Provide exit and emergency lighting throughout with emergency power supply in addition to normal power.
- J. Provide power to HVAC and plumbing equipment as necessary to have complete operating systems.
- K. Provide lighting throughout, with exterior lighting at all exit doors.
- L. Provide site lighting for all parking areas, roadways, walkways, as well as security lighting.
- M. Provide telephone conduit system. Provide (2) CAT 3 plenum rated telephone cables from the telephone demarcation point to the fire alarm control panel for the auto dialer.
- N. Provide Uninterruptible Power Supply System (UPS) with input filter, transformer, battery, and all associated controls and appurtenances.
- O. Provide grounding system for facility in accordance with the National Electrical Code.
- P. Provide addressable security system with battery backup, intrusion detection sensors, signal equipment, system controls, alarm displays, alarm indicating devices, telephone auto dialer, and manual keypads to change system status and associated cable and appurtenances.
- Q. Provide closed circuit television system to monitor all entrances and exits complete with monitors, cameras, tilt/pan controller, 16 channel multiplexers, cable and appurtenances.
- R. Provide communication/sound throughout complete with controller, receivers, CD/tape decks, microphones, speakers, antennae, loudspeakers, equipment racks, associated cable and appurtenances.
- S. Base bid is to provide all primary cable, transformer coils, busways, switchboards, panelboards and all feeders as copper conductors. Alternate bid is to provide all as aluminum conductors of equivalent current carrying capacity.
- T. Provide code required signage (i.e., NEC 110.34, NEC 700.8, and 695.4 B3).
- U. Provide third party certification of all packaged systems by a Nationally Recognized Testing Laboratory (NRTL) in accordance with OSHA Federal Regulations 29CFR1910.303 and .399 as well as Pamphlet #70 and National Electrical Code Article 90-7.
- V. Refer to Commissioning of Systems Specification for additional scope of work.

1.07 SITE INSPECTION

- A. Visit site, inspect, and become aware of all conditions which may affect the work. Investigate utilities, protection requirements for adjacent facilities, storage locations, and access to the construction area.
- B. Submission of a bid will be deemed evidence of having complied with this requirement. Contractor may not request additional costs for existing conditions which were evident from inspection of the site.
- C. Before ordering materials or commencing with any work, the contractor shall verify all measurements at the building. Coordination of equipment, materials, spaces, and dimensions are the responsibility of the contractor.

1.08 UTILITY CONNECTION AND CHARGES

- A. The contractor shall be responsible for coordination of the work with the Electric Utility Company.

Make arrangements in a timely fashion for connection of the service.

- B. The Electrical Contractor shall be responsible for utility connection charges, meter charges, and other installation charges as may be applied, by the local utility company.
- C. Contact the utility company during the bidding period for connection charges and include same with bid.
- D. Provide connections, terminations, hand holes, manholes, pads, transformers, vaults, conduits, wiring, and all required materials and labor as may be required by the utility company to obtain service for the facility. Any costs for service work shall be included with the bid.

1.09 DRAWINGS AND SPECIFICATIONS

- A. Drawings and specifications are intended to be taken as a whole and each is to supplement the other. It is not intended that all work must be both shown on drawings and specified in the specifications.
- B. An item shown on the drawings and not indicated in the specifications is to be understood to be required for the project. An item specified and not shown on the drawings is to be understood to be required for the project.
- C. If there is a conflict between the drawings and specifications it is to be understood that the more strict or more expensive interpretation shall govern. Also, if a conflict exists between specification sections or between drawing plans and details, it is to be understood that the more strict or more expensive interpretation shall govern.
- D. The architects or engineer’s interpretation of the documents shall be binding upon the contractor. If a question arises, the contractor shall ask for an interpretation prior to bidding and an answer shall be issued as an addendum to all bidders.
- E. If a question arises after bidding the A/E interpretation shall govern.
- F. The drawings are generally diagrammatic and necessary field coordination and adjustment must be provided by the contractor prior to installation. Such deviations to the work to allow for coordination shall be kept to a minimum and any such deviations shall be at no extra cost.

1.10 MINIMUM INTEGRATED EQUIPMENT SHORT CIRCUIT RATING:

- A. Where the contract documents indicate secondary service from the utility Company (208/120V, 3 phase or 480/277V, 3 phase) available short circuit currents including system motor contribution (amperes RMS symmetrical) at the line terminals of the UL service entrance labeled main distribution panelboard or switchboard, shall be in accordance with the following tabulation:

Service Minimum	Service Entrance	Panelboard Rating	Transformer Rating
KVA	%Z	208/120	480/277
75	1.5	14,500	10,000
112.5	1.5	22,000	10,000
150	1.5	29,000	13,000
225	1.5	43,000	19,000
300	1.5	58,000	25,000
500	1.5	96,000	42,000
750	5.5	42,200	18,000
1000	5.5	56,100	24,500
1500	5.5	85,000	37,000
2000	5.5		49,000
2500	5.5		51,000

3000

5.5

73,500

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- B. The Integrated Equipment short circuit rating of the MDP or switchboard shall meet or exceed the tabulated minimum values. This shall be construed to mean that the equipment withstands capability (bus bracing), and interrupting capacities of main and feeder devices, shall each meet or exceed the tabulated minimum values.
 - C. Service transformer ratings shall be as indicated on the drawings. If said ratings are not indicated, the contractor shall contact the engineer and/or utility company for clarification.
 - D. The only deviations from this tabulation that are permissible shall be the results of a short circuit study (if and as specified in Section 26 05 73 Power System Studies), or documented data from the utility company.

1.11 PROGRESS SCHEDULE

- A. Provide a project schedule which shall show start, sequence of each type of work, milestone schedule, and completion of each type of work, with overall completion date.

1.12 COST SCHEDULE

- A. Provide a detailed cost breakdown indicating labor and material amounts for various types of work.
- B. AIA forms are required for this submission.

1.13 OFFICE

- A. The contractor shall set up his job office (desk) where directed by the owner.

1.14 STORAGE

- A. Material shall be stored only where directed by the owner.

1.15 SANITARY

- A. The contractor will at his own expense, provide and maintain in a sanitary condition, a portable chemical toilet.
- B. Toilet will be located where directed by the owner.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All materials and equipment shall be new and in present production of major manufacturers.
- B. All materials and equipment shall be in conformance with accepted trade standards as a minimum. Where specifications exceed any minimum standard, the specifications shall govern.
- C. Reference of equipment in the singular shall be deemed to apply to as many such items as may be required to complete the work.
- D. The word "provide" means "furnish and install complete, tested, and adjusted as necessary with all accessories, circuiting, switching, lenses, mounting hardware, cover plates, hangers and supports".

2.02 FASTENERS AND SUPPORTS

- A. All work shall be securely fastened to building construction.
- B. Utilize toggle or machine bolts in hollow construction.
- C. Utilize machine screws for steel construction.
- D. Utilize expansion shields for masonry construction.
- E. Utilize lag bolts for wood construction.
- F. All fasteners shall be galvanized or plated with rustproof finish.
- G. Maximum load on fasteners shall be at a safety factor of 4 to 1 for a tested sample.

2.03 MOTOR STARTERS AND CONTACTORS

- A. Single phase manual motor starters with overloads shall be provided under the electrical portion of the work for fractional horsepower motors up to ½ HP.
- B. Polyphase motor starters and motor starters above ½ HP shall be furnished under other portions of the work.
- C. The starters in A or B above shall be installed under the electrical portion of the work.
- D. Polyphase starters shall be magnetic combination type, across-the-line electrically operated, electrically held, three pole assemblies, with arc extinguishing characteristics, silver to silver renewable contacts, 3 pole thermal bi-metallic, red run pilot light, individual phase protection, with overload heaters matched to motors installed and with 4 auxiliary contacts, Hand-Off-Auto switch, and control transformer.
- E. For single phase motors above ½ HP provide magnetic combination, single phase motor starters with overloads, non-fusible disconnect switch, red run pilot light, integral 120 volt control transformer with dual primary fusing, auxiliary contacts.
- F. Starters shall be as manufactured by G.E., Cutler Hammer, Siemens, Square D or Allen Bradley.
- G. Contactors shall be across the line, electrically operated, mechanically held 3 pole assemblies for tungsten and ballast lighting loads. Acceptable manufacturers: GE, Cutler Hammer, Siemens, Square D or Allen-Bradley.
- H. Manual motor starters without overloads in NEMA 1 enclosure equal to G. E. Type TC shall be used for the following load:
 - 1. 30 amperes or less continuous
 - 2. 1 hp or less at 120 volts
 - 3. 2 hp or less at 240 volts

2.04 MANUFACTURERS' NAMES

- A. Manufacturers' names are included herein to establish those suppliers who may provide products for this project subject to the requirements of the specifications. Although a manufacturer's name may appear as an acceptable supplier it is not understood that a standard product is acceptable. Products must also meet the technical, performance, and physical requirements of the project as well as being names in the specification. Any deviations from this must be acknowledged at bid time by the supplier and he shall be solely responsible for any and all costs associated with the application of his product in the project.
- B. A design cannot be prepared which accommodates the installation of all suppliers and is not intended to do so. If certain modifications must be made to accommodate one particular supplier's equipment it shall be considered the contractor's responsibility to arrange for such accommodations and be financially responsible for same.

PART 3 - EXECUTION

3.01 WELDING

- A. All electric power for arc welding shall be supplied by the contractor performing the work.

3.02 VEHICLES

- A. Vehicle access to the site will be as directed by the owner.

3.03 RUBBISH DISPOSAL

- A. Except for items or materials identified to be reused, salvaged, reinstalled, or otherwise indicated to remain property of the owner or tenant, demolished materials shall become the contractor's property and shall be removed, recycled or disposed from the project site in an appropriate and legal manner.
- B. Burning of debris on the site shall not be permitted. All debris, refuse, and waste shall be removed from the premises at regular intervals. No accumulation shall be permitted.

3.04 WORKMANSHIP

- A. Maintain all public walks and access ways.
- B. Erect and maintain barricades, warning signs, and other protective means as may be directed by the owner for protection of all persons and property from injury or damage.
- C. Plug or cap open ends of piping systems and conduit.
- D. Stored materials shall be covered to prevent damage by inclement weather, sun, dust or moisture.
- E. Protect all installed work until accepted in place by the owner. Protect lighting fixtures.
- F. Do not install plates, covers, and other finished devices until masonry, tile, and painting operations are complete or protect otherwise.
- G. Protect all existing or new work from operations which may cause damage such as hauling, welding, soldering, painting, insulation and covering.
- H. All devices and exposed raceways are to be plumb and true. All exposed raceways in finished areas are to be coordinated with the architect/engineer prior to installation.

3.05 SCAFFOLDING

- A. The contractor shall at his own expense, install, operate, protect, and maintain temporary services such as scaffolding, material hoists, access walks, etc., as may be required.

3.06 SITE UTILITIES

- A. The contractor may use the existing water and electric power for temporary construction needs.
- B. The owner will direct where these services may be tapped.
- C. Those services that are used during construction, but are to remain, shall be refurbished to a new condition before turning back to the owner.

3.07 CLEAN-UP

- A. Remove all visible temporary tags or labels as well as any protective coverings and wrappings from fixtures and equipment.
- B. Remove all spots, stains, soil, paint, spackle, and other foreign matter from all finished work.
- C. Remove all trash and debris from the premises.

3.08 LUBRICATION

- A. Furnish and install and maintain all required lubrication of any equipment operated prior to acceptance by the owner. Lubrication shall be as recommended by the equipment manufacturer.
- B. Provide one year's supply of lubricants to owner at date of acceptance.
- C. Verify that required lubrication has taken place prior to any equipment start up.

3.09 EQUIPMENT START UP

- A. Verify proper installation by manufacturer or his representative.
- B. Advise A/E 2 days prior to actual start up.
- C. Verify proper operation. Obtain signed statement by manufacturer or his representative that equipment is operating within warranty requirements. Submit statement to A/E.

3.10 OPERATING INSTRUCTIONS AND MANUALS

- A. Properly and fully instruct owner's personnel in the operation and maintenance of all systems and equipment.
- B. Insure that the owner's personnel are familiar with all operations to carry on required activities.
- C. Such installation shall be for each item of equipment and each system as a whole.
- D. Provide report that instruction has taken place. Include in the report the equipment and/or systems instructed, date, contractor, owners' personnel, vendor, and that a full operating and maintenance manual has been reviewed.
- E. Manual shall include all instructions on operation, maintenance, repair parts list, lubrication requirements, brochures, catalogue cuts, wiring diagrams, piping diagrams, control sequences, service requirements, names and addresses of vendors, suppliers and emergency contacts. 3 manuals shall be provided to owner.
- F. Submit manuals for review prior to operating instruction period. Manuals shall be 8 1/2" x 11" with hard cover suitably bound.
- G. Provide to the owner any special tools necessary to operate any of the equipment.

3.11 PENETRATION SEALING

- A. All penetrations of Natatorium walls, fire walls, smoke walls, and floors shall be sealed around conduits and wiring to prevent the flow of gases or smoke.
- B. The sealant shall be foamed in place between the conduit or wiring and the adjacent walls and floors with DOW Corning RTV foam or Fire Stop Caulk.
- C. All penetrations through roof structure shall be coordinated with other trades to minimize the potential for water seepage and leakage through such penetrations.
- D. When electrical boxes located on opposite side of a fire resistance rated wall assembly are within 24" horizontally of each other, both devices are to be wrapped with Spec Seal Putty Pads as manufactured by Specified Technologies, Inc. or approved equivalent.

3.12 EQUIPMENT SETTING

- A. Furnish and install as a minimum, a 4" thick concrete pad beneath all floor mounted equipment.
- B. Furnish and install as a minimum, spring vibration isolators under any equipment 10 HP and over and rubber-in-shear vibration isolation under all equipment less than 10 HP.
- C. Reinforce concrete with No. 4 rods 12' on center both ways.
- D. Pad to have 3/4" dowels into concrete at 1 per 4 square feet.

3.13 INSTALLATION MOUNTING HEIGHTS

- A. To be verified by Architect, but in general shall be as follows (top of device elevation above finished floor):

Lighting switches, controls:	3 ft. 10 in.
Duplex receptacles:	1 ft. 8 in.
Duplex receptacles over counters:	+8" above countertop
Telephone data wall plate and modular jack, desk phone:	1 ft. 8 in.
Telephone, data wall plate and modular jack, wall phone:	3 ft. 10 in.
Special outlets:	As required for equip.
Fire alarm annunciating devices:	85"
Fire alarm manual pull stations:	3 ft. 10 in.
Clock receptacles:	As indicated on dwgs.
CATV wall plates and modular jacks:	1 ft. 8 in.
CATV wall plates and modular jacks mounted near ceiling:	Coordinate mounting height with Architect.
Thermostats (forward reach):	3 ft. 10 in.
Thermostats (side reach):	3 ft. 10 in.
Thermostats with lockable cover:	4 ft. 6 in.

Requirements of the Americans with Disability Act and/or ANSI A117.1 shall be met.

- B. Structural and mechanical details shall be coordinated before roughing in.

3.14 COORDINATION

- A. Coordinate with work of other trades prior to installation.
 B. Arrange for minor variations for complete coordinated installation. Provide all necessary offsets to install the work and to provide clearances for other trades.

3.15 CUTTING AND PATCHING

- A. Provide for cutting and patching for all electrical work.
 B. Patching to be performed by tradesmen skilled in the particular trade.
 C. Contractor shall patch and repair any existing openings created by the demolition work in floors, walls, partitions, and ceilings not being reused for the new construction.

3.16 BALANCING AND TESTING

- A. Electrically balance connected loads in panels.
 B. The entire wiring system shall be tested to be free from grounds and faults.
 C. Identify all circuits and all phase wiring at terminations.

3.17 EQUIPMENT FURNISHED BY OTHERS

- A. This contractor shall make final electrical connections to equipment furnished by other contractors or the owner.
 B. Provide electrical service and disconnects as required by code to supply such equipment.

3.18 EXCAVATION, SHORING, PUMPING, BACKFILLING

- A. Perform all excavation required to install the work. Deposit excavated material as so not to create a slide hazard.
- B. Maintain excavations free of water.
- C. Backfill with clean material and pneumatically tamp in 8 inch layers. Remove excess material, including rock, from site or as directed by the A/E.
- D. Return to original conditions any areas disturbed for excavation.
- E. Install all work neat, trim, and plumb with building lines.
- F. Install work in spaces allocated.
- G. Cutting and patching shall be performed by skilled tradesmen normally employed for the work involved.

3.19 RECESSES

- A. Furnish information to the General Contractor as to sizes and locations of recesses required to install panels, boxes, grilles, and other equipment or devices which is to be recessed in walls.
- B. Make offsets or modifications as required to suite final locations.

3.20 LABELING

- A. All equipment panels, controls, safety switches, and devices shall be provided with permanent black laminated micarta white core labels with 3/8 inch letters.
- B. This shall also apply to all controllers, remote start/stop pushbuttons, equipment cabinets, and where directed by the A/E.
- C. This shall not apply to individual room thermostats, and local light switches.

3.21 GUARANTEE

- A. All work shall be guaranteed to be free from defects for a period of 1 year of operation from date of acceptance by the owner unless otherwise specified.
- B. Guarantee shall be extended for all non-operational periods due to failure within the guarantee period.

3.22 AS BUILT DRAWINGS

- A. At the completion of the work and prior to final payment, the contractor shall furnish a reproducible as-built drawing to the A/E for approval. The drawings shall indicate all work installed and its actual size, location and identify all systems installed with locations of concealed devices, conduit, piping and other equipment and complete wiring diagrams of all systems. If acceptable, the A/E will submit the as-built drawings to the owner as record drawings. If not acceptable, the A/E will return the drawing to the contractor to make corrections as required. The contractor will resubmit for approval.
- B. The as-built drawings shall indicate measured dimensions of underground lines and other concealed work.
- C. To aid in the preparation of as-built drawings, the engineer can provide the electronic files for use by the contractor. The electronic files will be provided upon execution of the engineer's electronic file release contract prepared specifically for this project. The electronic files will be released in the format used by the architect and engineer to design the project. If this file format is not compatible with the contractor's needs, additional charges for providing the changes to the requested file format may be necessary at \$150/hr. billable to the contractor.

3.23 SAMPLE CONSTRUCTION

- A. (One double and one single patient room) (one apartment) (one tenant space) shall be constructed and approved by the owner, architect/engineer, and local code officials (electrical inspector or underwriter, building code official, fire marshal) before all other rooms are constructed.
- B. This room shall represent the standard against which all others will be constructed.
- C. Installation will include all units, ducts, piping, wiring, fixtures, devices, etc. which are required for complete rooms.

3.24 MAIN ELECTRICAL ROOM DRAWING

- A. Provide 3/8" = 1'-0" scale drawings of the Main Electrical Room indicating all electrical, mechanical, plumbing, telephone, security, fire alarm and life safety equipment to be installed within this room. Exact dimensions of equipment, pads, etc., are to be indicated. Show two cross sections at important points.
- B. Obtain information from other subs as appropriate.
- C. Submit for review and approval along with electrical equipment submittals. Equipment will not be approved prior to review of this drawing.

3.25 WORK COMPLETION

- A. The contractor shall promptly correct work rejected by the engineer or failing to conform to the requirements of the contract documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected work, including additional testing and inspections and compensation for the engineer’s services and expenses made necessary thereby, shall be at the contractor’s expense.

3.26 REQUEST FOR INFORMATION (RFI) REQUIREMENTS

- A. All RFI’s shall include the following information based on AIA Document G716:
 1. To, From, Project Name, Issue Date, RFI number in sequential order with all other trades, Requested Reply Date.
 2. Provide a description with specification and/or drawing references.
 3. Provide the senders recommendation including cost and/or schedule considerations.
 4. Provide receiver’s reply space.
 5. Note an RFI reply is not an authorization to proceed with the work involving additional cost/time.

3.27 SHOP DRAWING REQUIREMENTS

- A. The following is a list of required shop drawings for this project.

ELECTRICAL	DATE REC'D	ACTION	DATE REC'D	ACTION
Basic Materials and Equipment (Section 26 05 00 and 26 27 00)				
High Voltage Cable and Equipment				
Fusible Switchboard (Section 26 24 13)				
Panelboards (Section 26 24 16)				

ELECTRICAL	DATE REC'D	ACTION	DATE REC'D	ACTION
Bus Duct (Section 26 25 00)				
Safety Switches - (Section 26 28 16)				
Automatic Transfer Switch (Section 26 36 23)				
Secondary Unit Substation (Section 26 11 16)				
Packaged Meter Centers (Section 26 27 13)				
Transformers (Section 26 22 00)				
Surge Suppression (Section 26 43 13)				
Lighting (Section 26 50 00 and 26 09 00)				
Lightning Protection (Section 26 41 13)				
Emergency Power System (Section 26 30 00)				
Static Uninterruptible Power Supply (Section 26 33 53)				
Fire Alarm and Detection Systems (Section 28 30 00)				
Low Voltage Systems (CCTV, Security, DATA, Phone Entry, etc.)				
As-Builts				
Warranties				
Maintenance Manuals				
Instructions				
Ground Test				

END OF SECTION