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260100**SCOPE & GENERAL DESCRIPTION**

- 1.0 General Description- These specifications cover furnishing all labor and materials to provide a complete and operative electrical system for Montefiore.
- 2.0 Scope - The systems described in these plans and specifications include but are not limited to the following:
 1. Branch feeder circuits.
 2. Branch panels.
 3. Alteration to emergency power system.
 4. Lighting fixtures.
 5. Kitchen equipment wiring.
 6. General purpose circuits.
 7. Individual equipment circuits.
 8. Cable television system conduit and branch outlets.
 9. Cutovers and removals of existing unused systems.

260500**GENERAL CONDITIONS**

- 1.0 Governing Conditions - General conditions of the electrical contract shall be in accordance with the "General Conditions of the Contract for the Constructions of Buildings" NSPE/ACEC-CS 156465 (latest edition) with the latest addenda and revisions.
- 2.0 Supplementary General Conditions - Supplementary general conditions may be provided for all mechanical and electrical work and are contained in the General Construction documents. This contractor should read and understand same.
- 3.0 Drawings - Work on this project as described in these specifications is shown on drawings of sheets appropriately titled and plot plan.
- 4.0 Submission of Bid - Contractor shall submit bid as directed to the owner's agent at the time specified. The bid shall contain a statement of the work to be performed and the total construction. The contractor shall state that this work is to be performed in accordance with all applicable plans and specifications.
- 5.0 Investigation of Conditions - The electrical contractor shall visit the site of the work and familiarize himself with all available information concerning the nature of local conditions bearing on transportation, handling and storage of materials. The electrical contractor shall make

his own estimate of the facilities needed and difficulties attending the execution of the contract, including local conditions, availability of labor, uncertainties of weather, transportation and other conditions bearing on transportation, handling and storage of materials.

- 6.0 Contractual Relationship with Owner - Upon award of this contract, the contractor shall save harmless the owner and his agents from any and all causes of action arising out of this contract.
- 7.0 National Electrical Code - Entire installation shall be made in accordance with the latest edition of National Electrical Code. Contractor shall cooperate with NEC inspector on the installation.
- 8.0 Field Measurements - The electrical contractor shall verify in the field, all measurements necessary for his work and shall assume responsibility for their accuracy.
- 9.0 Temporary Power and Lighting Service – This contractor shall install, maintain and remove temporary electrical service for lighting and power for construction purposes. If during the course of this project it is necessary to interrupt electric lighting or power service, this contractor shall provide temporary power and lighting as required and directed. Existing lighting and power may be interrupted only upon written consent of the owner, after 48 hours notice.
- 10.0 Existing Systems and Equipment – Portions of existing services, cables, conduits, panels or equipment may be reused and/or altered. See drawings for details.
- 11.0 Tests and Energizing - After the electrical installation is complete, this contractor shall test all circuits, busses and equipment and verify to ensure that they are free from grounds and short circuits before energizing. All 600-volt cable shall be tested using megohmmeter. Cables of higher voltage rating shall be tested using a D.C. high potential tester. Equipment shall be energized only after said tests have been conducted and test results evaluated.
- 12.0 Other General Conditions -
 1. Intent - It is the intent of these plans and specifications to provide alterations and/or new construction as indicated on the drawings and in the specifications to provide complete systems in every respect, capable of operating as designed. It is not intended that every fitting, minor detail or feature be shown on drawings. The contractor shall be responsible for any detail necessary for completion of these systems in accordance with good practice. Installation shall be executed so as to contribute to efficiency of operation, minimum maintenance, accessibility and sightliness. The installation shall conform and accommodate itself to the building structure, its equipment and its usage. No piping or equipment shall be installed in such a manner as to interfere with the operation of any doors or windows. Requirements specified herein shall govern applicable portion of mechanical and electrical sections whether so stated herein or not.
 2. Regulations and Certificates - All work shall be done in strict accordance with rules and regulations of local and state authorities having jurisdiction over such work, utility companies operating where apparatus is being installed, National Fire Protection Association, IEEE and insurance companies. Where discrepancies occur between above regulations and these plans and specifications, requirements

of the regulations shall take precedence, except that these specifications shall be minimum requirements and that no changes shall be made without approval of the engineer. Complete approval of all above mentioned authorities shall be secured and their certificates of approval shall be delivered to the owner before final acceptance. Any and all drawings or documents required (in addition to contract drawings) shall be furnished in order to secure above-mentioned approvals.

3. Drawings and Measurements - Contract drawings for mechanical and electrical work are in part diagrammatic, intended to cover the general design and extent of the systems and indicate general arrangement of equipment, ducts, conduits, piping and approximate sizes and locations of equipment and outlets. Drawings are not intended to be scaled for roughing-in measurements nor to serve as shop drawings. Where drawings are required for these purposes or have to be made from field measurements, they shall be prepared by the various trades and coordinated by the contractor. Where job conditions require reasonable changes from indicated locations and arrangements, such changes shall be made without cost to the owner. Exact locations of all grilles, registers, plumbing fixtures, electrical fixtures, panelboards, etc., shall be governed by plans, elevations and details.
4. Record Drawings - During the course of construction the respective contractor shall keep a careful record (in drawing form) of all deviations from the work as shown on the contract drawings on the installation of pipes, ducts, electric outlets, equipment, invert elevations, etc. These drawings shall be delivered to the engineer before the final certificate of payment is issued.
5. Accessibility - Locate all equipment which must be serviced, operated or maintained, in fully accessible position. Equipment shall include but not be limited to valves, traps, cleanouts, motors, controllers, drain points, etc. Furnish access doors where required. Minor deviations from the drawings may be made to allow for better accessibility, but changes of magnitude or which involve extra cost shall not be made without approval.
6. Access Doors and Panels - Furnish flush type door or panel with metal frame for all junction boxes or apparatus located in chases, walls or floors. Finish shall be prime coat.
7. Quiet Operation - All work shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the engineer. In case of moving machinery, sound or vibration noticeable outside of room in which it is installed or annoyingly noticeable inside its own room will be considered objectionable by the engineer shall be corrected in approved manner by the contractor at the latter's expense.
8. Covering of Work - No pipe fittings or other work of any kind shall be covered up or hidden from view before it has been examined or approved by the engineer or other authority having jurisdiction. Any unfaithful or imperfect work or material which may be discovered shall be removed and corrected immediately before

being condemned, and other work and materials shall be furnished which shall be satisfactory to the engineer.

9. Guarantee - The electrical contractor shall guarantee all workmanship, materials, performance for a period of one year from the date of the certificate of completion and acceptance of his work. The contractors shall promptly correct any defects upon notice from the owner to do so, without cost to the owner.
10. Waterproofing - Where any work pierces waterproofing, the installation shall be as approved by the engineer. The electrical contractor shall furnish all necessary sleeves, caulking and flashing as required to make the openings absolutely watertight.
11. Fire Stopping-All penetrations through fire and smoke rated walls, floors and ceilings shall be thoroughly sealed with 3M brand Fire Barrier CP25WB latex based caulk, or approved equal. Install in accordance with manufacturer's instructions.
12. Equipment Returns – As part of this contract, contractors shall ensure that suppliers of any and all equipment supplied for this project agree to accept the return of any equipment on this project that is in undamaged condition and has not been put into service with a maximum restocking fee of 25%, up until the date of certified substantial completion of the project.
13. Coordination of Trades – It is understood that coordination between all of the trades on this project is the responsibility of the construction manager (if any), the general contractor (if any) and the trades themselves. This coordination will include meetings and discussions as needed among the parties noted above, and preparation of coordination drawings as needed. The cost of this coordination work shall be included in the contractors' bids. It is not the responsibility of the engineer to perform this coordination. No extra charges will be paid to any contractor that is due to additional work being performed due to lack of coordination between the trades.
14. Building Services Shutdowns – All building services shutdowns, including electric, gas, water, and telephone utilities, and HVAC, sprinkler, and plumbing systems in existing buildings, for the purpose of performing cutovers and tie-ins of new systems, shall be strictly coordinated with the appropriate utility companies and the building owner. For work in existing buildings, it will be required to perform this work outside of normal building operation hours and the cost for this is to be included in the bids.

260800 CODES, PERMITS AND INSPECTIONS

- 1.0 Applicable Codes - The entire installation shall conform to the rules and regulations of the following parties having jurisdiction:
 1. National Electrical Code of the National Fire Protection Association, latest edition.
 2. State Codes, Local Electrical Codes and other regulations of municipality.
 3. Telephone company standards.
- 2.0 Permits - Contractor shall obtain all permits required by local utility company ordinances. Contractor shall cooperate with utility companies on electric and telephone installations. Contractor shall obtain approval of all utilities on service entrances.
- 3.0 Certificate of Inspection - Upon completion, the electrical contractor shall furnish a certificate of final inspection to the owner covering all electrical installations in these plans and specifications in his contract. The cost of said inspection shall be borne by the contractor and shall be included in the contract amount.
- 4.0 Laws, Ordinances and Fees - This contractor shall give all necessary notices, obtain all permits, and pay all taxes, fees and other documents and obtain all necessary approvals of all local, County, Connecticut Departments, having jurisdiction; obtain all required Certificates of Inspection for his work and deliver same to the engineer before request for acceptance and final payment for the work. This contractor shall include in the work, without extra cost to the owner, any labor, materials, services, apparatus, drawings (in addition to contract drawings and documents) which are necessary in order to comply with all applicable laws, ordinances, rules and regulations whether or not shown on drawings and/or specified. With submission of bid, the electrical contractors shall give written notice to the engineer of any materials or equipment believed inadequate 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 this contractor has included the cost of all required items in his proposal, and that he will be responsible for the approved satisfactory functioning of the entire system without extra compensation.
- 5.0 O.S.H.A. - All work on this project shall be accomplished in accordance with Federal statutes such as the Occupational Safety and Health Act (1970).

261000 MATERIALS, WORKMANSHIP AND GUARANTEE

- 1.0 Materials Standards - All materials shall be new and comply with the best accepted industry standards and shall bear the Underwriters' Laboratories (UL) seal of approval. All material shall be of such quality and dimensions specified and shall be manufactured in accordance with American Standards Association, National Electrical Manufacturers Association, I.E.E.E., and Underwriter's Laboratories. In any conflict, the engineer shall be sole judge of whether or not these conditions are met or whether the "or equal" clause is met. All conductors on entire project shall be copper. Abbreviations in the plans and specifications may be used as follows:

EMT - "Electro Metallic Tubing" - Thin wall conduit.

GIC - "Galvanized Iron Conduit" - Heavy wall conduit.

PVC - "Polyvinyl Chloride" - Schedule 40 or 80 conduit as specified.

Samples - Contractor may be required to submit sample of all materials used to the engineer. Materials may be rejected any time during project if installed without presenting samples, if found to be not equal to the quality specified in its category. The engineer shall be the sole judge of this matter.

- 2.0 Appearance of Work - All work shall be executed to present a neat mechanical appearance and leave the installation in proper operating order.
- 3.0 Guarantee - The contractor shall replace any work or material which develops defects from ordinary wear and tear within one year of the date of the final certificate of approval. Replacement shall be made without cost to the owner.
- 4.0 Layout, Cutting and Patching - The electrical contractor shall layout all conduits, box locations, etc., in advance of pouring concrete or installation of walls. Any cutting or patching required because of the contractor's neglect to properly lay out the work shall be performed at the expense of the contractor and shall be approved by the engineer to assure a workmanlike job. Contractor shall verify all dimensions shown on plans and shall be responsible for dimensions and conduit sizes to assure adequate sizing where larger conduits are installed to provide for more than one circuit per conduit. Contractor shall cooperate with other contractors on locations of facilities where conflicts of location arise.
- 5.0 Shop Drawings and Samples - Before ordering material shipped to the job, submit to engineer six copies of shop drawings for review giving all details, dimensions, etc., of the following equipment:
- Light Fixtures
 - Conduit and Wire
 - Fire Alarm Equipment
 - Lighting Controls

Electrical contractor shall also furnish samples of wire, cable, plug receptacles, light switches, disconnect switches and other small parts as requested by the engineer.

- 6.0 Rigid Steel Conduit and EMT - All rigid steel conduit shall be full weight standard i.p.s. galvanized or Sheradized threaded conduit equal to National Electric Products Company "Sheraduct" or approved equal, and no conduit smaller than 3/4" in size shall be used on any part of the installation. Rigid steel conduit shall be used in floor slab and on all main feeders to light panels, power panels, etc. All conduits, where located in outside walls, underground or underfloors, shall have joints redlead. Conduits buried underground, chased in roof planking or in slab on grade shall be painted with two coats of asphaltum paint. Conduits shall be continuous from outlet to outlet, and from outlets to cabinets, junction or pull boxes and shall enter and be secured to all boxes in such a manner that each system shall be electrically continuous from service to all outlets. Terminals of all conduits shall be furnished with double locknuts and bushings. Changes in direction of conduit where concealed shall be made by means of standard radius bend, and where exposed by means of Crouse-Hinds or equal galvanized or sheradized threaded condulets. Armored cable shall be used only for short connections to fractional horsepower utility motors. Electrical metallic tubing may be permitted on exposed ceiling work and for concealed branch circuit wiring where not installed in slab construction.
- 7.0 Junction and Pull Boxes - Junction or pull boxes shall be furnished and installed under this section of the specifications where indicated on the drawings, wherever else such a box may be deemed necessary to facilitate the pulling or splicing of wires or cables. All such boxes must be accessible and shall be built only from approved detail working drawings. Conduits shall enter these boxes through tight fitting clearance holes. Covers for the boxes shall be designed for quick removal. Where junction boxes are required for splicing box for special recessed fixtures, consult the engineer before installing and determine exact location of each box. Each feeder passing through a pull box shall be tagged with tag of fireproof material, or designated in another approved manner. Generally, junction boxes and pull box shall not be exposed in finished spaces. Where necessary, reroute conduits or make other arrangements to meet approval of engineer.

264200 PANELS AND APPURTENANCES

- 1.0 Description of System – System shall consist of three phase, four wire circuit breaker panels located as shown.
- 2.0 Description of Panels – Panels are described on drawings. Number of spare breakers and space allowed for future expansion is shown on one-line drawings. Contractor may substitute equal equipment to that specified provided breakers have equal interrupting rating, NEMA class rating and approval is given by the engineer. All panels shall be furnished for the voltage, capacity and interrupting rating required. Branch panels installed shall be Square 'D' or approved equal and shall be properly braced to with stand short circuits equal to the circuit breaker interrupting rating. All panelboards shall be dead front safety type equipped with thermal magnetic molded case circuit breakers of frame and trip ratings as shown on schedule. Bussing Assembly and Temperature Rise Panelboard bus structure and main lugs or main breaker shall have current ratings as shown on the panelboard schedule. Such rating shall be established by heat rise tests with maximum hot spot temperature on any connector or bus bar not to exceed 50 degrees C rise above ambient. Heat rise test shall be conducted in accordance with Underwriters' Laboratories Standard UL 67. The use of conductor dimensions will not be accepted in lieu of actual heat tests. All bus bars shall be copper.

Circuit Breakers – Circuit breakers shall be equipped with individually insulated, raced and protected connectors. The front face of all circuit breakers shall be flush with each other. Large permanent individual circuit members shall be affirmed to each breaker in a uniform position (or equip each breaker with a circuit card holder and neatly printed card identifying the circuit). Tripped indication shall be clearly shown by the breaker handle taking a position between “ON” and “OFF”.

Integrated Equipment Rating – Each panelboard, as a complete unit, shall have a rating equal to or greater than the integrated equipment rating shown on the panelboard schedule on the plans. Such rating shall be established by test with the circuit breaker mounted on the panelboard. The short circuit tests on the circuit breaker and on the panelboard, structure shall be made simultaneously connected to its rated voltage source. Method of testing shall be per pro-ratings. The source shall be capable of supplying the specified panelboard short circuit current or greater. Test data showing the completion of such tests upon the entire range of distribution and power panelboard to be furnished shall be submitted to the engineer, if requested by him, with or before the submittal or approval drawings. Testing of panelboard circuit breakers for short circuit rating only with the breaker individually mounted is not acceptable. Also, testing of the bus structure by applying a fixed fault to the bus structure alone is not acceptable. Cabinet Panelboards shall be listed by Underwriters’ Laboratories and shall bear UL label.

- 3.0 Wiring Method – All panel feeders shall be copper THWN or THHN insulated in galvanized conduit as shown on one line drawing from main service to all panels. Install conductors in said conduit as shown. Conduit type shall be as designated on one line diagram.

264400 INDIVIDUAL EQUIPMENT CIRCUITS

- 1.0 Description and Location - Install all individual equipment circuits as shown on drawings.
- 2.0 Wiring Method - Install all individual equipment circuits with Type THHN copper conductors in conduit. Type MC (BX) insulated copper conductors may be utilized for drop whips from junction box to device, unless otherwise noted. Connect and test. Furnish and install all wiring and furnish and install disconnect switches on equipment furnished and installed by others.
- 3.0 Mechanical Equipment - Electrical contractor shall furnish and install all power wiring, disconnect switches and connections as required to all mechanical equipment spaces to fans, air handlers, etc., as shown on drawings. Electrical control systems of all HVAC and plumbing equipment shall be furnished by respective contractors. Respective contractors shall hire, as necessary, licensed electricians to perform control work requiring same. Motor starting shall be furnished by respective contractors for installation by Electrical Contractor.

264600 GENERAL PURPOSE BRANCH CIRCUITS

- 1.0 Description - Install general-purpose branch circuits as shown on one-line diagrams on plan.
- 2.0 Wiring Method - All general purpose branch circuits shall be installed as shown on drawings. Conductor and conduit sizes are shown on drawings. No wire size smaller than #12 AWG copper shall be used. No conduit smaller than 3/4" shall be used. All boxes shall be 4" square or larger and minimum depth of 1-1/2". All conduits and boxes shall be concealed in all areas except mechanical rooms, pipe tunnel and storage areas. Metallic armored cable may be used at locations shown on drawings and for whips to branch devices. All circuits installed in floor slab shall be rigid galvanized iron conduit. All conduits installed in or below any concrete shall be rigid galvanized iron conduit and coated with "Bitumastic". All junction boxes shall be sized as shown on drawings or as per N.E.C. requirements. Provide swing cover or screw as shown or dictated by usage. All junction boxes shall be code grade steel galvanized. All junction boxes shall be accessible. Electrical contractor is required to provide and install access doors or panels for same unless otherwise noted. It is noted that the hereinbefore-described wiring method is applicable to various other signal systems as well as general purpose circuits as herein described.

Location of Outlets - Locate outlets as shown on drawing. Contractor shall cooperate with other trades in conflict of locations. Except as otherwise specified on drawings, centerline height of outlets above floorline shall be as follows:

Bracket Outlets	6'-6"
Wall Switches	4'-0"
Clock Outlets	7'-0"
Convenience Outlets	3'-8"
(Counters)	
Convenience Outlets	1'-6"

See plans for locations of other lighting and power outlets.

- 3.0 Control of Circuits - Circuit control shall be provided as shown on drawings. Where no switches are shown on the drawings, the breaker switch in panel shall be used as the switching means, and shall be of the switching duty type.
- 4.0 Wiring Devices - Shall be as listed in legend and schedule described on drawings.
- 5.0 Connections - All connections shall be made using Buchanan Compression Type connectors or equal, using nylon or P.V.C. insulators.
- 6.0 Plates - All switches, receptacles and wiring device plates shall be in coordination with owner/architect. Furnish and install same as directed.

265000 LIGHTING AND EQUIPMENT

- 1.0 Description and Guarantee - Contractor shall furnish and install all lighting equipment as shown on the drawings and as contained in these specifications. All material shall be NEMA standard manufactured and shall be Underwriters Laboratories approved and shall bear that seal of approval. Contractor shall furnish and install all lamps of types and sizes as described on plans in the schedule of electrical equipment to the maximum size permitted by the fixture design. Equipment shall be tested and rendered operative by the contractor.

- 2.0 Lighting Fixture Schedule - The contractor shall furnish and install the lighting fixtures complete for each and every light outlet in the type, quality and size of fixture indicated on plans and as described in the schedule. It shall be the responsibility of the contractor to check the plans with the schedule for completeness, as this schedule is made up for the purpose of indicating the general type, quality and size of fixtures that will be required. The use of catalog numbers describing a fixture does not necessarily include all the required accessories that may be required for a complete installation. The use of a vendor's name and catalog is for convenience in specifying the quality, style, size, finish and general type of fixture required and does not intentionally exclude similar equipment available from other manufacturers. This contractor shall include all fixtures, wiring, hanging, uncrating, connecting up, and making ready to operate. All fixture wire for fixtures shall be not less than #12 gauge, but larger if capacity of fixture requires it. All splices shall be pressure type connectors as hereinbefore described. Contractor shall include the cost of furnishing and installing all lamps for all fixtures under this contract throughout. All lamps for all fixtures shall be furnished in type specified. The engineer reserves the privilege of having samples specified lighting fixtures mounted in place in operating condition for evaluation prior to final approval. In the event any fixture type is rejected for aesthetic or other reasons, the contractor shall procure and install other suitable fixtures as directed until a satisfactory approval is granted. Any difference in cost of fixtures thus approved shall be mutually agreed upon before installation, but all work involved in sample installations and final approval by the engineer shall be at no additional expense to the owner.

- 3.0 Installation of Lighting Fixtures - Fixtures shall be completely wired in accordance with the latest requirements of the National Electrical Code. All pendant type fixtures in the same room shall be installed at a uniform height from the floor and hang plumb. Fixtures shall be rigidly mounted in fixture stud in outlet box. Malleable iron hickies or extension pieces shall be provided where required. Each lighting fixture unit shall be installed in a manner approved by the manufacturer using a fastening method approved to sustain three times the weight of each unit. Use only stems, fittings and appurtenances provided by same fixture manufacturer. All suspended units where used with suspended ceiling shall be suspended from a structural portion of building and shall not be dependent upon ceiling for support. Contractor shall furnish and install all miscellaneous materials required to install lighting fixtures. Provide and install suitable cover plates or canopy for fixture outlet box where the fixture does not provide a suitable cover. Fixtures located on exterior of building shall be installed with cadmium-plated brass screws. Electrical contractor shall confer with the general contractor to locate and install pendant-ceiling fixtures and install supports for any ceiling fixtures which require special provision for their support. Installation of all lighting fixtures shall be done by experienced mechanics. Lighting fixtures shall not be installed until finished coat of paint has been applied to ceilings and walls and allowed to dry thoroughly. Lighting fixtures in the equipment rooms shall not be installed until all piping and ductwork is in place. Lighting fixtures layout shown on plans is typical layout for bid purposes but must be modified by the contractor to provide adequate lighting of the equipment space according to final construction conditions. Any relocation of fixtures due to

duct or piping interference shall be as directed by Architect, at the expense of the contractor and not billed to the owner.

265200 EMERGENCY LIGHTING SYSTEM

- 1.0 Description-The contractor shall furnish and install emergency lighting system as shown on plans and as follows; 12-volt emergency lighting units featuring lead calcium or nickel cadmium type batteries allowing up to 10 years without maintenance.
- 2.0 Battery/Charger - Batteries shall carry a minimum 10-year pro-rata guarantee. The charger shall constantly maintain battery at full charge during normal operation. Upon interruption of normal AC power, the transfer circuit shall automatically switch the DC load to battery providing emergency lighting. When normal power is restored, the load shall switch off and charger recharge battery to its initial state for next emergency. Charger and controls in units shall be fully automatic solid state of modified constant potential type designed to recharge in 12 hours of maximum load AC-0.7 amps in high rate. Charge rate pilot light shall indicate both AC input and state of charge. Test switch shall check transfer function and DC lamps. Cabinet construction shall be of 18 gauge CRS with baked-on bronze hammertone finish. Shall mount directly to wall by means of two keyhole slots.
- 3.0 Fixtures, Wiring and Installation-Equipment shall be as shown on plans. Construction shall be high-impact, heat resistant Lexan with fully adjustable swivel for remote mounting or unit equipment mounting. Units shall be supplied for conduit connection as standard knockouts for concealed entry. DC load fusing in compliance with UL 294 shall be supplied as standard, where required. Charger shall also be supplied with brownout sensitive circuit to connect load to battery when AC input falls to 35% of supply voltage.

266000 ELECTRICAL CONNECTIONS TO HVAC AND PLUMBING EQUIPMENT

- 1.0 General - This contractor shall do all power wiring required for plumbing, ventilating and heating motors and pumps including mounting of switches and starters, as well as wiring of same. Electrical contractor shall furnish one manual thermal starter with all motors less than ½ HP; magnetic across-the-line starters will be furnished by respective contractors on unitary equipment.

Respective contractors refers to the contractor providing the equipment which requires control and power connections.

- 2.0 Overcurrent Protection and Disconnect Switches. The contractor shall furnish and install overcurrent protection and disconnecting means as required by NEC for all motors. Motor driven equipment specified under plumbing and HVAC sections may be factory wired complete with controller motor disconnects; therefore, this contractor should check equipment purchased under these sections to avoid duplication of protective and disconnecting means. This contractor shall connect, ready for operation, motors and control apparatus specified under other sections unless specifically mentioned as being connected under such section. Each motor shall be provided with an enclosed safety switch having quick-make and quick-break contacts. The disconnecting switch shall open all ungrounded conductors simultaneously and shall have a rating equal to, or in excess of the motor control. Where manual control is called for in addition to automatic control, provide HAND-OFF-AUTO control. Each motor protective device shall be calibrated or selected for its rated capacity. NOTE: Heating and other contractors shall furnish, FOB, premises, the electrical magnetic switches for installation and connection by electrical

contractor as indicated on the plans. Where more than one motor is wired to a single circuit, each motor shall be provided with a thermal protective switch.

- 3.0 Thermal Protection-Starters with thermal protection for motors will in general be furnished under the other sections of the specifications. Thermal elements are specified in these sections to protect all motors at 100% of the nameplate readings. Where the protection does not comply with the specifications the equipment supplier will be notified to have the thermal elements changed.

267200 FIRE ALARM SYSTEM

- 1.0 Description of System - Furnish and install a completely supervised detection and fire alarm system, as manufactured by Simplex, Edwards, Fire Lite, or equal. The system shall contain battery back-up power to operate the system in case of power outage. The battery unit shall be provided with battery charger with a trickle charge feature. The system shall conform to the following National Fire Protection Association Bulletins:
1. NFPA-70 National Electrical Code, latest edition.
 2. NFPA-101 Life Safety Code.
 3. NFPA-72 latest edition.
 4. All work to be performed by qualified personnel of the contractor experienced in such work.
- 2.0 Wiring - Electrical service for equipment shall be connected to the supply side of the service disconnect. Minimum wire size shall be as recommended by equipment manufacturer. (No wire smaller than 18-gauge will be approved). Use UL listed wire only. All wiring shall be concealed in walls or in conduit where exposed at the ceiling.
- 3.0 Drawings - See drawings for equipment location. Drawings are schematic. Exact locations to be approved by architect in field before installation.
- 4.0 Equipment - The system components shall be as indicated on plans.
1. Strobes and horn strobes shall be ADA compliant and shall be installed to comply with same.
 2. Pull stations shall be dual action type.
 3. Smoke detectors shall be photoelectric.
 4. Duct smoke detectors shall be ionization type with full-length sampling tube.
 5. Fan shutdown shall be provided on all air handling systems greater than 2000 cfm.
 6. The annunciator panel shall be located at the main entrance visible to the exterior, where possible.

5.0 Mounting, Instructions and Checkout -

1. Securely mount all devices.
2. Provide instructions and maintenance manual for entire system.
3. Complete systems shall be tested and operation shall be demonstrated before final acceptance. Provide separate circuit from panel shown to battery charger unit. All wiring shall be permanently connected to unit.

Entire system shall be installed with separate wiring from other system of the building.

267400 TELEPHONE SYSTEMS

- 1.0 Description of System - This Electrical Contractor shall furnish and install a system of raceways for use of supplying Telephone Company and private owner or tenant hired telephone systems installers in order to provide facilities for the installation of a complete and operative telephone system.
- 2.0 Wiring Method - Methods shall consist of but not be limited to:
 1. Telephone terminator board (T.T.B.) 4' x 8' in telephone entrance closed, painted 2 coats AIA grey.
 2. 1-20A dedicated duplex receptacle mounted to lower left corner of TTB.
 3. Ground conductor at telephone service entrance.
 4. Pull line or telephone wires as directed in each telephone outlet location as shown on plan.
- 3.0 Relationship with Telephone Company - This electrical contractor shall perform to the following:
 1. Communicate with franchised telephone company and conform to all requirements for telephone service installation.
 2. Cooperate with owner's interconnect telephone company in use of specified conduit system selected by owner.
 3. Cooperate with all telephone installers on location of conduits, boxes and fitting up of systems and final details such as plates, etc.

269000 CUTOVERS AND REMOVALS

- 1.0 Cutover - Contractor shall arrange to cutover from existing to new equipment to minimize outage to equipment in service. Contractor shall advise the owner as to proposed time of cutover.
- 2.0 Removals - The contractor shall remove existing electrical feeds upon completion of cutover.

269200 COMPLETION OF WORK

- 1.0 Testing - Completed installation shall be tested. Cable shall be tested with ohmmeter for grounds, opens, insulation resistance. Cable insulation resistance shall be in the megohm range in the category required by I.P.C.E.A. for the cable.
- 2.0 Acceptance - In the presence of engineer and owner, demonstrate operation of systems and that all specifications have been met to the satisfaction of the owner.
- 3.0 Miscellaneous - Provide all miscellaneous spare parts, devices and appurtenances as required. Install and test.
- 4.0 Close Out -
 1. Contractor shall provide 2 copies of all O&M manuals, warranty and catalog cut data in a 3 ring binder, neatly arranged, to the owner prior to application of final payment. Binder shall be acceptable to owner and engineer prior to approval of final payment.
 2. Demonstrate to building maintenance personnel correct preventive and schedule maintenance services.
 3. Provide warranty to owner, including points of contact for warranty work for system installation and manufacturers equipment installed.

Final payment will not be released until contract closeout is complete.