PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The Bidding Requirements and Contractual Requirements of Division 01 shall apply to all work hereunder.

B. Bidders of work in Sections under Division 26 are expected to have read the above requirements and, upon subcontracting for work called for in such Sections, shall be responsible for compliance with such Sections.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

All work under Division 26 shall comply with requirements of Department of Education (DOE) of the State of Florida, State Requirements for Educational Facilities (SREF), and to other pertinent codes made a part of such code by reference.

1.03 INTENT

A. It is the intention of these specifications and drawings to call for finished work, tested, and ready for operation. Wherever the word "provide" is used, it shall mean "furnish and install complete and ready for use."

B. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.

1.04 SURVEYS AND MEASUREMENTS

Base all measurements, both horizontal and vertical from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as related to the work. All material take-offs for the site shall be field measured prior to bids.

1.05 DRAWINGS

1. Drawings are diagrammatic and indicate the general arrangement of systems and work included in the contract. Drawings are not to be scaled. The architectural drawings and details shall be examined for exact location of fixtures and equipment. Where they are not definitely located, this information shall be obtained from the Architect.
2. If directed by the Architect or Engineer, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.
3. At the time of each shop drawing submission, the Contractor shall call the Engineer's attention (in writing) to, and plainly mark on shop drawings, any deviations from the Contract Documents.
4. At the close of the job, prior to final review, five (5) bound copies of the following shall be submitted by transmittal letter to the Engineer for review and acceptance.
5. Equipment warranties
6. Contractor's warranty
7. Parts list and manuals for all equipment
8. Operating Instructions (in writing)
9. Written instructions on maintenance and care of the system

1.06 REFERENCES

1. ANSI/NFPA 70—National Electrical Code
2. State Requirements for Educational Facilities (SREF)
3. SREF—Florida Building Code Section 453
4. NFPA 101—Life Safety Code
5. Florida Department of Education Accessibility Guidelines and Requirements
6. Florida Fire Protection Code

1.07 SUBSTITUTIONS

A. The intention of the terms of these Contract Documents is for the Contractor to furnish and the School District to receive the exact materials and equipment specified in (a) the originally published Specifications and Drawings or, (b) as previously specified in any addendum issued by the Project Architect/Engineer (PA/E) during bidding and prior to bid opening.

B. Therefore, it is the intention of the Project Architect and Engineers to prohibit substitutions after the time of bid opening. Manufacturers and others with interests in providing materials or equipment other than that originally specified have ample opportunity to request inclusion up to ten (10) days before bids open. See the following in Division 01:

1) Division 01, Instructions to Bidders

2) Division 01, Supplementary General Conditions

C. The limited conditions for which a substitution may be considered are set forth in the above listed articles/paragraphs. Substitutions on any other basis will be considered not in the School District's best interest and as non-competitive.

D. The Project Architect/Engineer, on advice of the Electrical Engineer, shall turn down appeals for substitutions after the award of the Contract and the School District's representative, the Facilities Design & Construction Office’s representative, will not entertain such requests.

E. Contractor options:

1) For products specified only by a referenced standard, such as ASTM, ANSI, etc., select any product meeting that standard.

2) For products specified by naming several products or manufacturers, select any one of the products or manufacturers names, which complies with the Contract Documents. To comply, a product must be acceptable to the Facilities Design & Construction Representative and the Project Architect/Engineer in quality, performance, space requirements and maintenance requirements. This Contractor must prove product acceptability.

3) For a product specified by naming only one product and manufacturer, there is no option.

4) When products are provided as an option if this Contractor selects an option, this Contractor shall be responsible for modifications required for his work and work of other trades at no additional cost to the Owner.

F. Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality and performance required. The drawings are based upon equipment scheduled on drawings and specified. If another manufacturer is considered substitution during the bidding process, the Electrical Contractor shall be responsible for coordinating all electrical, mechanical, structural, or architectural changes. Comparable equipment manufacturers which are listed as equals shall be considered as substitutes. Manufacturers other than the basis of design shall submit a catalog information and 1/4" scale plan and section drawings showing proper fit and all clearances for maintenance items.

G. Substitutions of other manufacturers will be considered for use if, in the Engineers opinion, the item requested for substitution is equal to that specified. The Contractor shall provide to the Engineer a typed comparative list of the basis of design and the proposed substitute.

H. Request for approval of substitutions or equals prior to bid must be made in writing. The approval of any substitutions or equals prior to bid shall not be construed as a shop drawing approval. The substitute or equal must be submitted as described in the specifications and meet all the requirements of the specifications and drawings.

I. All requests for substitutions shall be submitted as described in Paragraph 1.07, G., and specifically indicate any and all differences or omissions between the product specified as basis of design and the product proposed for substitution.

J. Where the Contractor proposes to use an item of equipment other than that specified or detailed on the drawing, which requires any redesign of the structure, partitions, foundations, piping, wiring, or any other part of the mechanical or electrical, all such redesign, and all new drawings and detailing required therefore, shall be prepared by the Subcontractor at his own expense and submitted to the Architect/Engineer for approval.

K. Where such approved deviation requires quantity and arrangement of equipment from that specified or indicated on the drawings, any other additional equipment required by the system, shall be provided by this Contractor at no additional cost to the Owner.

L. Dry-Type Transformers (Section 26 22 13), Motor Control Center (Section 26 24 19) Distribution Switchboards (Section 26 24 13), Panelboards (Section 26 24 16), Disconnect Switches (Section 26 28 16), and Enclosed Motor Controllers (Section 26 29 13) shall be of the same manufacturer.

1.08 SUBMITTALS

A. Submit under provisions of Division 01.

B. Proposed Products List: Include Products specified in the following Sections, but not limited to:

1. Section 26 05 33.13 Conduit and Raceways
2. Section 26 05 33.23 Surface Raceways
3. Section 26 09 19 Contactors
4. Section 26 22 13 Dry Type Transformers
5. Section 26 24 16 Panelboards
6. Section 26 24 19 Enclosed Motor Controllers
7. Section 26 27 16 Cabinets and Enclosures
8. Section 26 27 26 Wiring Devices
9. Section 26 27 16 Cabinets and Enclosures
10. Section 26 28 16 Disconnect Switches
11. Section 26 43 00 Surge Protective Devices (SPD’s)
12. Section 26 43 13 Surge Protectors for Data and Electronic Equipment
13. Section 26 51 13 Luminaires
14. Section 27 13 00 Structured Cabling
15. Section 27 53 13 GPS Wireless Master Clock System

C. It shall be understood that review of shop drawings by the Engineer does not supersede the requirement to provide a complete and functioning system in compliance with the Contract Documents.

D. Samples, drawings, specifications, catalogs, submitted for approval, shall be properly labeled indicating specific service for which material or equipment is to be used, location, section and article number of specifications governing, Contractor's name, and name of job. All equipment shall be labeled to match labeling on contract documents.

E. Catalogs, pamphlets, or other documents submitted to describe items on which approval is being requested, shall be specific and identification in catalog, pamphlet, etc. of item submitted shall be clearly made in ink. Data of a general nature will not be accepted.

F. Approval rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are approved, said approval does not mean that drawings have been checked in detail; said approval does not in any way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the contract drawings and specifications.

G. All shop drawings shall be submitted to the Architect/Engineer by Contractor no later than thirty (30) days from the day of contract award.

H. 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.

I. Submit all Division 26 submittals at one (1) time in one (1) integral group. Piece- by-piece submission of individual items will not be acceptable. Engineer may check contents of each submittal set upon initial delivery; if not complete as set forth herein, submittal sets may be returned to Contractor without review and approval and will not be accepted until made complete.

J. The Project Architect/Engineer shall have the authority to determine the method of submitting shop drawings whether in multiple sets or by the reproducible transparency technique. The Project Architect/Engineer shall instruct the Contractor and the Subcontractors at the pre-construction meeting as to the method to be used. The Contractor shall submit shop drawings and technical data for each product within thirty (30) calendar days of award of the Contract by the Owner.

K. However, the following number of shop drawings and submittals shall be the minimum number reproduced for distribution:

For the Project Architect/Engineer and the school district, furnish the quantity set forth in each pertinent subparagraph under Section 00 73 00, Special Requirements, and Closeout Documents. In particular, furnish one copy for the following:

1. The Project Architect's file record.
2. The Project Architect's Engineer for his file record.
3. The Contractor's main office file.
4. The Contractor's field office.
5. The Subcontractor's file.
6. The Subcontractor's field office.
7. The workers in the field.
8. The Facilities Design & Construction file (AFTER APPROVAL).
9. The Maintenance Department file (AFTER APPROVAL).
10. The School's (or Facilities) Head Plant Operator's file (AFTER APPROVAL).

L. Submittals are required for all items of mechanical and electrical equipment and products provided by this contractor. Refer to each section for additional requirements.

M. Submittals shall be referenced correctly to the Contract Documents.

N. Manufacturer's catalog cuts may be submitted for all standard cataloged equipment, provided that the item required to meet the Project Specifications is not modified in any way from the standard catalog version of said item.

O. Cuts shall be clearly marked to indicate the exact size, type, rating, capacity, etc., of the item to be furnished.

P. Bind shop drawings/catalog-cuts in folders with a title sheet and identification on front of the folder. Submit all at one time. Allow space for Contractor, Project Architect, and Engineer review stamps.

Q. All submittals must bear the handwritten signature of the Contractor and his stamp of approval before being considered for review by the Project Architect/Engineer.

R. Shop drawings and submittals which have not been previously approved and corrected and so marked by the Contractor, will be returned to the Contractor for such action before the Project Architect or Engineer will review and comment on such submittals.

S. Partial submittals will not be accepted for review and approval.

T. Full submittal shall be made for all equipment (whether or not it is exactly as specified) on the basis of design. Any items marked REJECTED or similarly marked shall be resubmitted and furnished exactly as specified.

U. Full electrical characteristics for each motor, piece of equipment or device shall be prominently displayed on the shop drawings or submittal. Prominently displayed on the shop drawings or prominently attached to the submittal shall mean a statement signed by maker of the submittal to the Contractor that he or she has carefully examined the electrical characteristics specified in the Contract Documents (and if remodeling or an addition, conformed to existing electrical characteristics), and that the motors, equipment or devices proposed to be furnished are compatible.

 This signed statement shall be on the shop drawings or submittal before forwarding to the Contractor who shall otherwise return these documents to the Subcontractor for resubmittal. The Contractor shall not forward incomplete documents to the Project Architect/Engineer. The responsibility to provide motors and equipment having compatibility with electric service provided shall rest with the Subcontractor furnishing the equipment, at no additional cost to the School Board.

V. Operating and maintenance manuals shall be provided in an organized manner.

 They should include instructions, wiring/control diagrams, spare parts list, warranties and test certificates. Any special tools or keys should also be included.

W. Test and Certifications:

1) Provide insulation resistance at ground continuity tests for all feeders, branch circuits, or other equipment. In no case shall the insulation resistance be less than 50,000 ohms at 600 volts.

2) Written test results and certification shall be required for proper fire alarm operation from the installer of the fire alarm equipment.

3) Optimum phase balance under full load conditions shall be obtained. Special care shall be taken to prevent reverse rotation of motors during these adjustments.

1.09 COOPERATION WITH OTHER TRADES

A. Give full cooperation to other trades and furnish in writing to the General Contractor, with copies to the Architect, any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.

B. When work installed under this Division will be in close proximity to, or will interfere with work of other trades, assist in working out space conditions to make a satisfactory adjustment. If so directed by the Engineer/Architect, prepare composite working drawings and sections at a suitable scale not less than 1/4" = 1'0", clearly showing how work is to be installed in relation to the work of other trades. If the work is installed before coordinating with other trades, or so as to cause any interference with work of other trades, make all the necessary changes in work to correct the condition without extra charge.

C. Furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

D. This Contractor shall coordinate the layout of electrical work with other trades involved. Locations of structural systems, plumbing, and heating work should take preference over the location of conduit runs.

1.10 PROTECTION

A. Protect all work and material provided under this Division from damage. All damaged equipment, work, or material provided under this Division shall be replaced with new. Rebuilt or Reconditioned materials are not acceptable.

B. Protect all work and equipment until inspected, tested, and accepted. Protect work against theft, injury, or damage; and carefully store material and equipment received on site which are not immediately installed. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of obstructing material.

1.11 SCAFFOLDING, RIGGING, AND HOISTING

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

1.12 REMOVAL OF RUBBISH

This Contractor shall at all times keep premises free from accumulations of waste materials or rubbish caused by his employees or work. At completion of work he shall remove all his tools, scaffolding, materials, and rubbish from the building and site. He shall leave the premises and his work in a clean, orderly, and acceptable condition.

1.13 SAFETY

This Contractor shall comply with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.333), Title 29—Labor, Chapter XIII, Bureau of Standards, Department of Labor, Part 1518—Safety and Health Regulations for Construction; and that his housekeeping and equipment be maintained in such a manner that they comply with the Florida Industrial Commission Safety Code and Regulations of the Federal Williams—Steiger Occupational Safety and Health Act of 1970 (OSHA), wherein it states that the Contractor shall not require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety.

1.14 SUPERVISION

This Contractor shall provide a competent, experienced, full time superintendent who is acceptable to the Architect/Engineer and Owner, and who is authorized to make decisions on behalf of the Contractor. Working foreman on jobs over $50,000 shall not be considered proper supervision.

1.15 MATERIAL AND WORKMANSHIP

A. All materials and apparatus required for the work, except as specifically specified otherwise, 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. Where no specific kind or quality of material is given, a first-class standard article as approved by the Engineer shall be furnished. Refer to substitutions in this Section.

B. Unless otherwise specifically indicated on the plans or specifications, all equipment and materials shall be installed with the approval of the Architect and Engineer in accordance with the recommendations of the manufacturer. This includes the performance of such tests as the manufacturer recommends.

1.16 QUIET OPERATION AND VIBRATION

All work shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the Engineer and the Owner. 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. Sound or vibration conditions considered objectionable by the Engineer and the Owner shall be corrected in an approved manner at no additional expense to the Owner.

1.17 FOUNDATIONS, SUPPORTS, PIERS, ATTACHMENTS

A. This Contractor shall furnish and install all necessary foundations, supports, pads, bases and piers required for all equipment furnished under this Division, and shall submit drawings to the Architect and Engineer for approval before purchase, fabrication, or construction of same.

B. For all floor mounted equipment, provide concrete pads which extend six inches (6") beyond equipment base in all directions with top edge chamfered. Inset six inches (6") steel dowel rods into floors to anchor pads. Shop drawings of all foundations and pads shall be submitted to the Architect and Engineer for approval before same are constructed.

C. Construction of foundations, supports, pads, bases, and piers where mounted on the floor, shall be the same materials and same quality of finish as the adjacent and surrounding flooring material.

D. All equipment, unless shown otherwise, shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the Architect and the Engineer, not strong enough shall be replaced as directed.

1.18 ACCESS DOORS FOR WALLS AND CEILINGS

A. Provide flush panel access doors with a 16 gauge steel frame and a 14 gauge steel door panel.

B. Finish is to be primed painted steel.

C. Provide concealed hinges which allow the door to open 175 degrees and have a removable pin.

D. Provide access doors with a locked flush mounted vandal proof spanner head operated steel cams.

E. Provide 1-1/2 hour "B" label door for rated chase walls.

F. Furnish masonry anchors for installation in masonry walls and metal lath wings with casing bead for plaster installation.

G. Provide a minimum 2'-0" by 2'-0" access doors unless shown or noted otherwise on the drawings.

H. Access doors for chase walls shall be mounted 16" off the finish floor.

I. Access doors for electrical equipment shall be a minimum of 12" larger than equipment all around.

J. Each pertinent Subcontractor shall furnish access doors for access to all electrical pull boxes, dampers, and other electrical equipment the Subcontractor furnishes which are concealed in walls, furring and in hung ceilings, or where may be necessary.

K. Delivery: These access doors shall be delivered to the Contractor for installation by the appropriate trade. Delivery of the access doors shall be made so as not to cause delay in the work of the Contractor or other trades.

L. Material and Finish: Access doors shall conform to the finish of adjacent construction as indicated in the Project Architect's finish schedule. Access doors shall be as specified by the Project Architect/Engineer.

M. Quality Control: Each Subcontractor shall inspect the installation of the access doors and shall immediately inform the Contractor in writing if they are not being located and installed to afford proper access to the equipment.

1.19 EXPOSED WORK

All ductwork, piping and conduit shall be concealed from view of occupied spaces and shall be concealed from view from the exterior, unless such is specifically identified on the Drawings or Specifications to be exposed.

1.20 COORDINATION WITH BEGINNING AND/OR CONTINUING SCHOOL (OR FACILITY) OPERATIONS

Subcontractors doing work in Sections under Division 26 shall read and comply with requirements set forth in Section 00 72 00, Standard Requirements, as to keeping school or facilities operating in a safe and practical fashion. Difficulties on this Project will result in the Contractors responsible being prohibited from doing future Pinellas County School Board work.

1.21 ROOF TOP WORK PROHIBITED

No electrical or other equipment, piping, conduit or other materials shall be installed or placed on roof tops of buildings or on covered walkways excepting exit- housing for intake or exhaust of ventilating fans and immediately adjacent electrical work serving such equipment.

1.22 MINIMUM HEAD CLEARANCE IN OCCUPIED SPACES

No electrical or other equipment, piping, conduit, structural framing and support elements of suspended equipment or boxed-in soffits shall be installed in a manner which occurs lower than 8'-0" above the finished floor of the area it occurs above, if people can stand or walk under it.

1.23 CONSTRUCTION FACILITIES

A. Temporary construction facilities such as temporary toilets, temporary wiring, electric outlets, temporary lighting, grounding, storage and work areas, field offices, shall be as set forth in Section 00 72 00, Standard Requirements, Paragraphs 7A - 7H, and as set forth in Section 00 73 00, Special Requirements.

B. On-site office facilities, construction water, temporary sewage connections, temporary construction site restroom facilities, electricity for construction, existing fire alarms, emergency lighting, temporary lighting, existing intercom and electrical systems, use of site, etc., shall be as set forth in Section 00 73 00, Special Requirements, Paragraphs 4, 5, 6, 7, 8, 9 and 10.

1.24 PROJECT RECORD DRAWINGS—CHANGES

Comply with Section 00 72 00, Standard Requirements.

1.25 USE OF SITE FOR CONSTRUCTION PURPOSES

Comply with the requirements set forth in Section 00 73 00, Special Requirements, for use of the site for access and construction purpose.

1.26 OWNERSHIP OF EXISTING EQUIPMENT AND HANDLING THEREOF

A. Comply with the requirements set forth in Section 00 73 00, Special Requirements, for the removal, transportation and delivery of special equipment/material set forth to be delivered on a prearranged schedule to Walter Pownall Service Center.

B. Such equipment/material is owned by the School District and is not to be taken by or otherwise disposed of by the Contractor (or Subcontractors). If such unauthorized removal or disposal is done, this Contractor will be back charged a sum representing fair market retail value of such items.

C. Provide demolition of existing work in remodeled areas as indicated on Drawings.

 Demolition includes but is not limited to removal of all equipment, controls, piping, ducts, supports, panels, meters, raceways, etc. and filling, patching and painting to match existing surfaces.

1.27 PROJECT CONDITIONS

A. All existing electrical utilities shall be located prior to the beginning of work. Any conflicts should be identified and noted on As-Built (Record) drawings.

B. Adequate means of protection for all utilities should be provided and, if damaged during working operations, such shall be repaired to the satisfaction of the utility owner at this Contractor's expense.

C. Where existing devices are permanently abandoned, each outlet, branch circuit, etc. shall be removed completely and the conduit plugged or capped at a point well behind the proposed new finished closures or newly finished surfaces.

D. Install Work in locations shown on Drawings, unless prevented by Project conditions.

E. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Architect/Engineer before proceeding.

F. The Contractor shall inform the Engineer of any work or materials which conflict with any of the applicable codes, standards, laws and regulations before submitting his bid.

G. The scope of the work included under this Division of the Specifications shall include complete electrical systems as shown on the plans and as specified herein. The General Conditions and Special Conditions of these specifications shall form a part and be included under this Section of the Specifications. Provide all supervision, labor, material, equipment, machinery, factory trained personnel, and any and all other items necessary to complete the electrical systems. All items of equipment are specified in the singular; however, provide and install the number of items of equipment as indicated on the drawings, and as required for complete systems.

1.28 TEMPORARY ELECTRIC

The Contractor will be required to furnish power for the office trailer. The school power may be utilized for construction work during a renovation project. If a new building is under construction it will be the Contractor's responsibility to provide and pay for temporary power. (Specification writer: See Section 00 73 00, Special Requirements).

1.29 ELECTRICAL CONNECTIONS

Each Subcontractor under Division 26 shall provide and install all electrical work and connections except those specifically set forth below as being provided and installed by the Mechanical Subcontractor under Divisions 22 or 23.

1. The Electrical Contractor shall furnish and install all wiring under Division 26, except:
2. Temperature Control Wiring
3. Equipment Control Wiring
4. Interlock Wiring

2) The Electrical Contractor shall furnish and install under Division 26 all power wiring complete from power source to motor or equipment junction box, including power wiring through starters and shall connect to power lugs on the equipment. Nothing in any section in Divisions 22, 23, 26, 27, or 28 shall overrule this.

1.30 CONDUITS

When conduit is required for low voltage wiring, the Electrical Subcontractor shall provide and install same under Division 26.

1.31 MOTORS

A. Motors shall be furnished by the manufacturer or supplier of the specified equipment.

B. General purpose motors shall be open drip-proof conforming to NEMA Design B, Class B insulation, continuous 40 degree C ambient, 60 Hz, 1.15 service factor, and

 1800 RPM maximum speed unless specified otherwise. Voltage shall be as specified in individual Specification Sections. All motors 3/4 HP and smaller shall be self-lubricating. Larger motors shall be self-lubricated, if specified.

C. Motors shall be protected with thermal overload devices at the motor, or by the motor starter. Disconnect switch at motors are for service purposes and shall be unfused type, unless fusing is specifically required by the manufacturer.

1. Motors smaller than 3/4 HP shall be single phase and shall be three phase when 3/4

HP and larger, unless specified otherwise.

1) Single phase motors 1/2 HP and smaller shall have built-in overload protection furnished by the Mechanical Subcontractor; single phase and three phase motors larger than 1/2 HP shall have separate motor starters furnished by the Mechanical Subcontractor and installed by the Electrical Subcontractor as overload protection.

2) Single phase motors shall be capacitor start, capacitor run.

3) Equipment requiring 1,000 watts or more shall have a power factor of 85% or greater at rated load conditions. Equipment with a power factor less than 85% shall be corrected to at least 90% power factor under full load operating conditions. Power factor corrective devices shall be switched with related equipment.

4) Motor characteristics which change from that specified, due to the Contractor electing to use one of the optional manufacturers, or an updated model, etc., shall be coordinated with the Electrical Subcontractor, through the General Contractor.

The Contractor making the change is responsible for the cost and design of any revisions necessary to provide proper power and control connections in full accordance with the National Electrical Code, and State and Local Codes.

5) Phase monitors shall be provided by this Contractor for motors over 3/4 HP.

E. The Electrical Contractor shall install under Division 26 all motor starters and contactors, except when specified to be furnished by the equipment manufacturer under Divisions 22 and 23. Separate motor starters shall be provided by the Mechanical Subcontractor and installed by the Electrical Subcontractor, ANY WORK IN DIVISIONS 22, 23, AND 26 TO THE CONTRARY NOT WITHSTANDING.

F. Electrical work provided and installed by Subcontractors under Divisions 22, 23 and 26 shall be performed by electrical contractors licensed under the Florida Construction Industries Licensing Board, and by properly qualified foremen, journeymen and apprentices. At least one electrician licensed by the State of Florida shall be on the site whenever any electrical work is being done. All fire alarm wiring shall be by licensed and experienced technicians trained by the manufacturer of the equipment.

G. Air conditioning equipment containing various electrical components within its housing shall be furnished by Division 23 with internal wiring arranged to terminate at one set of electrical power lugs. Components shall be approved for group operation as defined by the National Electrical Code, or auxiliary equipment must be provided as required to satisfy the National Electrical Code and UL Labels (or other appropriate labels) of the unit.

H. Where specific instructions are not indicated or specified, provide the following items on the installation of motor equipment furnished under Division 26:

1) Provide templates and anchor bolts.

2) For equipment placed on the ground floor or on the structural system, provide a minimum of a four inch (4") thick reinforced concrete equipment pads, and also provide resilient isolation pads between equipment and slab or structure. Such slabs shall be designed and reinforced to meet the conditions.

3) For suspended equipment, this Contractor shall provide structural supports designed to carry all loads, with "simple" framing, anchoring devices and vibration isolation devices approved by the Project Architect/Engineer.

I. Control devices, such as thermostats, firetraps, step controllers, strip heat contactors, etc., shall be installed in place under the Mechanical Sections of these Specifications and shall be wired complete under the pertinent Mechanical Section. All control circuiting shall be installed in accordance with diagrams furnished under the appropriate Mechanical Section, and which have been approved by the Project Architect/Engineer.

1.32 PAINTING

A. General:

All field painting shall be performed under the subcontract for electrical work and shall be as specified in the Painting Section of Division 09 of the Specifications. Each Subcontractor shall leave his work clean and free from oil, dirt, and grease and shall do field painting, where required.

B. The Contractor providing equipment, conduit, raceways, piping, etc., shall, upon completion, thoroughly clean all work to remove all dirt, grease, rust and oil. The Contractor shall vacuum clean the inside and outside of panel box and equipment cabinets. The Contractor shall clean galvanized piping, conduit, raceway, and work in exposed areas with diluted acetic acid. He shall thoroughly prepare all such work for painting.

C. Equipment:

1) All equipment shall have factory standard finish. Where zinc chromate paint is specified to be left for painting by each Subcontractor, it shall be made up in synthetic resin vehicle.

2) Factory finished equipment which has rusted or been damaged shall be repaired, cleaned, spot primed and entirely repainted the original color by this Contractor.

3) Insulation coverings shall be cleaned, sized (if necessary), and painted for service identification by this Contractor.

D. Ferrous metal installed under this Division 26 of the Specifications which is exposed to view or to the weather, such as conduits, raceway, supports, etc., shall first be painted with one coat of priming zinc chromate. Finished paint shall be in accordance with the Painting Section of Division 09 by the Contractor providing the work under the Electrical Section.

E. Painting Schedule for visible equipment & conduit:

Table 1 - Color Identification

|  |  |  |
| --- | --- | --- |
| Classification | Predominant Color of System | Color of Letters for Legend |
| F - Fire protection | Red | White materials & equipment |
| D - Dangerous | Yellow (or orange) | Black  |
| S - Safe Materials | Green (or the achromatic colors: white, black, gray, or aluminum |  |
| P - Protective materials | Bright Blue | White |

1.33 PENETRATION OF ROOFING MEMBRANES

1. Penetration of finished roofing or roofing membranes by work under this Division 26 shall only be done through curbed construction that meets the requirements of Division 07 and Chapter 15 of the Florida Building Code.

B. Such curbs shall be constructed to meet the requirements of Division 07 and Chapter 15 of the Florida Building Code. Such curbs shall be thoroughly anchored to the roof framing system. All necessary steel framing shall be provided and installed.

C. The Subcontractor providing the conduit or equipment penetrating the finished roofing or roofing membrane shall provide the roof curbing and cant system prefabricated and ready for the (General) Contractor to install, for and to which the Roofing Subcontractor shall provide and install roofing membrane and fabric base flashing.

D. The Subcontractor providing the conduit or equipment penetrating the finished roofing or roofing membrane shall provide, for the (General) Contractor to install, miscellaneous steel framing members to support the roof curbs and to anchor to the roof framing system.

E. The Subcontractor providing the conduit or equipment penetrating the finished roofing or roofing membrane shall, in every instance, provide the metal counterflashing (which may be an integral part of the equipment housing) to cover and to extend down over the upturned roofing membrane and fabric base flashing perimetering the curb, by a minimum of three (3) inches.

F. Penetration of finished roofing or roofing membranes by conduit vents or similar work:

1) For built-up roofs, modified bitumen roofs, single ply roofs, clay or cement tile roofs or shingle roof, conduit penetrations shall be curbed and flashed as specified in Division 07 and the Florida Building Code.

2) For metal roofs, conduit and similar penetrations shall be flashed with special roof vent flashings compatible with the metal roof.

3) Such flashing shall be furnished to the Contractor to be installed by the Roofing Subcontractor.

G. Electrical conduit shall only penetrate roofing membrane through curbed openings (whether such opening serves equipment penetration or a grouping of conduit).

1.34 PENETRATION OF WATERPROOFING (INCLUDING WATERPROOF CONCRETE)

A. Quality Control:

Where any work pierces waterproofing including waterproof concrete, the method of installation shall be as approved by the Project Architect/Engineer before work is done.

1. Materials and Installation:

The Subcontractor causing the penetration shall furnish and install in a timely fashion all necessary sleeves, caulking, and flashing materials required to make openings absolutely water tight.

1.35 PENETRATION OF SOUNDPROOFING

A. The Subcontractor causing the penetration of any sound proofing materials shall provide all necessary materials and labor to provide thorough and complete caulking of all penetrations through walls, partitions and decks, whether such penetration occurs above or below dropped ceiling lines.

B. Penetrations of special materials (such as face brick, precast concrete, etc.) shall be done by the trades doing such original work, at the expense of the Subcontractor needing the penetration.

C. Penetrations shall be cut or patched by such skilled mechanics in a manner that the hole is uniformly 1/8 inch clear all around the item penetrating it (including insulation) so that a full penetration (but not excessive) sealant bead can be installed.

D. This Subcontractor shall do all sealant work required to seal completely on both sides of walls, partitions and decks which are penetrated.

E. Sealing work shall be done in strict compliance with requirements of the Caulking and Sealants Section.

F. Any pipe, duct, conduit or other item penetrating a wall, partition or deck which item tends to vibrate, shall have sufficient corrective methods effected to one or both sides of the penetration that no vibration occurs at point of penetration. This work, or the cost of such work, shall be at the expense of the Subcontractor needing the penetration.

1.36 DEFINITIONS

A. The definitions set forth in Division 01, Instruction to Bidders, shall apply to Sections in this Division 26. (Such also includes the definitions in the General Conditions.)

B. Additional Technical Definitions:

1) "Raceway" shall mean pipe, conduit, fittings, flanges, controls, hangers, and items customarily required in connection with the transmission of electrical energy.

2) "Concealed" shall mean embedded in masonry or other construction, installed within or behind wall furring, within partitions or double partitions or hung ceilings, in crawl spaces, in shafts, in chases, buried in trenches.

3) "Exposed" shall mean not concealed

4) "Demolition" shall be the removal of any existing equipment, and the capping or plugging of any existing services to that equipment. (See paragraph 1.26 above.)

5) "Furnish" means to purchase and deliver products and equipment to the project site and prepare for installation.

6) "Install" means to uncrate, assemble, erect, place, anchor and connect furnished products into satisfactory operation.

7) "Provide" means to furnish and install

1.37 AMPLIFICATION

1. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of an item, in the Drawings or Specifications either or both, carries with it the intent to furnish and install the item, regardless of whether or not this is explicitly stated as part of the indication or description.

B. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings."

C. In case of discrepancy concerning quality and/or quantity within the Contract Documents, this Contractor shall provide the better quality and/or the greater quantity unless otherwise determined in writing by the Project Architect/Engineer, at no increase to the Contract amount.

D. No exclusions from, or limitations in, the language used in the Drawings or Specifications shall be interpreted as meaning that the appurtenances or accessories necessary to complete any required system or item of equipment are to be omitted. This Contractor shall furnish and install such at no increase to the Contract amount.

E. The Drawings, of necessity, utilize symbols and schematic diagrams to indicate various items of work. Neither of these have any dimensional significance nor do they delineate every item required for the intended installations. The Work shall be installed, in accordance with the diagrammatic intent expressed on the electrical and mechanical drawings, and in conformity with the dimensions indicated on final architectural and structural drawings. Such may be adjusted to accommodate equipment shop drawings.

F. Where Drawings and Specifications conflict, it shall be the responsibility of this Contractor to bring such conflict to the attention of the Project Architect/Engineer for clarification. In general, the architectural drawings shall take precedence over the mechanical or electrical drawings with reference to building construction. Any change from the drawings necessary to make the work conform with the building as constructed and to fit the work of other trades or to the rules of authorities having jurisdiction, shall be made at no expense to the Owner.

G. No interpretation shall be made from the limitations of symbols and diagrams that any elements necessary for complete Work are excluded.

H. Certain details appear on the Drawings which are specific with regard to the dimensioning and positioning of the Work. These details are intended only for the purpose of establishing general feasibility. They do not obviate this Contractor's responsibility for field coordination for the indicated Work. It shall be the duty of this Contractor to supplement any plans and details shown with his own knowledge and experience concerning good installation practice and, with the approval of the inspecting authority, to make any modifications necessary to fit the specific equipment for use, to avoid conflicts with other trades, and to execute this work properly in accordance with the full intent and meaning of the Drawings and Specifications.

I. Capacities, sizes and conditions specified or shown are allowable minimums. Based on design and rated operating conditions of systems, motors shall not be overloaded. Equipment shall not operate at speeds or temperatures greater than manufacturer's published recommendations, and no strain or demand shall be imposed upon any component of any system, structure or building. Also, no quality of architectural feature, function, or end result shall be adversely affected.

J. Information as to the general construction shall be derived from structural and architectural Drawings and Specifications.

K. The use of a word in the singular shall not be considered as limiting where other indications denote that more than one item is required. The determining of correct quantities in compiling his bid shall be the responsibility of this Contractor. The authority for determining the intent of the Contract Documents shall, in the first instance, be that of the Project Architect/ Engineer.

L. In the event that extra work is authorized and performed by this Contractor, Work shown on Drawings depicting such extra work, and/or described by Addendum, or by Change Order, shall be subject to the basic building and Contract Specifications in all respects.

1.38 QUALITY ASSURANCE

A. Standards: Certain standard materials and installation requirements are described by reference to standard specifications. These standards include the following:

1. ASA American Standards Association
2. ASTM American Society for Testing and Materials
3. ASME American Society of Mechanical Engineers - Code of Unfired Pressure Vessels
4. NFPA National Fire Protection Association
5. NEMA National Electrical Manufacturers Association
6. UL Underwriters Laboratories
7. ANSI American National Standards Institute
8. ASHRAE American Society of Heating, Refrigerating, and Air Conditioning Engineers
9. SMACNA Sheet Metal and Air Conditioning Contractors' National Association
10. AMCA Air Moving and Conditioning Association
11. ARI Air Conditioning and Refrigeration Institute
12. AMA Acoustical Materials Association
13. NEC National Electrical Code
14. IEEE Institute of Electrical and Electronic Engineers
15. EIA Electric Industries Associates
16. IES Illuminating Engineering Society

B. Whenever a reference is made to a standard, installation and materials, the intention is such shall comply with the latest published edition at the time project is bid, unless the edition is otherwise specified herein.

C. Materials and equipment herein shall be new and standard catalogued items manufactured by reputable concerns regularly supplying such materials. Material shall bear the Underwriters' Laboratories, Inc. label (or other appropriate label) where such is required or allowed by code, by Contract Documents or by authorities having jurisdiction.

D. Product deliveries shall be arranged in accordance with construction schedules and to avoid conflict with work and site conditions.

1) Deliver and store products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2) Immediately upon delivery, this Contractor shall inspect shipments to assure compliance with the requirements of the Contract Documents and approved submittals, and that products are properly protected and undamaged.

3) Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

E. Codes and Rules:

All material furnished and all work installed shall comply with the following codes (Current Editions) as they apply to this project:

1. NFPA 70, 72 and 101
2. Florida Building Code/SREF
3. Regulations of the Florida Industrial Commission Concerning Safety
4. Applicable County, State and Local Building Codes
5. Local and State Fire Marshal Rules and Regulations
6. Chapter 4A-47, Florida Administrative Code—Uniform Fire Safety Standards for Elevators
7. Occupational Safety and Health Agency Standards (OSHA)
8. Florida State Board of Health Rules and Regulations
9. Florida Department of Education - Office of Educational Facilities; State Requirements for Educational Facilities (SREF), Current Edition

Applicable codes shall be those adopted by the authority having jurisdiction at the time project is bid.

F. Permits, Fees, and Inspections

1) The Contractor shall give all necessary notices, obtain all permits, and pay all government fees, sales taxes, and other costs, including utility connections or extensions, in connection with this work; file all necessary approvals of all governmental departments having jurisdiction.

2) Obtain all required certificates of inspection for their work and deliver to the Owner/Engineer the same certificates before request for acceptance and final payment for the work.

3) The Contractor shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus, and drawings required to comply with all applicable laws, ordinances, rules, and regulations.

4) The Contractor shall inform the Engineer of any work or materials which conflict with any of the applicable codes, standards, laws, and regulations before submitting their bid.

1.39 CONTRACTOR QUALIFICATIONS

A. The Contractor or Subcontractors performing work under all Sections of this Division 26 shall be regularly engaged in the type of work to be furnished under these Sections and shall be licensed under the Florida Construction Industries Licensing Boards for such specialty trades, and such firms shall employ properly qualified foremen, journeymen and apprentices as appropriate and in keeping with best trade practices.

B. Each firm shall be able to provide, upon request, a list of similar jobs it has completed.

C. The Project Architect/Engineer and the Owner reserve the right to reject Subcontractors who have seriously questionable capabilities to perform the specific type and quality of work intended, or who have a poor record in performance. (See Division 01, Supplementary General Conditions.)

1.40 ORGANIZATION OF THE WORK

A. Each Subcontractor in Division 26 (i.e., this Contractor) shall put his work in place as fast as possible to meet all construction schedules, but only after coordinating his own work and the work priorities of other Subcontractors and the General Contractor.

B. Prior to starting the work, this Contractor shall carefully verify all measurements at the site and determine that the work will properly clear openings, structural members and the work of other trades. Correlate the time of each work item with all other items to the best advantage of the completed job. Furnish, in ample time to avoid delays in the work, all information required to revise footing elevations, structural elements, chases and openings in floors and walls, and to provide clearances which may be required to accommodate the work. Set all sleeves, anchor bolts and inserts required to accommodate equipment before concrete is poured or masonry is started.

C. Locate existing utilities prior to beginning work. Reroute or replace existing utilities where necessary to permit installation of Work. Provide adequate means of protection during work operations. Repair existing utilities damaged during work operations to the satisfaction of the utility and at this Contractor's expense.

D. Should uncharted or incorrectly charted electrical or other utilities be encountered during work operations, notify the Project Architect/Engineer and Facilities Design & Construction's Inspector immediately for procedure directions. Cooperate with utility companies in maintaining active utilities in operation.

E. It is this Contractor's responsibility to immediately act to put any damaged utilities back in functioning conditions. Resolution to establish obligation to bear the cost will follow.

F. Each Subcontractor in Division 26 shall, at all times while work under such subcontract is taking place, keep on the site a competent superintendent in charge of the Work. Such superintendent shall be replaced if unsatisfactory to the School District and/or Project Architect/Engineer.

G. Each Subcontractor shall maintain a complete file of all Contract Drawings, Specifications, and approved shop drawings at the site to be made available for inspection by School District's and/or Project Architect/Engineer's representatives.

H. Installation and equipment shop drawings shall be initialed and dated upon installation. This procedure will serve to ensure proper scheduling and enable Owner's representatives to check the work in progress.

I. Each Subcontractor shall be responsible for his work until its acceptance and final Substantial Completion, and shall replace any of the same which may be damaged, lost or stolen without additional cost to the School District.

J. Unless otherwise set forth in the subcontracting agreement, each Subcontractor shall furnish all scaffolding, rigging, hoisting and services necessary for erection and delivery to and removal from the premises of any equipment and apparatus furnished. Remove same from premises when no longer required.

K. Each Subcontractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by his employees or his work.

1) Normal construction cleaning: For new schools or facilities and new additions, or portions there of not yet certified as Substantially Complete and thereafter during holidays as above defined, only normal construction cleaning need be maintained by the Contractor. Such shall include complete removal of debris from the immediate construction areas and adjacent areas to one or more Contractor provided on-site refuse containers which containers the Contractor shall have emptied no less than once a week.

2) Special cleaning: At all other times (except holidays) the Contractor, in addition to normal construction cleaning, shall keep the areas needed by faculty, staff, and students (including corridor, exit ways ) free of all debris, materials, storage materials, and trash and periodically during the school day hours shall clean-up to a stage of being “broom clean.” The Contractor shall periodically “dust (oil) mop” the flooring as may be practical and as may be necessary to minimize dust.

3) Upon completion of the Contract or portions thereof and prior to or shortly after the Date of Substantial Completion, the Contractor shall clean all windows, glass, aluminum/steel or other metal, floors, walls, and other surfaces and make such surfaces clean and free of stain or discoloration. All surfaces shall be left by the Contractor in a first class finished condition as determined appropriate by the Project Architect.

L. The Contractor is required to minimize construction noise levels in all locations adjacent to or in occupied areas.

M. The Owner reserves that right to prevent use of any tools which cause detrimental vibration or noise when the school or facility is occupied.

N. Protect equipment and materials during construction from damage from water, dirt, welding and cutting splatter, paint droppings, etc., by use of shields and drop cloths. Damaged equipment or materials shall be repaired or replaced by the responsible Subcontractor to the Project Architect/Engineer's satisfaction.

O. Products stored outside shall be covered with waterproof drop cloths or tarpaulins. Equipment which may be damaged by the elements shall not be stored outside. Condensation shall be prevented by heating and ventilating.

P. During construction, maintain materials and equipment in an orderly manner.

Q. Provide the following accessory materials for electrical systems. Where similar accessory materials are specified with material and/or equipment, or are shown on the Drawings, the requirements of the Technical Specification Section or Drawings shall govern.

1) Anchor bolts or other anchoring devices be of the size and type recommended by equipment manufacturer for specific application.

2) Structural support (steel) for elevated or suspended mechanical items shall be made with connections using "simple" framing.

3) Resilient isolation pads for motors and equipment shall be rubber-in-shear pads and of type recommended by manufacturer of the motor and equipment unless otherwise specified. (See sound proofing requirements.)

4) Dielectric fittings shall be provided where copper joins steel, aluminum or iron, or any dissimilar metals such as insulating bushings or unions.

5) Escutcheons shall be provided where conduits pierce exposed partitions, floors, walls or ceilings, to cover raw edge. Escutcheons shall be chrome plated. (See sound proofing requirements.)

R. Delay caused by equipment not being on the job site when required shall be avoided in the following manner:

This Contractor shall furnish and install a temporary substitute piece of equipment (subject to approval of the Project Architect/Engineer), allowing the building to become operative. The temporary substitute equipment shall later be removed and replaced with that originally specified (or originally approved) when it arrives, all at the convenience of and at no additional cost to the Owner.

1.41 EXCAVATION

A. Each Subcontractor shall do trench and pit excavating and backfilling inside and outside the building, as required by his work, including shoring and bracing, pumping and protection for safety of persons and property. Trench excavations performed under this Contract whether by the Contractor or any Subcontractor shall be done in strict compliance with Florida Statute Chapter 553 Part III "The Trench Safety Act" (See Section 553.60-553.64). This pertains to the design of the trench safety system and shoring. (See Division 01, the Proposal Form and Instruction to Bidders).

B. Backfill shall be compacted in layers not exceeding six inches (6") in depth. Completed backfill shall conform to surrounding ground and finished grade and with compaction requirements of Division 31, Sitework.

1) Concrete encasement: Piping passing under footings, foundations and other locations, as shown on Drawings, shall be encased on all sides. Concrete shall conform to Division 03, Concrete Requirements.

2) Extend concrete encasement around piping and each side of footings or foundations.

C. Remove non-usable excavated material from the site. Deposit any usable surplus material on site where directed by the Project Architect/Engineer. Do not remove usable material from site.

D. Provide and maintain bracing, shoring, sheet piling, or sheathing as required to safely support sides of excavations. The Contractor doing the excavation and the Contractor using the excavation are responsible for safety in excavations.

E. This Contractor shall provide and operate pumping equipment to keep excavations free of water.

F. This Contractor is responsible for repairing and restoring paving, streets, curbs, walks, and other work in the area where excavations are made. Any existing underground piping, conduit, etc. damaged during construction, shall be returned to original condition at no additional cost to Owner.

G. Provide additional excavation and backfill where required to resolve conflicts in buried lines.

H. Coordinate timing of excavations in advance with other trades.

1. Excavation shall be open cut from the surface.

J. Hold trench width to a minimum.

K. Do not excavate utility trenches parallel to building footings closer than four feet (4') from the footings except by approval of the Project Architect/Engineer. When parallel trenches require cuts deeper than the building footings, the horizontal distance from the footing shall be equal to or greater than one and one half (1-1/2) times the vertical distance below the footing, but in no case shall the horizontal distance be less than four feet (4') except by the approval of the Project Architect/Engineer.

L. Mechanical excavation shall be held to four inches (4") above final grade of the bottom of trench. The remainder shall be shaped by manual excavation, so that piping is fully supported on undisturbed soil. Shoring of piping in trench will not be allowed. Piping must be suspended from above.

M. Whenever, in the opinion of the Project Architect/Engineer, the soil is unsuitable for supporting raceway and appurtenances, provisions for proper foundations shall be made at no additional cost to the Owner. Soil test reports are bound in the Specification book.

N. The Drawings for this project show the anticipated underground utilities. Where locations will interfere with proposed construction such shall be assumed to be a known factor to each Subcontractor unless such locations can be shown to be in error.

O. Wherever trenching or excavating, assume utilities may exist in area without such being shown on the Drawings. Exercise extreme caution. Should existing facilities be damaged, repair such to Project Architect/Engineer's satisfaction at no additional cost to the School District.

1.42 CHASE, CUTTING AND PATCHING

A. Provide and place required sleeves, forms and inserts before walls, ceilings, partitions, floors or roofs are built. The cost of cutting and patching of walls, partitions, ceilings, roofs and floors necessary for reception of this Contractor's work caused by his failure to provide or properly locate sleeves, forms and inserts, or caused by incorrect location of his Work, shall be borne by the offending Contractor.

B. Cutting of Finished Materials:

When it becomes necessary to cut finished materials, submit to the Project Architect/Engineer for approval, drawings showing the work required, and obtain approval before doing such cutting.

C. Chases and Openings:

Chases and openings in walls will be provided under the work of other Sections of these Specifications. This Contractor shall furnish exact dimensions and locations of these openings to suit the apparatus to be used before such walls are built, or shall bear the cost of the additional work to correct and provide for installation of such work.

D. Cutting of Work by Others:

No cutting or altering the work of other sections in these Specifications will be permitted without the approval of the Project Architect/Engineer and the Contractor. No structural members shall be cut without the previous written approval of the Project Architect/Engineer.

E. Core Boring:

1) Any holes in existing slabs or other concrete or finished work required for the installation of new piping shall be core bored and this Contractor shall seal around pipe or material. All fire ratings of slabs shall be maintained with approved UL listed fire rated products.

2) Prior to commencement of work, the area to be core drilled shall be examined by X-ray or ground penetrating radar.

F. Finish patch cut areas with floor tile, gypsum wallboard, plaster, ceiling panels or tiles as required to match existing. Paint entire disturbed area to match existing. This Contractor shall provide, at his expense, new ceiling panels and grid which his employees may have damaged during construction, utilizing skilled Subcontractors for each trade. Such work shall match existing.

1.43 LUBRICATION AND PACKING

A. Equipment furnished under Sections in Division 26 shall be lubricated by the Contractor furnishing such equipment, using manufacturer's recommended lubricants, with correct type and quantity of lubricant before placing into service. Damage caused by not providing proper lubrication shall be repaired at this Contractor's expense.

B. Lubrication of equipment requiring factory supervised start-up shall be verified by manufacturer's representative.

C. Packing glands shall be examined by this Contractor for proper packing. Proper packing seals shall be maintained during construction and during the warranty period.

1.44 QUIET OPERATION AND VIBRATION

A. Scope:

All equipment provided under Sections in this Division 26 shall operate (under all conditions of load), free of noise levels higher than specified in the pertinent Section and shall not be in excess of the requirements in Section 23 05 93, Testing and Balance, Sound Testing. Such shall be free of annoying vibrations. Sound and vibration conditions considered objectionable by the Project Architect/Engineer shall be corrected by whatever additional work is required in an approved manner at no cost to the School District.

B. Quality Control:

Vibration control shall be by means of approved vibration eliminators (or suppressor in a manner as specified and as recommended by the manufacturer of the eliminators. Submit shop drawings for review by the Project Architect/Engineer.

1.45 INSTRUCTIONS

A. After the systems are in operation, the Contractor furnishing the equipment will thoroughly instruct the designated Owner's personnel on operation and maintenance of electrical equipment and systems.

B. This Contractor shall schedule, with the Facilities Design & Construction's Inspector, a series of meetings which will be attended by several designated representatives of the School District's Maintenance Department, the Head Plant Operator and other designees of the Principal or Director of the school or facility and certain representatives of the Facilities Design & Construction's Department.

C. This Contractor shall be required to provide a minimum of twenty-four (24) hours total instruction to Maintenance Department and School Board personnel. Instructions shall include the following:

1) Location of equipment and explanation of function.

2) Review of operating instruction manual for record and clarity.

3) Explanation of specific maintenance requirements to be performed by the Owner.

D. This Contractor shall certify in writing that the designated personnel of the Owner (indicated above) were fully instructed in the care, operation and maintenance of all electrical equipment. This certification shall be signed by all persons attending acknowledging they attended the full instructional program.

1.46 EXISTING FIRE ALARM, SECURITY ALARM AND OTHER ALARMS EMERGENCY

LIGHTING, INTERCOM, ENERGY MANAGEMENT, AND ELECTRICAL SYSTEMS

A. For purposes of this Contract the assumption during bidding is that any and all existing fire alarm, intercom, security, emergency lighting and electrical systems are complete and operating properly.

B. Before commencing any work on fire alarm, security alarm, energy management, intercom, emergency lighting or electrical systems or any work which affects them, the specialty Contractor shall examine such system thoroughly. If this Contractor finds any portion of any system not functioning fully and properly, he shall notify the Project Architect/Engineer (PA/E) and the Facilities Design & Construction's (FD&C) Project Manager in writing exactly and precisely which item(s) are not working. (This paragraph does not require diagnosis as to why such item(s) are not working nor the repair of such.)

C. Upon above notification to the Owner, the PA/E and FD&C Inspector shall verify whether such report is accurate. If found not accurate, the PA/E and the FD&C Inspector shall demonstrate such to this Contractor. If the report is found accurate, the Owner may either:

1) Correct such deficiencies with his own Maintenance forces or by employing another specialty Contractor.

2) Require of the Contractor for this construction project a proposal sum to thoroughly diagnose the cause of such deficiencies and the specifying of precise corrective action needed.

3) Upon receipt of such proposal sum, the Owner may elect to employ the Contractor, by Change Order, to effect such corrections; or, with the Contractor's approval, employ the Contractor's appropriate specialty Contractor directly by Purchase Order, to effect such corrections; or the Owner may achieve corrections to the system by other means.

D. However, upon commencing any work under this Contract on fire alarm, security alarm, energy management, emergency lighting, intercom or electrical systems under this Construction Contract, this Contractor has accepted the systems as complete and functioning properly. From the time of commencing work on such systems, they become the responsibility of this Contractor to maintain and keep functional through the Date of Final Substantial Completion. If, at the time of Final Substantial Completion, such a system or portion of such system is found not to be functioning properly, such item shall be listed on the "punch-list" and shall be corrected by this Contractor. Once corrected, inspected by the PA/E and FD&C Inspector and found to be functioning properly, the item shall be removed from the "punch-list" as satisfied.

1. The guarantees, warranties and obligations of this Contractor for his work under this Contract shall not be extended to include the existing fire alarm, security alarm, other alarm systems, intercom, emergency lighting, energy management and electrical systems beyond the date of final acceptance of the work under this Contract.

1.47 CLEANING

A. This Contractor shall comply with all cleaning requirements as set forth in Section 00 72 00 - Standard Requirements.

1. Further, upon completion, raceways, panels, cabinets and equipment shall be thoroughly cleaned of dirt, grease, rust and oil, primed where necessary, and made ready for painting.

C. Clean galvanized work in exposed areas with diluted acetic acid.

D. Clean copper in exposed areas with emery cloth and solvent.

E. Clean gauges, thermostats and fittings.

1.48 BONDS

UPON BEING AWARDED A CONTRACT, THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE TO THE (GENERAL) CONTRACTOR, AT THE ELECTRICAL CONTRACTOR'S OWN EXPENSE, A COMPLETELY EXECUTED PERFORMANCE AND LABOR & MATERIAL PAYMENT BOND FOR 100% OF THE SUBCONTRACT SUM. Such bonds shall be provided by a Surety company licensed in Florida and meeting all requirements of Division 01, Instruction to Bidders. These bonds shall be executed as a warranty bond for at least one (1) year following the date of the Final Substantial Completion of the completed project.

1.49 LICENSE

A. The Subcontracting Firm for the electrical and systems installation shall be licensed by the State of Florida and the local authorities, regularly engaged in the installation of electrical systems, and other related equipment. The Subcontracting Firm shall be familiar with all local conditions including interpretations, codes and shall have at least five (5) years of successful installation experience on similar projects of the same magnitude and scope.

B. The Subcontracting Firm shall list at least three (3) projects it has successfully completed over the last five (5) years for proof of experience of this caliber. This list shall be included with submittals for review by Architect/Engineer. The Subcontracting Firm shall hold a Florida State Certified Electrical Contractor license for this project. The Subcontracting firm for the fire alarm system shall be a certified "EF" installer.

1.50 AS-BUILT DRAWINGS

The Contractor shall provide AutoCAD as-built drawings and copies of each AutoCAD file on CD before final payment will be issued.

**END OF SECTION**