PROJECT MANUAL

WOODSON FOOD SERVICES GENERATOR

9515 MAIN ST, FAIRFAX, VA 22031
CLIENT PROJECT MMB-088-24

SPECIFICATION VOL. 1

Gauthier, Alvarado & Associates

10201 Fairfax Boulevard – Suite 225
Fairfax, VA. 22030

703-241-2202

FAIRFAX COUNTY PUBLIC SCHOOLS

OFFICE OF FACILITIES MANAGEMENT
5025 SIDEBURN ROAD
FAIRFAX, VA 22032-2637
703-764-2457

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EMERGENCY GENERATOR INSTALLATION

AT

WOODSON FOOD SERVICES WAREHOUSE

9515 MAIN STREET
FAIRFAX, VA 22031

INVITATION FOR BID# MMB-088-24

FAIRFAX COUNTY PUBLIC SCHOOLS
OFFICE OF FACILITIES MANAGEMENT
5025 SIDEBURN ROAD
FAIRFAX, VA 22032-2637
(703) 764-2457

In the event of inclement weather that closes the Fairfax County Public Schools Central or Administrative Offices, bids will be due and opened at the same time, the following business day that offices are open. To confirm closing, visit us online at www.fcps.edu.

FAIRFAX COUNTY PUBLIC SCHOOLS
Woodson Food Services Building

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Fairfax County PUBLIC SCHOOLS
ENGAGE • INSPIRE • THRIVE

BIDDING REQUIREMENTS, CONTRACT FORMS, AND CONDITIONS OF THE CONTRACT

INVITATION FOR BID

1. RECEIPT OF BIDS

   Bids shall be submitted in duplicate and shall be delivered and time stamped in Room 62, Sideburn Support Center, 5025 Sideburn Road, Fairfax, VA 22032 on or before the hour and date designated, at which time they will be opened and read in public.

2. LUMP SUM

   Bids will be considered on a lump sum basis for the entire work described on the drawings and in the specifications.

3. DRAWINGS/SPECIFICATIONS

   Drawings and specifications may be examined, and one (1) set obtained at the Office of Facilities Management, 5025 Sideburn Road, Fairfax, VA 22032-6009 or downloaded from https://www.fcps.edu/get-involved/doing-business-fcps/facilities-management-current-solicitations

4. MINORITY/SMALL BUSINESS

   Minority contractors and small business enterprises are invited and encouraged to submit bids.

5. COMPLETION TIME

   The Contractor shall substantially complete the project within the time specified GENERAL CONDITIONS Item Number 16. Failure to complete this project within these specified dates without written agreement by FCPS Office of Facilities Management may result in the enforcement of liquidated damages or ineligibility to be awarded contracts on future FCPS Office of Facilities Management projects or both.

END OF SECTION

INSTRUCTIONS TO BIDDERS

1. QUALIFICATION OF BIDDER:

If a contract is for one hundred twenty thousand dollars ($120,000.00) or more, or if the total value of all construction removal, repair or improvements undertaken by the bidder within any twelve (12) month period is seven hundred fifty thousand dollars ($750,000.00) or more, the bidder is required under Title 54, Chapter 11, Code of Virginia (1950) as amended, to show evidence of being licensed as "Class A Contractor." **(Non-Virginia licenses are not acceptable.)** If a contract is seventy-five hundred dollars ($7,500.00) or more but less than one hundred twenty thousand dollars ($120,000.00) the bidder is required to show evidence of being licensed as a "Class B Contractor." The bidder shall place on the outside of the envelope containing the bid and shall place in over his signature whichever of the following notations is appropriate:

"Licensed Class A Virginia Contractor No. _____"
"Licensed Class B Virginia Contractor No. _____"

The Code of Virginia *does not allow an unlicensed contractor to submit a bid* where the resultant contract will require a license.

2. LICENSE REQUIREMENT:

All firms doing business in Fairfax County shall obtain a license as required by Chapter 4, Article 7, of The Code of the County of Fairfax, Virginia, as amended, entitled "Business, Professional and Occupational Licensing (BPOL) Tax." Questions concerning the BPOL tax should be directed to the Office of Assessments, telephone (703) 222-8234

3. REGISTERATION OF BUSINESS ENTITY:

Authorization to Transact Business in Virginia: By submitting a bid in response to this solicitation, the bidder represents and warrants as follows: (a) it has authorization to transact business in the Commonwealth of Virginia as a domestic or foreign business entity if so required by Title 13.1 or Title 50 of the Code of Virginia, or as otherwise required by law; and (b) it shall not allow its existence to lapse or its certification of authority or registration to transact business in Virginia, if so required under Title 13.1 or Title 50 of the Code of Virginia, to be revoked or cancelled at any time during the term of this Contract.

Certificate of Authority: Any foreign business entity transacting business in Virginia shall secure a certificate of authority as required by Title 13.1 or Title 50 of the Code of Virginia, from the State Corporation Commission, Post Office Box 1197, Richmond, Virginia 23209. The Commission may be reached at (804) 371-9733 or (800) 552-7945.

4. MANDATORY PRE-BID MEETING:

A mandatory pre-bid meeting will be held May 20, 2024* at 9:00 a.m. at **Woodson Food Services Warehouse, 9515 Main Street, Fairfax, VA 22031**. Contractors shall meet in the Lobby of the buildings front entrance to sign the meeting roster. **NO ONE WILL BE ADMITTED AFTER 9:05 A.M.**

** In the event of inclement weather on the date of the Mandatory Pre-Bid meeting that delays opening or closes the Fairfax County Public Schools Central or Administrative Offices, the meeting will be rescheduled by Addendum.*

The purpose of the pre-bid meeting is to provide potential Bidder's an opportunity to ask questions and obtain clarification about any aspect of this Invitation for Bid. Any changes or clarifications resulting from this pre-bid meeting will be issued in a written addendum.

It is important that all Bidders have a clear understanding of the specifications, scope of work, and requirements of this solicitation. Attendance at the pre-bid meeting will be a pre-requisite for submitting a Bid; attendance will be evidenced by the Contractor's signature on the meeting roster. Bidder's who do not attend the pre-bid meeting will not be permitted to submit a Bid. If a Bidder submits a Bid and did not attend the mandatory pre-bid meeting, the Bid will not be considered.

5. BIDDER'S QUESTIONS:

All contact between prospective Bidders and the Owner with respect to this solicitation will be formally held at scheduled meetings or will be conducted in writing through the Owner's Office of Facilities Management. Except as expressly authorized herein, communications between prospective bidders, their agents and/or representatives and any representative of the Owner concerning interpretation of all or any portion of this solicitation are prohibited and may not be relied upon for any purpose. No interpretation of the meaning of these documents will be made to any bidder orally.

Any question or request for an interpretation must be in writing and submitted to the Owner by U.S. Mail, commercially recognized overnight delivery service, or hand delivery during business hours addressed as follows:

Angela C. Mylechraine, CPPB, VCO, Contract Administrator
Fairfax County Public Schools
Department of Facilities and Transportation Services
Office of Facilities Management
5025 Sideburn Road, Room 62
Fairfax, Virginia 22032
Telephone Number: (703) 764-2457
Email: acmylechrain@fcps.edu

In order to be eligible for consideration, a question or request for interpretation must be received on or before the date that is three (3) days before the date established for the submission of bids.

6. ADDENDA:

Any and all such responses, interpretations and any supplemental instructions will be returned in writing to the prospective bidder requesting such interpretation or will be in the form of written addenda which, if issued, will be not later than two (2) days prior to the date fixed for submission of bids.

It shall be the responsibility of each bidder to monitor the Owner's website for Addenda issued at the following URL: https://www.fcps.edu/get-involved/doing-business-fcps/facilities-management-current-solicitations Notwithstanding any provision to the contrary, the failure of any bidder to monitor the Owner's website or to otherwise receive any addenda shall neither constitute grounds for withdrawal of a bid nor relieve such bidder from any responsibility for incorporation of the

provisions of any addenda into its bid.as submitted. All addenda so issued shall become part of the Contract Documents.

7. BID SECURITY:

Bids $100,000 or above shall be accompanied by a certified or cashier's check, cash escrow, or a bidder's bond in an amount not less than five percent (5%) of the amount of the bid, made payable to the Fairfax County Public Schools, Fairfax, Virginia. No other form of bid security is acceptable. The bidder's bond shall be issued by a surety company licensed to conduct business in Virginia and shall be on the form herein provided. Said check, escrow, or bond shall be given as a guarantee that the bidder will enter into a contract if awarded the work and, in case of refusal or failure to enter into said contract, the check, escrow, or bond will be declared forfeited to the Owner.

8. CONTRACT SECURITY:

A. For contracts $100,000 or above, the successful bidder, simultaneously with execution of the Contract, shall furnish a Performance Bond and a Payment Bond each in an amount equal to one hundred percent (100%) of the Contract price. Bonds shall be on the forms herein provided and shall be issued by a surety company licensed to conduct business in Virginia. The Owner reserves the right to request documentation from the surety company as to its financial capabilities, past experience, etc. In the event that the Contractor's surety company becomes insolvent, bankrupt or in any way is incapable of providing the services and/or security of the Performance and Payment Bonds, the Contractor shall within ten (10) days furnish a new Payment and a new Performance Bond to the Owner from a surety licensed to conduct business in Virginia. Any additional cost in securing new bonding will be the responsibility of the Contractor.

B. In lieu of a payment or performance bond, a bidder may furnish a certified check, cashier's check, or cash escrow in the face amount required for the bond.

C. The Contractor shall have the option to require all subcontractors furnishing labor and materials under this Contract in excess of two thousand five hundred dollars ($2,500.00) to furnish to the successful bidder a payment bond in the amount of fifty percent (50%) of the work sublet to the Contractor.

9. BIDS:

A. In order to be eligible for consideration, bids shall be made in accordance with the following instructions:

1. Before submitting a bid, each bidder shall become familiar with the requirements of the Contract Documents and shall include in its bid prices a sum sufficient to cover the cost of all items and services described herein.

2. Bids shall be made upon the Bid Form prepared and furnished by the Owner, a copy of which is bound herein. Bids must contain a bid for each of the items shown on the bid form. Failure to complete all requested prices shall be cause for rejection of the bid. The signatures of all persons shall be in longhand. The completed form shall be without erasures, exceptions, or alterations.

3. Bidder are required to submit with their completed Bid Forms the Bid Bond (or other authorized bid security) and all attachments to the Bid Form. Failure to provide all required documentation with the Bidder's response to this IFB may

result in rejection of the Bid. In addition, a Bidder's failure to sign the Bid Form (or any attachment) or Bidder's taking exception to the terms of any of the Contract Documents may result in rejection of its Bid.

4. Bids shall not contain any recapitulation of the work to be done, and alternate bids will not be considered unless called for. No oral, telegraphic bids or modifications will be considered.

5. Bids shall be time-stamped in Room 62, Sideburn Support Center, 5025 Sideburn Road, Fairfax, VA 22032, on or before the day and hour set for the opening of bids, enclosed in an opaque sealed envelope and bearing the title of the work, name of the bidder, and the bidder's Virginia Class A Contractor's License number. Bids may be modified or withdrawn by bidders prior to, but not later than, the time fixed for the opening of same.

6. It is the sole responsibility of each bidder to deliver its bid timely and to the precise location indicated as the place for receipt and opening of bids. Accordingly, bids which are transmitted via US Mail, commercial courier, or overnight delivery service to the Owner are not guaranteed to be brought timely to the attention of the Owner's official who is responsible for opening the bids for this project.

10. OPENING OF BIDS:

Bids will be opened and read aloud at the time and place set forth in the Invitation for Bid. Bidders, or their representative, and other interested persons may be present at the opening of the bids.

11. WITHDRAWAL OF BIDS:

A. A bidder may withdraw his bid from consideration if the price bid was substantially lower than the other bids due solely to a mistake therein, provided the bid was submitted in good faith, and the mistake was a clerical mistake as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor or materials made directly in the completion of a bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used in the preparation of the bid sought to be withdrawn. The bidder must give notice in writing of his claim of right to withdraw his bid within two (2) business days after the conclusion of the bid opening procedure. Any claim of a bidder for withdrawal shall be governed by Section 2.2-4330(B)(1) of the Code of Virginia, as amended.

B. No bid may be withdrawn when the result would be the awarding of this Contract to another bidder in which the ownership of the withdrawing bidder is more than five percent (5%).

C. If a bidder is permitted to withdraw a bid under this section, he may not thereafter, for compensation, supply any material or labor, or perform any subcontract or other work agreement for the person or firm to whom the Contract is ultimately awarded, or otherwise benefit directly or indirectly, from the performance of the project for which the withdrawn bid was submitted.

12. REJECTION OF BIDS:

The Owner reserves the right to accept or reject any or all bids, and/or to waive any informality which does not affect the price, quality, quantity or delivery scheduling for the goods, services or construction being procured in any one or all bids received.

13. AWARD OF CONTRACT:

A. The Contract will be awarded, if at all, to the lowest responsive and responsible bidder complying with these instructions and the Invitation for bid. The responsibility of bidders will be considered in making the award.

B. Bids shall be made upon the Bid Form prepared and furnished by the Owner, a copy of which is bound herein. Bids must contain a bid for the base bid and unit prices shown on the bid form. Failure to complete all requested prices shall be cause for rejection of the bid. Bids shall be stated both in writing and in figures. The signatures of all persons shall be in longhand. The complete form shall be without erasures or alternations.
Bids will be evaluated on the basis of a firm fixed price and award will be made to the lowest responsive and responsible bidder complying with all provisions of the Invitation for bid.

C. Unless cancelled or rejected, a responsive bid from the responsible bidder shall be accepted as submitted, except that if a bid from the responsive and responsible bidder exceeds available funds, then the Owner may negotiate with such responsive and responsible bidder to obtain a contract price that is within available funds.

Negotiation may be undertaken when there is insufficient time to re-advertise with a modified specification and/or there are not clearly definable elements of the specifications, which can be removed to permit a re-advertisement or it is otherwise in the best interest of the Owner to negotiate.

If negotiation is undertaken, the Owner may negotiate changes in the solicitation with the lowest responsive and responsible bidder to obtain a satisfactory price within available funds. If a satisfactory price cannot be agreed upon, then the negotiation shall be terminated, and the solicitation cancelled.

D. The Owner reserves the right to require any one or more bidders to submit the items specified in Subsection I below. Bidders are advised that it is the Owner's intention not to award a contract hereunder to any bidder whose past performance shows his firm to be generally late in performance of contracts or services. The ability of the lowest bidder with to provide the required bonds will not in and of itself establish the responsibility of the bidder.

E. The Owner reserves the right to defer award of Contract for a period of forty-five (45) calendar days after due date of bids. Bid prices shall be binding for forty-five (45) calendar days following bid-opening date, unless extended by mutual consent of all parties.

F. A "responsive bidder" shall mean a bidder who has submitted a bid, which conforms, in all material respects, to the requirements of the bidding documents.

G. A "responsible bidder" shall mean a bidder who has the capability, in all respects, to perform fully the Contract requirements and the moral and business integrity and

reliability, which will assure good faith performance. In determining responsibility, the following criteria will be considered:

1. The ability, capacity, and skill of the bidder to perform the Contract or provide the service required;

2. The ability of the bidder to perform the Contract or provide the service promptly, or within the time specified, without delay or interference;

3. The character, integrity, reputation, judgment, experience and efficiency of the bidder;

4. The quality of the bidder's performance on previous contracts or services;

5. The previous and existing compliance by the bidder with laws and ordinances relating to contracts or services;

6. The sufficiency or the financial resources and ability of the bidder to perform the Contract or provide the service.

7. The quality, availability and adaptability of the goods or services to the particular use required;

8. When the bidder is in arrears to the Owner or the County, or has defaulted on a project for the Owner or the County, or is delinquent on taxes and assessments to the County or on amounts due the Owner;

9. Such other information as may be deemed by the Owner as having a bearing on the decision to award the Contract, including, but not limited to:

   a. The ability, experience and commitment of the bidder properly to plan, schedule, coordinate, and execute the work under the Contract.

   b. Whether the bidder has ever been debarred from bidding or found ineligible for bidding on any other projects.

H. The purpose of subparagraph G, above, is to enable the Owner to select the bid, which is in its best interests

I. The Owner reserves the right to require from any one or more bidders the following:

1. Upon request of Owner, Bidders agree to submit references within one (1) business day after the opening of the bid;

2. A list of a minimum of five (5) projects completed by the bidder within the last two (2) years that are similar in size and scope to the services described herein; and

3. Financial statements indicating current financial status, prepared in accordance with generally accepted accounting principles, by a C.P.A. licensed to do business in Virginia.

J. Notice of intention to award a contract, as well as the award of the contract, will be posted on the website of the Owner's website at the following URL: https://www.fcps.edu/school-board/school-board-meetings While the school division staff

may communicate procurement results to bidders or offerors, each bidder or offeror has the responsibility to monitor the website for its own purposes.

14. PROTEST OF AWARD OR DECISION TO AWARD:

A. Any bidder may protest the award or the decision to award this Contract by submitting a protest in writing to Fairfax County Public Schools (FCPS) Superintendent or Designee, no later than ten (10) days after the award or the announcement of the decision to award, whichever occurs first; however, that no protest shall lie for a claim that the selected bidder is not a responsible bidder.

The written protest must include the basis for the protest and the nature of the relief sought. The Owner's Division Superintendent or Designee shall issue a decision in writing within ten (10) days after receipt of the protest, stating the reasons for the action taken.

This written decision shall be final unless the bidder appeals within ten (10) days after of receipt of the written decision by instituting legal action as provided in the Code of Virginia.

B. If, prior to the award, it is determined that the decision to award is arbitrary and capricious, then the sole relief shall be as hereinafter provided:

1. Where the award has been made but performance has not yet begun, the performance may be declared void by the School Board.

2. Where the award has been made and performance has begun, the Owner may declare the Contract void upon a finding that the action is in the best interest of the School Board.

3. Where a contract is declared void, the performing contractor shall be compensated for the cost of performance at the rate specified in the Contract up to the time of declaration. In no event shall the performing contractor be entitled to lost profits.

C. Pending final determination of a protest, the validity of the award shall not be affected by the fact that protest has been filed.

D. An award need not be delayed for the period allowed a bidder to protest, but in the event of a timely protest, no further action to award this Contract will be taken unless the Owner's Division Superintendent or Designee makes a written determination that proceeding without delay is necessary to protest the public interest or that the bid offer will expire.

15. APPEAL OF DETERMINATION OF NON-RESPONSIVENESS OR NON-RESPONSIBILITY:

A. Any bidder who, despite having the lowest bid, is determined not to be a responsive or responsible bidder for this Contract shall be notified in writing by the Owner. The written notice shall state the basis for the determination, and this determination shall be final unless the bidder appeals within ten (10) days after of receipt of the notice by instituting legal action as provided in the Code of Virginia. The bidder may not institute legal action until all statutory requirements have been met.

B. If it is determined that the Owner's decision was arbitrary and capricious, or otherwise in error, and this Contract has yet to be awarded, the sole relief available to the bidder shall be a finding that the Bidder is a responsive and responsible bidder for this Contract.

C. If the award has already been made and performance has begun, then the Owner may declare the Contract void upon a finding that this action is in its best interests. Where a contract is declared void, the performing contractor shall be compensated for the cost of performance up to the time of such declaration. In no event shall the performing contractor be entitled to lost profits.

16. SUBSTITUTIONS: **- NOT APPLICABLE**

Unless otherwise provided in the bid documents, the name of a certain brand, make, or manufacturer is intended to restrict bidders to the specific brand, make, or manufacturer specified. Substitute materials proposed as equal to materials specified shall be submitted in writing to the Owner by the bidder with full substantiating data for evaluation no later than ten (10) days prior to bid opening; substitute materials shall not be considered for evaluation after this time period. Proposed substitute materials which equal or exceed the performance standard of the specified materials in the sole judgment of the Owner will be included in an "Approved Substitute Materials Bulletin" to be issued prior to the bid opening date.

For purposes of this solicitation and any resulting contract, the Owner's designation of any one or more manufacturers, subcontractors and/or suppliers as "pre-approved" shall signify only that such manufacturers, subcontractors and suppliers previously have submitted work samples to the Owner that satisfied the Owner's requirements. The Owner's designation of any one or more manufacturers, subcontractors and/or suppliers as "pre-approved" shall in no event be deemed or construed to be a representation or warranty on the part of the Owner of any such manufacturer's, subcontractor's or supplier's capability of or capacity for (in terms of financial wherewithal, personnel and equipment availability, managerial ability, product quality or otherwise) performing or furnishing any portion of the Work in accordance with the requirements of this solicitation. Each bidder shall conduct such independent investigation into the qualifications, experience and abilities of its selected manufacturers, subcontractors and suppliers, as it deems appropriate under the circumstances.

17. FORM OF CONTRACT:

The Contract Documents are defined in the General Conditions to consist of "The Standard Construction Contract Agreement between Owner and Contractor, the Conditions of the Contract (General Conditions), the Special Provisions, the Drawings, the Specifications, the Bid Form (including all attachments), the Invitation for Bid, the Instructions to Bidder, all Addenda issued prior to execution of the Contract, and all Modifications thereto."

18. VIRGINIA FAIR EMPLOYMENT ACT:

The Contractor shall comply with the Virginia Fair Employment Act.

19. SMALL, MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISES:

A. The Fairfax County Human Rights Ordinances and relevant Federal and State Laws, orders and regulations require Fairfax County to ensure that its procurement practices are non-discriminatory and promote equality of opportunity for Small, Minority and Women-Owned Business Enterprises.

B. Small Business/Organization is an independently owned and operated business which, together with affiliates, has 250 or fewer employees or average annual gross receipts of $10 million or less averaged over the previous three years.

C. Minority Business is a business concern that is at least 51 percent owned by one or more minority individuals or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest in the corporation, partnership or limited liability company or other entity is owned by one or more minority individuals and both the management and daily business operations are controlled by one or more minority individuals. Such individuals shall include Asian American, African American, Hispanic American, Native American, Eskimo or Aleut.

D. Woman-Owned Business is a business concern that is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership or limited liability company or other entity, at least 51 percent of the equity ownership interest is owned by one or more women who are U.S. citizens or legal resident aliens, and both the management and daily business operations are controlled by one or more women who are U.S. citizens or legal resident aliens.

20. FAILURE TO EXECUTE CONTRACT:

In the event that the successful bidder, fails or refuses to execute the Contract within fifteen (15) days after he has received notice of the acceptance of his Bid, such bidder shall forfeit the bid security (which was submitted in form of Certified or Cashier's Check, cash escrow, or bid bond) with his Bid, as liquidated damages for such failure or refusal. The amount of such forfeiture will no exceed the lesser of: (a) the face amount of the bid security; and (b) the difference between the bid for which the bid security was provided and the next low bid for the Project.

21. SAFETY RESOLUTION:

Safety: The Contractor shall abide by, and shall be subject to, the Fairfax County Construction Resolution, as adopted by the Fairfax County Board of Supervisors on December 8, 2003, and as excepted and modified below:

A. It shall be required that each bid submitted for a contractor for construction, alteration, and/or repairs, or any other construction, shall include a list of all the following actions which have become final in the three years prior to the bid submission.

1. Willful violations, violations for failure to abate, or repeated violations, for which the bidder was cited by (a) the United States Occupational Safety and Health Administration; (b) the Virginia Occupational Safety and Health Administration; or (c) the occupational safety and health plan for any other state; or

2. Three (3) or more serious construction safety violations for which the bidder was cited by the (a) United States Occupational Safety and Health Administration; (b) the Virginia Occupational Safety and Health Administration; or (c) the occupational safety and health plan from any other state.

3. Termination of a contract between the Contractor and the County by the purchasing agent of his designee for safety violations.

B. If the bidder has not received or been the subject of any such violations in the three years prior to the bid submission, then the bidder shall so indicate by certification of Safety

Violations. The bidder will also be indicated on this form each state in which work was performed in the three (3) years prior to the bid submission.

C. No construction contract, as discussed above, may be bid on by any bidder or Contractor who has been the subject of any citations for the type and number of violations listed in Paragraph A, above, which have become final within three (3) years prior to bid submission.

1. Notwithstanding the language of Paragraph C, above, any bidder or Contractor who has been the subject of a violation, as described in Paragraph A(1), which has become final within three (3) years prior to bid submission, may bid, after a mandatory waiting period of twelve (12) months from the date the violation became final, if the bidder or Contractor satisfactorily passes eligibility evaluation.

2. Notwithstanding the language of Paragraph C, any bidder or Contractor who has been the subject of the type and number of violations as described in Paragraph A (2), which have become final within three (3) years prior to bid submission, may bid, after a mandatory waiting period of twelve (12) months from the date the last such violation became final, if the bidder or Contractor satisfactorily passes an eligibility evaluation.

3. Notwithstanding the language of Paragraph C, above, any bidder or Contractor who has previously been terminated from a County contract, as described in Paragraph A(3), within three (3) years prior to the bid submission, may bid, after a mandatory waiting period of twelve (12) months from the date of termination, if the bidder or Contractor satisfactorily passes an eligibility evaluation.

D. Prior to bidding on a project under the provisions of Paragraph C above, a Contractor may request that a determination be made regarding its eligibility to submit a bid on a contract under the terms of this resolution. However, this request for determination and any subsequent adjudication process must be completed prior to submitting a bid on any project and the request for determination must be received no later than twenty-one (21) days before bids are due, unless otherwise stated in the Advertisement for Bid.

E. No Contractor or Subcontractor contracting for any part of the contract work shall require any laborer, mechanic, or other person employed in the performance of the Contract to work in surroundings or under working conditions which are hazardous or dangerous to his safety, as determined under construction safety standards promulgated by the U.S. Department of Labor, or the Virginia Department of Labor and Industry.

F. No Contractor awarded a County construction contract shall knowingly employ or contract with any person, company, or corporation for services pursuant to that contract if such person, company or corporation could not have been awarded such contract due to the restrictions above.

G. The Contractor shall also certify in writing that all safety related information provided in accordance with the Safety Resolution and contract requirements are complete, accurate and truthful.

H. The failure to provide information requested pursuant to this Resolution or the failure to conform to the certification requirements of this Resolution shall be grounds for disqualifying a prospective bidder.

22. COMPLIANCE WITH LAWS:

The successful bidder shall be required to comply with all local, state and federal laws, rules, regulations and ordinances (collectively, the "Laws and Regulations") applicable to the Contract and to the work contemplated thereby. Each and every provision of Laws and Regulations required to be included in this IFB shall be read and enforced as though such provisions were included herein and if, through mistake or otherwise, any such provision of Laws and Regulations is not included herein and if, through mistake or otherwise, any such provision of Laws and Regulations is not included or is not correctly included, then upon application of either party the Contract shall forthwith be physically amended to make such insertion.

23. CANCELLATION, REJECTION OF BIDS; WAIVER OF INFORMALITIES:

The Owner reserves the right to cancel this solicitation, to accept or reject any or all bids submitted hereunder, or to waive any informality in any one or all bids received.

END OF SECTION

BID FORM

_____
Name of Contractor

_____
Address

_____
Date

TO: FAIRFAX COUNTY SCHOOL BOARD
FAIRFAX COUNTY PUBLIC SCHOOLS
DEPARTMENT OF FACILITIES AND TRANSPORTATION SERVICES
OFFICE OF FACILITIES MANAGEMENT
5025 Sideburn Road, Room 62
Fairfax, Virginia 22032

Gentlemen:

The undersigned, having examined the Documents, Drawings, and Specifications entitled:

Emergency Generator Installation
at
Woodson Food Services Warehouse

which compose the Contract Documents and having visited the site and examined all conditions affecting the work, hereby proposes and agrees to furnish all labor, materials, and equipment to perform all operations necessary to complete the entire work in strict accordance with the Contract Documents for the following amount (set forth in words and figures):

BASE BID AMOUNT FOR:

A. Woodson Food Services Warehouse:

$_____

_____Dollars

*MANUFACTURER:_____

***The undersigned agrees to list only one approved manufacturer and shall furnish and install only the above indicated manufacturer's product.**

1. **Certain Agreements of the Bidder:** The undersigned Bidder hereby makes the following representations, warranties and covenants to the Owner, which representations, warranties and covenants are intended to be relied upon by the Owner in making an award of the above-referenced Contract:

(a) Bidder has included in its bid all costs due to the Commonwealth of Virginia and County of Fairfax Sales and Use Taxes.

(b) The undersigned bidder is cognizant of Conflict of Interest provisions in the Virginia Code and specified in General Conditions, Paragraph 2.

(c) The undersigned bidder agrees, if awarded the Contract, to perform Substantial and Final Completion of the Work on or before the respective Substantial and Final Completion Dates established in Summary of Work.

(d) The Owner reserves the right to accept or reject any or all bids or to waive any informality in any one or all bids received.

(e) The undersigned bidder acknowledges receipt of any and all Addenda which may have been issued by the Owner, and acknowledges that the cost, if any, of revisions set forth therein has been included in the bidder's prices.

(f) The Owner reserves the right to defer award of Contract for a period of forty-five (45) days after due date of bids and the undersigned agrees that this Bid Form will remain open and binding during such period of time.

(g) The undersigned bidder hereby acknowledges that time is of the essence to the Contract and agrees to commence the Work in compliance with the response times established in accordance herewith and to fully complete the Project within the specified time, including normal inclement weather delays. The undersigned hereby covenants and agrees to achieve timely completion of all services described herein and to comply with all emergency and non-emergency response times established pursuant to the Contract.

2. **Minority or small business firm's information:** Please check the following information relevant to your firm: (See Instructions to Bidders, Paragraph 19 for definitions)

Virginia Small Business and Supplier Diversity Certification Number:_____

SWaM Certification Type:

Minority Business Firm	Yes___	No ____
Small Business Firm	Yes___	No ____
Women-Owned Firm	Yes___	No ____

The above information is requested for statistical purposes only. All bidders tendering responses will receive equal consideration for award.

3. **Safety:** The successful bidder shall abide by, and shall be subject to, the Fairfax County Construction Resolution, as adopted by the Fairfax County Board of Supervisors on December 8, 2003, and as modified and excerpted in the Instruction to Bidders (see, Paragraph 21 the "Safety Resolution").

Bidder's disclosure pursuant to Safety Resolution (as stated above):

_____

_____

(additional pages may be attached, as necessary for a complete response by the bidder)

4. **Incorporation by Reference:** This solicitation and any contract awarded hereunder are subject to all Laws and Regulations (as defined in the Instructions to Bidders).

5. **List of public jurisdictions:** (States and District of Columbia) in which Bidder performed work in the 3 years prior to bid submission:

_____

_____

(additional pages may be attached, as necessary for a complete response by the bidder)

6. **Bidder Affirmations and Certifications:** By signing this Bid, the undersigned bidder hereby confirms, certifies, and agrees as follows:

(a) the undersigned has not received or been the subject of safety violations in the three (3) years prior to this Bid Submission and is in compliance with the requirements of Item 3 above.

(b) neither the undersigned Bidder nor any employee of the Bidder who will have direct contact with students has been convicted of a felony or any offense involving the sexual molestation or physical or sexual abuse or rape of a child;

(c) unless expressly disclosed in an attachment to this Bid on the Bidder's letterhead stationery, neither the undersigned Bidder nor any employee of the Bidder who will have direct contact with students has been convicted of a crime of moral turpitude;

(d) the undersigned does not and shall not during the performance of the contract for goods and services in the Commonwealth of Virginia; knowingly employ an unauthorized alien as defined in the Federal Immigration Reform and Control Act of 1986; and

(e) The Owner reserves the right to accept or reject any proposed subcontractor or supplier.

The undersigned Bidder acknowledges and agrees that it will be deemed to have made each of the above certifications at and effective as of Bidder's execution of this Bid Form and upon acceptance of any Purchase Order, Task Order or Notice to Proceed issued to Bidder by the Owner under any contract awarded in response to this IFB.

_____
Contractor

_____
Address

_____
Principal's Name (Signature)

_____
Principal's Name (Printed)

_____
Fairfax County Business/Professional Occupation License Number (BPOL)#

_____
Email Address

_____
Telephone Number

_____
Facsimile Number

_____
Title

_____
Virginia Contractors License No.

_____
Virginia State Corporation Commission Identification Number (or attach an explanation as to why such is not required pursuant to Virginia Code § 2.2-4311.2) END OF SECTION

(BIDS $100,000 OR HIGHER)

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, _____ of _____ (hereinafter called the "Principal"), and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in _____, and authorized to do business in the Commonwealth of Virginia as a surety (hereinafter called the "Surety"), are held and firmly bound unto FAIRFAX COUNTY SCHOOL BOARD (hereinafter called the "Obligee") in the full and just sum which is equal to 5% of the total amount of the Principal's Bid (as that term is defined below), as submitted to the Obligee (such total amount referred to herein as the "Total Bid"), in good and lawful money of the United States of America, to be paid upon demand of the Obligee, for the payment of such sum well and truly to be made, the Principal and the Surety bind themselves, their respective successors, and permitted assigns, jointly and severally and firmly by these presents. The Total Bid is the aggregate amount (including amounts set forth with respect to any and all Alternates) set forth on the Principal's Bid Form for performance of the work described below, as submitted to and maintained by the Obligee (such Bid Form referred to herein as the "Bid"). The Surety hereby acknowledges and agrees that the Bid shall be deemed to be incorporated by reference in this Bid Bond to the same extent as if set forth fully herein.
WHEREAS, the Principal intends to submit, or has submitted to the Obligee, a Bid for the Principal to perform work for the Obligee, designated as:

_____

_____

(hereinafter called the "Project") and,

WHEREAS, the Principal desires to provide this Bid Bond in lieu of a certified check or cash escrow otherwise required to accompany the Principal's Bid.

NOW THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT, if the Bid be accepted by the Obligee, and if the Principal shall, within ten days after the date of receipt of a written Notice of Award from the Obligee or any agency or department thereof, (i) execute a Contract in accordance with the Bid and upon the terms, conditions and price set forth therein, in the form and manner required by the Obligee, (ii) execute a sufficient and satisfactory Performance Bond in the amount of 100% of the total Contract Sum and a sufficient and satisfactory Payment Bond in the amount of 100% of the total Contract Sum, each payable to the Obligee, on a form prescribed by Obligee and with a surety satisfactory to Obligee, and (iii) provide the Obligee with copies of all required insurance policies, then this obligation is to be void; otherwise this obligation shall be and remain in full force and in the event of the failure of any or all of the foregoing requirements to be satisfied within the time period specified above, the Principal and the Surety immediately shall pay to the Obligee, upon demand, the lesser of: (a) the amount hereof and (b) the difference between the Bid and the next low bid for the Project, in each case in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.
Based upon the Surety's present knowledge and information, the Surety knows of no reason why it would not issue payment and performance bonds on behalf of the Principal for the above-referenced Project. The foregoing statement shall not be construed as a commitment on the part of the Surety to issue either or both of such bonds on behalf of the Principal.

The obligations evidenced hereby shall constitute the joint and several obligations of the Principal, the Surety, and their respective successors and permitted assigns.

Unless the context requires otherwise, capitalized terms not otherwise defined in this Bond shall have the meanings assigned to them in the Contract Documents.

BID BOND

IN WITNESS WHEREOF, we have hereunto set our signatures and seals this ____ day of _____, 20___, all pursuant to due authorization.

_____
Principal

(SEAL)

By: _____
Name: _____
Title: _____

Address: _____
_____
_____

_____
Surety

(SEAL)

By: _____
Attorney-in-Fact (Attach Copy of Power of Attorney)

Name: _____
Title: _____

Address: _____
_____
_____

Countersigned for the
Commonwealth of Virginia:

By: _____
Resident Agent

Address: _____
_____
_____

END OF SECTION

(BIDS $100,000 OR HIGHER)

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we, _____ of (hereinafter called the "Principal"), and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in the Commonwealth of Virginia as a surety (hereinafter called the "Surety"), are held and firmly bound unto the FAIRFAX COUNTY SCHOOL BOARD (hereinafter called the "Obligee") in the sum of _____ Dollars ($_____) lawful money of the United States of America for the payment of which well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally and firmly by these presents, to perform all Work in accordance with the requirements of the Contract Documents for the Project.

WHEREAS, the Principal has entered into a certain written agreement with the Obligee, dated as of the ____ day of _____, 20___, (hereinafter called the "Contract"), for _____ _____, which Contract is by reference made a part hereof;

WHEREAS, the Principal is obligated to furnish security with respect to its obligation to perform the work to be performed under the Contract; and

WHEREAS, the Principal desires to furnish this Performance Bond in lieu of a certified check or cash escrow otherwise required to be provided to the Obligee.

NOW THEREFORE, THE CONDITIONS OF THE ABOVE OBLIGATIONS ARE SUCH THAT, if the Principal and its successors or assigns, or any of them shall:

> Well and truly and in good, sufficient, and workmanlike manner perform or cause to be performed the Contract, and each and every of the covenants, promises, agreements, warranties, and provisions to be performed by the Principal set forth therein, in strict conformity with the plans and specifications, and complete the same within the time period specified therein, all as may be amended from time to time by the parties thereto, and fully indemnify and save harmless the Obligee from all costs and damages which it may suffer by reason of the Principal's failure to do so and fully reimburse and repay the Obligee all costs and expenses which it may incur in making good any such default, then these obligations shall be null and void, otherwise they shall remain in full force and effect.

PROVIDED, HOWEVER, that this bond is subject to the following conditions and limitations:

(a) In no event shall the Surety, or its successors or assigns be liable hereunder for a greater sum than the amount of this bond.

(b) No action on this bond shall be brought unless within one year after: (i) completion of the Contract, including the expiration of all warranties and guarantees; or (ii) discovery of the defect or breach of warranty, if the action be for such, in all other cases.

The Surety, for value received, on behalf of itself and its successors and assigns, hereby stipulates and agrees that the obligations of the Surety and of its successors and assigns under this bond shall not in any manner be impaired or affected by: (a) any extension of time, modification, omission, addition or

amendment of or to the Contract or the work to be performed thereunder; (b) any payment thereunder before the time required therein; (c) any waiver of any provision thereof; or (d) any assignment, subletting or other transfer of all or of any part thereof or of any work to be performed or of any moneys due or to become due thereunder; and the Surety, for itself and its successors and assigns, does hereby waive any right to receive notice of any and all of such extensions, modifications, omissions, additions, amendments, payments, waivers, assignments, subcontracts and transfers.

The Surety hereby stipulates and agrees that, in the event that the Obligee declares the Principal to be in default, the Surety will promptly, at the Obligee's election: (a) perform and complete the work to be performed under the Contract in accordance with the terms, conditions and covenants set forth therein with a duly licensed and qualified contractor designated by Obligee; (b) obtain bids from qualified contractors for completing the work to be performed under the Contract in accordance with the terms, conditions and covenants set forth therein and, upon determination by the Obligee and the Surety of the lowest responsible and responsible bidder, (i) arrange for a contract between such bidder and the Obligee and (ii) make funds available directly to the Obligee, or to such contractor(s) as the Obligee shall designate, to pay the costs of completion less the balance of the contract price as such may have been adjusted by change order (such amount, including other costs and damages for which the Surety may be liable hereunder, not to exceed the penal sum set forth in the first paragraph hereof); or (c) remedy the default. The Surety further stipulates and agrees that, within 45 days after its receipt of written notice from the Obligee specifying the Obligee's election of (a), (b) or (c) above, the Surety shall have resumed performance of the work or shall have caused the performance of the work to have been resumed, in accordance with the Obligee's election. In the event the Surety fails to resume the Work within such 45 day period, the Obligee may elect to perform or arrange for the performance of the Work at the sole cost and expense of the Surety in addition to any other rights and remedies available to Obligee. As employed herein, the phrases (i) "balance of the contract price" shall mean the total amount payable by the Obligee to the Principal under the Contract after all proper adjustments have been made, less the aggregate of all amounts paid by the Obligee to the Principal thereunder and (ii) "resume the Work" shall mean the commencement and diligent performance of actual work activities at the site, as demonstrated by discernable daily progress at the rate contemplated by the Contract. All payments to be made by the Surety hereunder shall be paid within thirty (30) days after the Surety's receipt of a request or demand therefor.

The Obligee's omission to call upon the Surety in any instance shall in no event release the Surety from any obligation hereunder.

All notices, requests, demands and other communications which are provided hereunder, shall be in writing and shall be deemed to have been duly given upon the hand delivery thereof during business hours, or upon the earlier of receipt or three (3) days after posting by registered mail or certified mail, return receipt requested, or on the next business day following delivery to a reliable overnight delivery service, if to the Principal or the Obligee, to the addresses set forth in the Contract, and if to the Surety, to the address set forth beneath its signature.

The obligations evidenced hereby shall constitute the joint and several obligations of the Contractor, the Surety, and their respective heirs, executors, administrators, successors and assigns.

Unless the context requires otherwise, capitalized terms not otherwise defined in this Bond shall have the meanings assigned to them in the Contract Documents.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the Principal and Surety have caused this Performance Bond to be signed and sealed by their duly authorized representatives as of the ____ day of _____, 20___.

_____
Principal

(SEAL)

By: _____
Name: _____
Title: _____

Address: _____
_____
_____

_____
Surety

(SEAL)

By: _____
Attorney-in-Fact (Attach Copy of Power of Attorney)

Name: _____
Title: _____

Address: _____
_____
_____

Countersigned for the
Commonwealth of Virginia:

By: _____
Resident Agent

Address: _____
_____
_____

END OF SECTION

(BIDS $100,000 OR HIGHER)

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we, _____ of (hereinafter called the "Principal"), and _____, a corporation created and existing under the laws of the State of _____, and having its principal office in the City of _____and authorized to transact business in the Commonwealth of Virginia as Surety (hereinafter called the "Surety)" are held and firmly bound unto FAIRFAX COUNTY SCHOOL BOARD (hereinafter called the "Obligee" in the sum of Dollars ($_____) lawful money of the United States of America, for the payment of which well and truly to be made, the said Principal binds itself and its successors and assigns, and the said Surety binds itself and its successors and assigns, all jointly and severally, firmly by these presents to pay for all labor performed and material furnished in accordance with the Contract Documents for the Project.

WHEREAS, the Principal has entered into a certain written agreement with the Obligee, dated as of the ____ day of _____, 20___ (hereinafter called the "Contract)", for _____, which Contract is by reference made a part hereof.

WHEREAS, the Principal is obligated to furnish security with respect to its obligation to pay for all labor performed and material furnished pursuant to the Contract; and

WHEREAS, the Principal desires to furnish this Payment Bond in lieu of a certified check or cash escrow otherwise required to be provided to the Obligee.

NOW, THEREFORE, THE CONDITIONS OF THE ABOVE OBLIGATIONS ARE SUCH THAT, if the Principal and its successors or assigns, or any or either of them shall:

Pay or cause to be paid the wages and compensation for labor performed and services rendered of all persons engaged in the prosecution of the work provided for therein, whether such persons be agents, servants or employees of the Principal, and of its successors or assigns, or of any subcontractor or any assignee thereof, including all persons so engaged who perform the work of laborers or of mechanics regardless of any contractual relationship between the Principal, or its assigns, or any subcontractor or any assignee thereof, and such laborers or mechanics, but not including office employees not regularly stationed at the site of the work, and further, shall pay or cause to be paid all lawful claims of subcontractors and of materialmen and other third persons arising out of or in connection with the Contract and the work, labor, services, supplies and materials furnished in and about the performance and completion thereof, then these obligations shall be null and void, otherwise they shall remain in full force and effect.

PROVIDED, however, that this bond is subject to the following conditions and limitations:

a. All persons who have performed or rendered services, as aforesaid, all subcontractors, and all persons, firms, corporations, including materialmen and third persons, as aforesaid, furnishing work, labor, services, supplies and material under or in connection with the Contract or in or about the performance and completion thereof, shall have a direct right of action (subject to the prior right of the Obligee under any claim which it may assert against the Principal and its successors, and assigns and/or the Surety and its successors and assigns) against the Principal and its successors, and assigns and/or the Surety and its successors and assigns on this bond, which right of action shall be asserted in proceedings instituted in the State in which such work, labor, services,

supplies or material was performed, rendered or furnished, or where work, labor, services, supplies or material has been performed, rendered or furnished, as aforesaid, in more than one State, then in any such State. Insofar as permitted by the laws of such State, such right of action shall be asserted in a proceeding instituted in the name of the Obligee to the use and benefit of the person, firm or corporation instituting such action and of all other persons, firms and corporations having claims hereunder, and any other person, firm or corporation having a claim hereunder shall have the right to be made a party to such proceedings (but not later than one year after the performance of the Contract including the expiration of any warranty or guarantee) and to have such claim adjudicated in such action and judgment tendered thereof. Prior to the institution of such a proceeding by a person, firm or corporation in the name of the Obligee, as aforesaid, such person, firm or corporation shall furnish the Obligee with a bond of indemnity for costs, which bond shall be in a form and in an amount satisfactory to the Obligee.

b. Neither the Surety nor its successors or assigns shall be liable hereunder for any damages or compensation recoverable under any worker's compensation or employer's liability statute.

c. In no event shall the Surety, or its successors or assigns be liable hereunder for a greater sum than the amount of this bond, or subject to any suit, action or proceeding thereon that is instituted by any person, firm or corporation under the provisions of the above section(s), later than one year after such person last performed labor or last furnished or supplied materials.

And the Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligations of the Surety and of its successors and assigns, and this bond shall in no way be impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by a waiver of any provision thereof, or by an assignment, subletting or other transfer thereof, or of any part thereof, or of any work to be performed or of any moneys due or to become due thereunder; and the Surety, for itself and its successors and assigns, does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby stipulates and agrees that any and all things done and omitted to be done by and in relation to executors, administrators, successors, assignees, subcontractors, and other transferees, shall have the same effect as to the Surety and its successors and assigns, as though done or omitted to be done by and in relation to the Principal.

The Principal, for itself and its successors and assigns, and the Surety, for itself and its successors and assigns, do hereby expressly waive any objection that might be interposed as to the right of the Obligee to require a bond containing the foregoing provisions, and they do hereby further expressly waive any defense which they or either of them might interpose to an action brought hereon by any person, firm, or corporation, including subcontractors, materialmen and third persons, for work, labor services, supplies or material, performed, rendered or furnished as aforesaid, upon the ground that there is no law authorizing the Obligee to require the foregoing provisions to be placed in this bond.

Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Principal shall promptly furnish a copy of this Bond or shall permit a copy to be made on behalf of such potential beneficiary.

The obligations evidenced hereby shall constitute the joint and several obligations of the Contractor, the Surety, and their respective heirs, executors, administrators, successors and assigns.

PAYMENT BOND

Unless the context requires otherwise, capitalized terms not otherwise defined in this Bond shall have the meanings assigned to them in the Contract Documents.

IN WITNESS WHEREOF, we have hereunto set our signatures and seals this ____ day of _____, 20___, all pursuant to due authorization.

_____
Principal

(SEAL)

By: _____
Name: _____
Title: _____

Address: _____
_____
_____

_____
Surety

(SEAL)

By: _____
Attorney-in-Fact (Attach Copy of Power of Attorney)

Name: _____
Title: _____

Address: _____
_____
_____

Countersigned for the
Commonwealth of Virginia:

By: _____
Resident Agent

Address: _____
_____
_____

END OF SECTION

GENERAL CONDITIONS

1. DEFINITIONS:

A. Architect. The duly licensed individual or entity who has been engaged by the Owner to observe performance of the Work and to consult with and advise the Owner during the construction process. As employed herein, the term "Architect" may refer to an individual, an organization or to the Architect's authorized representative.

B. Change Order. A written order to the Contractor signed by the Owner, the Architect, and the Contractor, which authorizes a change in the Work, an adjustment to the Contract Sum, and/or an adjustment to the Contract Period. The latest edition of AIA Standard Form G701 shall be utilized.

C. Construction Schedule. The schedule for completion of the Work. The Construction Schedule shall be developed utilizing a Critical Path method of scheduling, indicating time periods allotted for the performance of all constituent parts of the Work within the Contract Period.

D. Contract or Contract Documents. The terms "Contract" and "Contract Documents" shall be used interchangeably herein and shall consist of the following:

1. The signed Agreement

2. The General Conditions of the Contract, which appear herein;

3. The Drawings and Specifications;

4. The Supplementary Conditions;

5. Any Addenda issued prior to execution of the Agreement;

6. The Notice of Award issued by the Owner to the Contractor;

7. The Notice to Proceed issued by the Owner to the Contractor;

8. Any modifications which are issued subsequent to the execution of the Agreement and which may take the form of a Work Order, a Change Order, or written interpretations issued by the Architect;

9. The Contractor's Payment and Performance Bonds;

10. The Bidding Documents, which shall include the Contractor's completed Bid Proposal Form and the Instructions to Bidders; and

11. All provisions required by Law or Regulation to be incorporated herein, regardless of whether any such provision is referred to or set forth expressly in these Contract Documents.

E. Contract Period. The period of time allotted in the Contract Documents for completion of the Work, as such period may be adjusted from time to time in the manner prescribed herein.

F. Contract Sum. The total amount payable to the Contractor for performance of the Work. The Contract Sum is stated in the Contract Documents and shall be subject to adjustments in the manner specified herein.

G. Contractor. The corporation, limited liability company, partnership or other person or entity that contracts with the Owner to perform the Work. As employed herein, the term "Contractor" may refer to an individual, an organization, or to the Contractor's authorized representative.

H. Critical Path. The logical and necessary sequence through which all Work items must be completed within their respective timeframes or the completion date for the Project will change. A delay in the completion of any Work item that is on the Critical Path necessarily causes a corresponding delay to the Date of Substantial Completion.

I. Date of Final Completion. The date certified by the Owner/Architect as the date upon which the Work is completely finished, which event shall be achieved by the Contractor within the time period specified in Schedule of Completion. Work consisting of the completion of punch-list items, submission of O&M Manuals, any and all other Contract requirements being completed by the Contractor.

J. Date of Substantial Completion. The date certified by the Owner/Architect as the date upon which the Work has been sufficiently completed to allow the Work to be utilized by the Owner for the purpose for which it was intended. Such event shall be achieved by the Contractor within the time period specified in Schedule of Completion.

K. Day. The term "day" shall mean "calendar day."

L. Defective. An item described herein as "defective" shall be deemed to be unsatisfactory, faulty, or deficient in that it does not conform to the requirements of the Contract Documents, or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to the Date of Final Completion of the Work (unless responsibility for the protection thereof has been assumed by the Owner as of an earlier date).

M. Director, Office of Facilities Management. The official in charge of day to day construction matters for the Owner. The Director may designate a representative to act on his or her behalf.

N. Float. The period of time between the early start date and the late start date, or the early finish date and the late finish date of any of the activities set forth on the Construction Schedule. The Owner shall have and retain exclusive ownership of the Float.

O. Laws and/or Regulations. Any and all federal, state, and local laws, rules, regulations, ordinances, codes, and/or orders of any and all governmental bodies, agencies, authorities, and/or courts, which are applicable to the Work (or any aspect thereof) and are in effect at any time or from time to time during the Contract Period.

P. Notice. Notice shall mean written notice. Written notice shall be deemed to have been duly served on the Contractor if delivered by U.S. Mail, hand delivery, or facsimile transmission to the Contractor's office at the Project or to the business address or fax number of the Contractor as stated in its Bid Form Proposal; or if delivered in person to the Contractor, to the Contractor's foreman or superintendent for the Project, or any officer or director of the Contractor. Unless otherwise specified herein, Notice shall be deemed to have been duly served on the Owner if delivered by U.S. Mail, hand delivery, or facsimile transmission (with a duplicate copy transmitted by another means of delivery authorized hereunder) to the Office of Facilities Management, Fairfax County Public Schools, 5025 Sideburn Road, Fairfax, Virginia 22030, fax number (703) 239-0462.

Q. Notice to Proceed. A written notice from the Owner to the Contractor, which gives consent for commencement of the Work. Unless otherwise provided, Work shall commence on the date specified in the Notice to Proceed.

R. Overhead. All costs of administration, field office and home office costs (including extended costs), general superintendence, office engineering and estimating costs, other required insurance, materials used in temporary structures (not including form work), additional premiums on the Performance and Payment Bonds of the Contractor, the use of small tools, scheduling costs, cumulative impact costs and all other costs incidental to the performance of a change in the Work or to the cost of doing business. Small tools are defined as any tool with a replacement value less than $1,000.

S. Owner. The School Board of Fairfax County, Virginia, its authorized representatives and employees.

T. Project. The entire improvement of which this Contract and the Work contemplated hereby forms a part. The Project may include construction and/or other activities that are to be performed by the Owner or by one or more Separate Contractors.

U. Separate Contractor. Any corporation, limited liability company, partnership or other person or entity that contracts with the Owner to perform one or more portions of the Project, other than the Work.

V. Shop Drawings. All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for the Contractor and are submitted by the Contractor to illustrate a portion of the Work. Shop Drawings are not Contract Documents.

W. Site. The area upon or in which the Contractor's operations are performed and such other areas adjacent thereto as may be designated as such by the Architect. The Site may be shared by the Contractor with the Owner and with Separate Contractors and their subcontractors.

X. Subcontractor. Any corporation, limited liability company, partnership or other person or entity, other than an employee of the Contractor, who contracts with the Contractor to furnish or who actually furnishes labor, materials, services or equipment, or any combination thereof to the Contractor in connection with the Work.

Y. Submittal Schedule. A schedule for submission to the Architect of all required shop drawings, equipment data, and the like, which reflects lead times of critical submittals and is coordinated with the Construction Schedule for timely progress.

Z. Sub-Subcontractor. Any corporation, limited liability company, partnership or other person or entity, other than an employee of a Subcontractor, who contracts with a Subcontractor to furnish, or who actually furnishes labor, materials, service or equipment, or any combination thereof to a Subcontractor in connection with the Work.

AA. Surety. Any entity that has executed as Surety the Contractor's performance and/or payment bonds securing performance of the Work contemplated by this Contract and/or providing for protection of claimants who have and fulfill contracts to supply labor or materials to the Contractor in connection with the Work.

BB. Work. Everything explicitly or implicitly required to be furnished or performed under the Contract Documents. The Work may represent the whole, or a necessary and interdependent part of, the Project.

Number and Gender of Words. Whenever the Contract so admits or requires, all references to one number shall be deemed to extend to and include the other number, whether singular of plural, and the use of any gender shall be applicable to all genders.

2. INDEMNIFICATION:

The Contractor hereby assumes all liability for and agrees to indemnify and hold harmless the Owner and its Members, officers, authorized representatives and employees (each of whom shall be referred to herein as an "Indemnified Party") from and against any and all claims, losses, costs, damages, penalties, liabilities and fees (including reasonable attorneys' fees) and expenses resulting from: (i) any material breach of the representations, warranties, covenants and agreements of the Contractor contained in the Contract Documents; (ii) any injuries to persons or property caused by the negligence or other wrongful conduct of the Contractor, any Subcontractor, or any of its or their respective employees or authorized representatives; (iii) any claims filed by the Contractor (or by a Subcontractor, if permitted by law) that are adjudicated in favor of the Owner; or (iv) any other claim arising in any other manner-out of or in connection with the performance of this Contract by or on behalf of the Contractor.

Notwithstanding the foregoing, the Contractor will in no event be obligated hereunder to indemnify or hold harmless any Indemnified Party against liability for damage arising out of bodily injury to persons or damage to property suffered in the course of the Work, caused by or resulting solely from the negligence of such Indemnified Party.

3. CONFLICT OF INTEREST:

The provisions of the State and Local Government Conflict of Interests Act (Va. Code § 2.2-3100, *et seq.*) and Article IV of the Virginia Public Procurement Act entitle "Ethics in Public Contracting" (Va. Code § 2.2-4367 *et seq.*) are incorporated herein by reference. The Contractor shall incorporate the above conflict-of-interest clause in each subcontract entered into hereunder.

4. EXAMINATION OF SITE:

Bidders are required to visit the site, compare the Drawings and Specifications with any work in place, and inform themselves of all conditions, including other work, if any, being performed. Failure to visit the site in no way relieves the successful bidder from the necessity of furnishing any materials or performing any work that may be required to complete work in accordance with Drawings and Specifications without additional cost to the Owner.

5. INSURANCE:

A. Contractor's Statutory and Legal Liability Insurance

During the Contract Period, the Contractor shall, at its own expense, purchase and maintain insurance to provide coverage for claims resulting from the Contractor's performance of the work. Such coverage shall extend to work performance by Subcontractors, persons or organizations directly or indirectly hired by the Contractor or any subcontractor in connection with the work, or any other person or organization who may cause liability to be incurred by the Contractor or any Subcontractor. Such coverage shall include, but not be limited to, the following:

1. Claims arising under workers' compensation, disability, or other related benefits programs.

2. Claims resulting from bodily injury, occupational illness or death of any employees performing the work.

3. Claims resulting from bodily injury, illness disease or death of any persons in contact with the work, but who are not engaged as employees.

4. Claims arising under personal injury liability coverage for injury to any employees, which are directly or indirectly attributable to his employment for performance of the work.

5. Claims arising under personal injury liability coverage for injury to any person not an employee which are attributable to performance of the work.

6. Claims arising for damage or destruction of tangible property, including loss of use of the affected property as a result.

7. Claims arising from pollution, including Loading and Unloading Cargo, Cargo In-transit, Site Pollution Clean-up Operations, and On-Going Contamination.

B. During the term of the Contract, the Contractor must maintain the following insurance with companies authorized to do business in Virginia. The Owner shall be designated on each policy as "The Fairfax County School Board" as an additional insured except for workers' compensation.

1. Workers Compensation including Occupational Disease and Employer's Liability Insurance: Statutory coverage as required by the District of Columbia, Maryland, and Virginia Workers Compensation Law, including provision for voluntary D.C. benefits as required in labor union agreements.

2. Employer's Liability:

Bodily Injury by Accident -- $100,000 Each Accident
Bodily Injury by Disease -- $500,000 Policy Limit
Bodily Injury by Disease -- $100,000 Each Employee

3. Commercial General Liability Insurance written on ISO occurrence form CG 00 01 10 01 (or a substitute form providing equivalent coverage) with limits of $1 million per occurrence and $2 million aggregate per project to include the following:

Contractual liability as required by the indemnification provision of Paragraph 1.
Personal injury liability, including offenses related to employment.
Coverage of explosion, collapse, or underground hazards.
Broad form property damage liability, including completed operations coverage.

4. Business Auto Liability Insurance: including owned, non-owned and hired vehicles with policy limits of $1,000,000 combined single limit per accident.

5. Pollution Liability Insurance covering the Contractor's completed operations. This insurance must include sudden and gradual coverage for third-party liability including defense costs and completed operations. The coverage must be maintained during the term of the contract and at least three years following ins completion/termination.

6. Umbrella/Excess Liability Insurance with coverage limits of $5,000,000.

C. Additional Requirements:

1. The limits of liability of the insurance described may be superseded if the limits prescribed by law are greater.

2. If any insurance has been issued on a "claims made" basis, then Contractor must comply with either of the following conditions.

   a. Provide insurance for all required coverage for a period of two (2) years after final completion. Such coverage shall be subject to a retroactive date that is not later than the commencement of performance under the Contract, or

   b. Procure insurance for the extended reporting period endorsement for the policy or policies in force during the term of the Contract.

3. Notice of Insurance: Proof of insurance for each type of coverage listed herein shall be provided within ten (10) days after the Contractor's receipt of the Award Letter, and no work shall proceed unless all such insurance is in effect. The Contractor shall not allow any Subcontractor to commence work on its subcontract until all such insurance of the Subcontractor has been obtained and approved by the Contractor and found to be in accordance with the Contract. The Contractor certifies by commencement of the Work that its insurance and that of its Subcontractors is in effect and meets the requirements set forth herein.

4. Notice of Cancellation: The Contractor will give thirty (30) days prior written notice to the Owner if the policies are to be terminated or if any changes are made during the life of the Contract which will affect in any way the insurance requirements in the contract.

5. Copies of Insurance Policies: Upon demand, the Contractor shall provide the Owner with a copy of each policy, which the Contractor and each of its Subcontractors carry to meet the insurance requirements of the Contract, together with receipted bills evidencing proof of premium payment.

6. Owner's Liability Insurance: The Owner may, at its own expense, purchase and maintain its own liability insurance to protect against claims which may arise in connection with the work, or the Owner may self-insure such risks.

7. No Waiver: Nothing contained herein shall have the effect of waiving or shall be deemed to affect a waiver of the Owner's sovereign immunity under law.

6. COMPLIANCE WITH LAWS; PERMITS, FEES, AND NOTICES:

The successful bidder shall be required to comply with all local, state and federal laws, rules, regulations and ordinances (collectively, the "Laws and Regulations") applicable to the Contract and to the work contemplated thereby. The successful bidder shall be required to obtain, at its expense, all permits, licenses and other authorizations necessary for the performance of the services, except that the Owner shall obtain, at its expense, all Building Permits that are required for completion of the Project. The successful bidder shall be responsible for giving all required notices and certifications, and for complying with all laws, ordinances, rules, regulations and directives of any public authority bearing on the performance of the work, regardless of whether those notices, certifications, laws, ordinances, rules, regulations and directives are expressly referenced in the Contract.

7. OCCUPIED AREA:

A. The Contractor hereby certifies that: (i) neither the Contractor nor any employee of the Contractor who will have direct contact with students has been convicted of a felony or any offense involving the sexual molestation or physical or sexual abuse or rape of a child; and (ii) absent prior Notice to the Owner, neither the Contractor nor any employee of the Contractor who will have direct contact with students has been convicted of a crime of moral turpitude. The foregoing certification shall be binding upon the Contractor throughout the Contract Period and the Contractor hereby covenants and agrees to provide the Owner with immediate Notice of any event or circumstance that renders such certification untrue. The Contractor hereby covenants and agrees that it will require this certification to be included in every subcontract of every tier in order that the provisions contained herein will be binding upon each Subcontractor and Sub-subcontractor. The Contractor will ensure that no worker shall perform Work in occupied areas during school hours unless prior written approval has been granted by the Owner and proper safety precautions have been exercised to isolate the area of the Work.

B. Alcoholic beverages, illegal drugs, and weapons are prohibited on the Site and shall constitute grounds for immediate removal from the Site of the Project. The Contractor shall ensure that neither its employees nor those of any Subcontractor shall fraternize in any manner with any student of Fairfax County Public Schools at the Site of the Work. The Owner shall have the right to remove from the job Site any person whose presence the Owner deems detrimental to the best interests of the Fairfax County Public Schools. Any individual who is removed from the Site pursuant to this paragraph may not return to such Site or to that of any other project of Owner without the prior written permission of the Owner.

C. Drug-Free Workplace. During the performance of the Contract, the Contractor agrees to (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such

prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor. As employed herein, the term "drug-free workplace" shall mean each site for the performance of work hereunder.

8. CLEANING:

The Contractor shall be totally responsible for periodic cleaning up of the building and premises daily. In addition to general broom cleaning, the Contractor shall remove all refuse, waste materials and debris of any kind regardless as to who may have left same. All such refuse shall be removed from the property of the Owner and disposed of in a legal manner to the end that at all times the building and premises shall present a neat, orderly and workmanlike appearance. The definition of "periodic" shall mean - "as necessary and/or at the direction of the Owner or his representative."

9. SUBCONTRACTORS:

Unless otherwise specified in the Contract Documents, within ten (10) days after the award of the Contract, the Contractor must submit a written statement to the Owner setting forth the name and address, and telephone number of each proposed Subcontractor and Sub-subcontractor and the portion of the Work and materials for which each such Subcontractor or Sub-subcontractor is responsible.

10. ASSIGNMENT AND LEGAL REPRESENTATIVES:

The Contract Documents shall not be assigned, sublet or transferred, in whole or in part, by operation of law or otherwise, by either of the parties hereto except with the prior written consent of the other. Unless specifically stated to the contrary in any written consent to an assignment, no assignment shall operate to release or discharge the assignor from any duty or responsibility under this Agreement.

11. TIME OF START:

The Contractor shall commence work within ten (10) calendar days after the date stated as the date to proceed in the Notice to Proceed. All work shall be performed during regular school business hours (7am – 5pm) only. Work performed outside of regular school business hours must be approved by the FCPS project manager or an FCPS representative prior to the work being performed.

12. EXTENSION OF TIME - NO WAIVER:

The Contractor shall be entitled to an extension of time for delay in completion of the Work only if obstructed or delayed in the commencement, prosecution or completion of any part of the work by any act or delay of the Owner, or by riot, insurrection, war, pestilence, acts of public authorities, fire, earthquakes, or by strikes, or other causes, which causes of delay mentioned in this Paragraph, in the opinion of the Owner, are entirely beyond the expectation and control of the Contractor. In such event, the period specified in any Notice to Proceed or Purchase Order for the completion of the work shall be extended by such time as shall be determined by the Owner.

The parties agree that no extension beyond the date of completion fixed by the terms of the Contract shall be effective unless granted in writing and signed by the Owner.

13. LIQUIDATED DAMAGES:

The Owner and the Contractor hereby acknowledge and agree that time is of the essence with respect to this Contract and in the event the Contractor fails to complete any work within the established timeframe, the Owner will incur actual monetary damage. The amount of **$500.00** per day is set forth as the liquidated damages for each day that the time consumed in completing the work exceeds the time allowed. This amount shall in no event be considered as a penalty or otherwise than as the liquidated and adjusted damages to the Owner because of the delay.

14. UNTIMELY PERFORMANCE BY CONTRACTOR:

The Owner and the Contractor hereby acknowledge and agree that time is of the essence with respect to the performance of the Work. In the event the Contractor fails to complete the Work within the established timeframe, the Owner as well as Community Users will incur actual and direct harm. This includes, but is not limited to, the disruption or loss of scheduled classes, disruption or loss of school activities, loss of revenue from these cancelled activities, disruption or loss of intermural academic and athletic tournaments, loss of revenue from these cancelled events, disruption or loss of scheduled community use of the schools and facilities.

In addition to the Owner's assessment of liquidated damages, unapproved project delays also can result in the Contractor's loss of eligibility for award of future FCPS Office of Facilities Management projects for a period of three years or more as determined by FCPS Office of Facilities Management.

15. PROGRESS SCHEDULE:

Prior to the first request for payment, submit Progress Schedule in such form as to readily indicate status of work as planned, scheduled, and so arranged so that at weekly intervals it may be clearly determined whether actual state of work is in accord with schedule to Owner as indicate actual progress thereon weekly. Contractor shall update schedule to show substantial completion of project and final completion as necessary when delays or change orders are agreed upon and issued.

16. SCHEDULE OF COMPLETION:

A. All work shall be substantially completed and certified according to the following schedule:

1. Onsite work shall begin on Upon Receipt of the Notice to Proceed Letter.

2. Substantial Completion on or before June 6, 2025. *(See Definition)*

3. Final Completion on or before June 13, 2025. *(See Definition)*

B. Phasing of the project within the completion date will be jointly prepared by the Contractor, Office of Facilities Management, and school personnel to afford the least amount of disruption to school operations.

C. Construction and alteration will be performed while the building is in use and therefore, the Contractor shall give full cooperation to the school authorities in scheduling and

performing the work. Contractor shall give forty-eight hours advance written notice to school authorities when work is to be performed.

17. CONSTRUCTION SCHEDULES:

A. The Contractor, promptly after receipt of the Award Letter, shall prepare and submit to the Owner, for approval, a construction schedule for the Work. The Construction Schedule, as approved, shall not exceed the time limits provided in the Contract Documents, shall be revised at appropriate intervals as required by conditions of the Work and the Project, shall be related to the entire Project to the extent required by the Contract Documents and shall provide for the expeditious execution of the Work within the Contract Period.

B. The Contractor shall prepare and keep current, for the Owner's review and approval, a schedule of submittals which is coordinated with the Construction Schedule and is maintained both on the job site and available for the Owners review.

18. SHOP DRAWINGS:

A. The Contractor shall submit Shop Drawings and similar submittals required by the Contract Documents with reasonable promptness and in accordance with the Submittal Schedule as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

B. The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings or similar submittals until the Owner has approved the respective submittal. Such Work shall be performed in accordance with the approved submittals.

C. Delays in submission of shop drawings do not qualify for extension(s) in completion of the contract.

D. Contractor is responsible for reviewing shop drawings from subcontractors and suppliers to verify that they meet the project requirements prior to submitting them to the Owner. The Contractor shall mark on the shop drawings the name of the reviewer and the date reviewed.

E. Shop drawings must have an approval block, the FCPS project number, and the specification section reference or plan sheet number.

19. CHANGE ORDERS:

19.1 PRELIMINARY PROCEDURES:

A. Owner may initiate changes by submitting Proposed Modification to Contractor. Request will include:

1. Detailed description of the Change, Products, and location of the change in the Project.
2. Supplementary or revised Drawings and Specifications.
3. A specific period of time during which the requested price will be considered valid, which shall be 90 calendar days, unless otherwise stated.
4. The specific action to be initiated by the Contractor.
5. The amounts of the unit prices to be:

a. Those stated in the Agreement and the Bid Form.
b. Those mutually agreed upon between Owner and Contractor.

B. Contractor may initiate changes by submitting a written notice to Owner containing:

1. Description of the proposed changes.
2. Statement of the reason for making the changes.
3. Statement of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect on the work.
5. Documentation supporting any changes in Contract Sum or Contract Time, as appropriate.

C. All claims by the Contractor arising out of or relating to the performance of the work or any termination hereunder shall be made in writing and shall be decided by the Director of the Office of Facilities Management or his designated representative. All claims must be filed with the Office of Facilities Management within five (5) calendar days after sustaining the injury underlying the claim. Failure to comply with this provision shall constitute an absolute waiver of such claim. The Director or the Office of Facilities Management or his designated representative shall issue his written decision within thirty (30) days of his receipt of the written claim which decision shall be final.

19.2 DOCUMENTATION OF BIDS AND CLAIMS:

A. Support each quotation for a lump-sum bid, and for each unit price, which has not previously been established, with sufficient substantiating data to allow Owner to evaluate the quotation.

1. Bid costs attributable to labor shall be based upon labor rates for each category of personnel. A list of labor rates shall be submitted to the Owner for review and concurrence within 30 calendar days of the Notice to Proceed. See paragraph B2 below for allowable inclusions for establishment of labor rates.

B. Provide data for lump sum bids in accordance with the following criteria:

1. The Contractor's bid shall be itemized and segregated by labor, equipment, and materials for the various components of the Change in the Work (no aggregate labor total will be acceptable) and shall be accompanied by signed bids of any Subcontractors who shall perform any portion of the Change in the Work and of any entities who shall furnish materials or equipment for incorporation therein.

2. The portion of the bid relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, shall include anticipated gross wages of Job Site labor, including foremen, who shall be directly involved in the Change in the Work (for such time as they will be so involved), plus payroll costs (including premium costs of overtime labor, if overtime is authorized, Social Security, Federal or State unemployment insurance taxes and fringe benefits required by collective bargaining agreements entered into by the Contractor or any such Subcontractor in connection with such labor).

3. The portion of the bid relating to materials may include the reasonable anticipated direct costs to the Contractor or to any of its Subcontractors of materials shall be purchased for incorporation in the Change in the Work, plus transportation and applicable sales or use taxes.

4. The bid may further include the Contractor's and any of his Subcontractor's reasonable anticipated equipment rental costs, except small hand tools, in connection with the Change in the Work. For rented equipment an hourly rental rate shall be used which shall be determined by using the monthly rental rates taken from the current edition of the Rental Rate Blue Book for construction Equipment and dividing it by 176. An allowance shall be made for operating costs for each and every hour the equipment is actually operating in accordance with the rates listed in the aforesaid Rental Book. The Contractor shall be allowed no more than 65% of the rental rate on Contractor owned equipment.

5. Base Cost is defined as the total of labor, material, and equipment rentals as described in Subparagraphs 17.2.B3 and 17.2.B4. The actual net cost in money to the Owner for the Change in the Work shall be computed as follows:

   a. Contractor overhead and profit: If the Contractor performs the Change in the Work, his compensation shall be the Base Costs as described above, plus a mark-up of 20% on Base Costs less than or equal to $10,000. If the Base Costs exceed $10,000, his compensation shall be the Base Cost, plus a mark-up of 20% on Base Costs less than or equal to $10,000, and a mark-up of 15% on Base Costs above $10,000.

   b. Subcontractor overhead and profit: If the work is performed by a Subcontractor, his compensation shall be the Base Costs as described above plus a mark-up as described in Paragraph 5.a. above for overhead and profit. The Contractor's compensation shall be a mark-up of ten percent (10%) of the Subcontractors Base Costs.

   c. Sub-subcontractor overhead and profit: If the work is performed by a Sub-subcontractor, his compensation shall be the Base Costs as herein described plus a mark-up as described in paragraph 5.a. above for overhead and profit. The Subcontractors compensation shall be a mark-up of ten percent (10%) of the Sub-subcontractor's Base Costs for his overhead. The Contractor's compensation will be a mark-up of ten percent (10%) of the Sub-subcontractor Base Costs.

6. The mark-up on the cost of labor, materials, and equipment described in above Paragraphs 5.a., 5.b., and 5.c. above shall compensate the Contractor, Subcontractor or Sub-subcontractor for all indirect costs associated with or relating to the Change in the Work including, but not limited to, labor and/or equipment inefficiency, changes in sequence, delays, interference, impact on unchanged work, gross receipts tax, superintendent, small tools, reproduction, administration, insurance, unrelated safety requirements, temporary structures and offices, all other general and administrative, home office, and field office expenses.

   a. The mark-up on the cost of labor, materials, and equipment described in above Paragraphs 5.b. and 5.c. above shall compensate the contractor or Subcontractor for all indirect costs associated with or relating to the change in the Work including but not limited to, gross receipt tax, superintendent, reproduction, administration, and insurance.

C. Support each claim for additional costs, and for work done on a time-and-material basis, with documentation as required for a lump-sum bid, plus additional information:

1. Name of the Owner's authorized agent who ordered the work, and date of the order. Include copies of written authorization when applicable.

2. Dates and times that work was performed, and by whom, verified and signed by Owner's Authorized Representative.

3. Time record, summary of hours worked, and hourly rates paid.

4. Receipts and invoices for:

   a. Equipment used, listing dates and times of use.
   b. Products used, including listing of quantities.
   c. Subcontracts.

C. Document requests for substitutions of Products as specified in Instructions to Bidders Section 16.

19.3 PREPARATION OF CHANGE ORDERS:

A. Owner will prepare each Change Order. Two copies shall be prepared, each with original signature.

B. Form: Change Order - AIA Document G701.

C. Change Order will describe changes in the work, both additions, deletions and any voided proposed modifications.

D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

D. Upon completion of work under a Change Order, enters the pertinent changes in Record Documents.

19.4 CHANGE ORDER CONTENTS:

A. Contents of Change Orders will be based on, either:

1. Owner's proposed Modification and Contractor's responsive Bid as mutually agreed between Owner and Contractor.

2. Contractor's Bid for a change as mutually agreed between Owner and Contractor.

B. Owner will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

E. Contractor will sign and date the Change Order to indicate agreement with the terms therein.

20. CHANGES IN WORK:

20.1 MINOR CHANGES:

A. Owner's Right to Make Changes. The Owner reserves the right to make such additions, deletions, or changes to the Work as may be necessary in its sole and absolute discretion to complete the Work; provided, however, that no such additions, deletions or changes shall materially affect the substance hereof or materially change the Contract Sum. This Contract shall in no way be invalidated by any such additions, deletions or changes. No claim shall be made by the Contractor for loss of anticipated profits resulting from any such addition, deletion, or change to the Work.

B. Construction Conditions. Construction conditions may require minor changes in the location and installation of the Work and equipment to be furnished and other Work to be performed hereunder. The Contractor, when ordered by the Architect, shall make such adjustments and changes in the locations and Work as may be necessary without additional cost to the Owner, provided such adjustments and changes do not materially alter the character and quantity of the Work as a whole, or the Contract Sum, and provided further that Drawings and Specifications showing such adjustments and changes are given to the Contractor by the Owner or Architect within a reasonable time before work involving such adjustment and changes is begun. The Owner and the Architect shall be the sole judges of what constitutes a minor change for which no additional compensation shall be allowed.

C. Time Extension for Minor Changes. The Contractor shall be entitled to an extension of time for such minor changes only for the number of days which the Architect may determine to be necessary to complete such changes and only to the extent that such changes actually delay the completion of the Project, and then only if the Contractor shall have strictly complied with all the requirements of the Contract Documents.

20.2 EXTRA WORK:

A. The Owner may, in its sole discretion, at any time by a Proposed Modification or Change Order and without notice to the Sureties require the performance of such Extra Work as it deems necessary or desirable.

B. A Work Order or a Change Order covering Extra Work shall be valid only if issued in writing and signed by the Owner and the Contractor, and the Extra Work so ordered must be performed by the Contractor and reflects the amount of compensation to be paid to the Contractor

C. The amount of compensation to be paid to the Contractor for any Extra Work so ordered shall be determined as follows:

1. By such applicable unit prices as set forth in the Contract; or

2. If no such unit prices are set forth, then by a lump sum or other prices mutually agreed upon by the Owner and the Contractor.

21. CORRECTION OF WORK:

A. The Contractor shall promptly correct any work, which fails to conform to the requirements of the Contract Documents (the "Rejected Work"), whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs associated with the correction of any Rejected Work.

B. The Contractor's obligation to correct defective or non-complying work shall continue for a period of two (2) years after the date of Substantial Completion. The time period of this obligation may be extended by terms of warranties or other circumstances where required by law.

22. RIGHT TO SUPPLEMENT CONTRACTOR'S WORK FORCE:

In the event that the Contractor fails (in the opinion of the Owner) within 3 days following Notice from the Owner: (a) to correct defective Work; or (b) to supply labor, materials, or equipment that is necessary to complete the Work in strict accordance with the requirements of the Contract Documents, then the Owner shall have the right to (i) order the Contractor to stop the Work or a designated portion thereof; and/or (ii) supplement the Contractor's forces, in each case to the extent deemed necessary and advisable by the Owner and until such time as, in the opinion of the Owner, the cause of the order or action shall have been corrected. The Owner shall have the right to: (a) correct the deficiencies set forth in the Notice, either with its own forces or with a separate contractor engaged by the Owner to perform such corrections; (b) deduct the cost of correcting such deficiencies (including costs for additional services in connection therewith) from amounts then or thereafter due the Contractor under the Contract Documents; and (c) order the Contractor to re-start at a designated time all or any portion of the Work stopped by the Owner. If the amounts then or thereafter due the Contractor are insufficient to cover the cost of correcting the deficiencies, then the difference shall be payable by the Contractor to the Owner upon written demand. The Architect's determination of cost hereunder shall be final and binding upon the parties. The Owner's exercise of the right to correct deficiencies shall be in addition to, and shall in no way prejudice or limit, any other remedies available to the Owner. In the event that it is determined for any reason that grounds for stopping all or any portion of the Work did not exist, then, at the election of the Owner, the rights and obligations of the parties hereunder shall be the same as if the Notice directing the Contractor to stop the Work had been delivered under the provisions of Paragraph 23 hereof; provided, however, that the Contractor in such event shall be deemed to have received seven days prior written Notice of termination. Any compensation determined to be due the Contractor pursuant to Paragraph 23 shall be offset by the cost of correcting the Work. The Contractor shall in no event be entitled to receive anticipated profits or consequential damages of any kind in connection with any termination or action hereunder.

23. DISPUTED WORK:

If the Contractor is of the opinion that any work required by the Owner violates the terms and provisions of this Contract, then it shall, within four (4) days of commencing such work or action, notify the Owner of the asserted violation in writing. The Owner's Division Superintendent or Designee will make a determination within ten (10) days of the written request. Failure of the Contractor to so notify the Owner shall constitute a waiver and release of the Contractor's right to claim compensation for any work or damages resulting from such compliance.

24. CONTRACTOR CLAIMS:

A. The Contractor must, within five (5) days after the occurrence of the event giving rise to a claim, deliver to the Owner's Division Superintendent or Designee a written statement specifying that the Contractor has sustained such damage, and detailing the basis of the claim against the Owner with a breakdown of the nature and amounts of such damages, duly verified by the Contractor and notarized. This itemized breakdown shall be made to the fullest extent possible, otherwise the claim shall be deemed to be waived.

B. The Owner's Division Superintendent or Designee shall make a determination within twenty-five (25) days after receipt of the itemized breakdown, which decision shall be the final determination of the Owner.

C. No claim by the Contractor shall be made for loss of anticipated profits due to delay or extension of contract completion time. The Contractor shall be entitled to an extension of time for such minor changes only for the number of days which the Owner determines to be necessary to complete such changes and only to the extent the changes actually delay the completion of the project, and then only if the Contractor shall have strictly complied with all the requirements of the Contract Documents.

25. OWNER'S RIGHT TO TERMINATE FOR CONVENIENCE

The Owner shall have the right to terminate this Contract at its own convenience for any reason by giving seven (7) days prior written notice of termination to the Contractor. The Contractor shall be paid an amount equal to the lesser of: (1) the actual cost of any work, labor or materials actually performed or in place and the actual cost of any labor, equipment or materials ordered in good faith which could not be canceled, less the salvage value thereof, plus ten percent (10%) or (2) the pro rata percentage of completion based upon the Bid Breakdown plus the actual cost of any labor, equipment or materials ordered in good faith which could not be canceled, less the salvage value thereof.

26. CONTRACTOR'S DEFAULT AND TERMINATION:

A. The parties agree that:

1. if the Contractor is not prosecuting the Work with reasonable speed and diligence or is delaying the progress of the Work unreasonably or unnecessarily; or

2. If the Contractor fails to begin the Work when required to do so; or

3. if the force of workers or the quality or quantity of material furnished is not sufficient to insure completion of the Work within the specified time in the Contract Documents; or

4. if the Contractor fails in any manner of substance to observe the provisions of this Contract; or

5. if any of the Work, machinery, or equipment is defective and is not replaced; or

6. if the Contractor fails to make prompt payments to suppliers or to Subcontractors for Work performed in connection with the Contract; or

7. if the Contractor fails to cooperate in good faith with the Owner;

than the Owner, without prejudice to any other rights or remedies it may have hereunder, shall have the right to declare the Contractor in default, in whole or in part.

B. In the event the Owner elects to declare the Contractor in default, the Owner shall notify the Contractor and his Sureties by written notice describing the nature of the default and providing the Contractor a right to cure such default within three (3) calendar days after the date of the notice, or within such longer period as the Owner, in its sole and absolute discretion, may prescribe. In the event the default is not cured within the time period specified by the Owner, the Owner shall have the right to take any actions necessary to contract or complete the Work.

C. Any costs incurred in connection with completing or correcting the Work shall be deducted from the amounts then or thereafter due the Contractor. In the event such amounts are not sufficient to cover the costs incurred in connection with

completing or correcting the Work, the Contractor and his Surety shall pay to the Owner the amount of any deficiency.

D. If, after issuance of a Notice of termination of the Contract under the provisions of this Paragraph, it is determined for any reason that the Contractor was not in default under the provisions of Paragraph 24(A)(1) through 24(A)(7), or that cause for such termination otherwise did not exist under the provisions of Paragraph 24(A)(1) through 24(A)(7), then the rights and obligations of the parties shall be the same as if the Notice of termination had been delivered under the provisions of Paragraph 23 hereof; provided, however, that the Contractor in such event shall be deemed to have received seven (7) days prior written Notice of termination. Any compensation thereupon owing to the Contractor under Paragraph 23 shall be offset by the cost of remedying any defective Work performed by or on behalf the Contractor. In no event shall the Contractor be entitled to recover anticipated profits or consequential damages of any kind in connection with any termination of these Contract Documents.

27. SUBSTANTIAL COMPLETION:

A. When the Contractor considers that the Work is substantially complete, the Contractor shall provide the Owner written notification of such fact. The Owner shall prepare a comprehensive punch list of items to be completed and/or corrected. The Contractor shall proceed promptly to complete and correct the items on the punch list. Failure to include an item on the punch list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

D. It is the Contractor's responsibility to examine the work of all trades, to correct any deficiencies found, and to verify that all equipment is operating prior to notifying the Owner of Substantial Completion.

E. "Substantially complete" means that all work described in the specifications or shown on the drawings is done, with only minor items needed to fully complete the work. Typical work that should be done in order to be considered substantially complete include: all equipment installed, piped, electrically connected, and tested with any problems corrected; control systems completed, calibrated and functioning as intended, insulation installed. Equipment should be fully functional and ready for use.

28. FINAL INSPECTION:

Upon written notification by the Contractor that the Work is finally complete, and upon the Contractor's submission of a final application for payment, the Owner will conduct a final inspection of the Work. When the Owner determines that the Work has been satisfactorily completed and the Contract Documents fully performed, including the submission of Operation and Maintenance Data as required in Section 34, he shall promptly prepare and issue a Final Certificate for Payment.

29. PAYMENTS AND COMPLETION:

For the Contractor's complete performance of the Work, the Owner agrees to pay, and the Contractor agrees to accept, subject to the terms and conditions hereof, the Contract Sum, taking into consideration any deductions based on award of a combination of alternates, if applicable, plus the amount required to be paid for Extra Work less credit for any Work omitted.

30. SCHEDULE OF VALUES:

A. At the start of the Contract the Contractor shall provide a schedule of values for the work for the Owner's approval. The form shall be completed in detail including quantities and unit costs.

B. Submit three (3) copies to the project engineer for approval within 5 days of receipt of the Notice to Proceed.

C. The schedule of values shall be completed in detail including quantities and unit costs. Identify Schedule with:

1. Complete title of Project and Location
2. Contract number
3. Name and address of Contractor
4. Date of Submission
5. Labor per item to install (lump sum labor will not be acceptable)
6. Total Contract Sum

D. Organize the Content of Schedule into columns with headings as follows:

1. Item Number (Column No. 1)
2. Description of Item (Column No. 2)
3. Quantity (Column No. 3)
4. Unit of Measure (Column No. 4)
5. Cost per unit (Column No. 5)
6. Total cost of Item (Column No. 6)

E. Each item shall include a directly proportional amount of the Contractors overhead and profit.

31. REQUESTS FOR PAYMENTS AND PARTIAL PAYMENTS:

A. On or about the first of each month, the Contractor shall make and certify an estimate of the amount and fair value of the Work performed based on the schedule of values and may apply for partial payment. Invoice must have the FCPS contract number clearly indicated on it. The Contractor shall submit the request for payment on AIA Document G702 or equal detailing the schedule of values, work completed, retainage, etc.

B. The Owner will retain five percent (5%) of the amount of each estimate until final completion and acceptance of all work covered by this Contract, and (10%) of all equipment delivered and properly stored on the site.

C. Send all invoices to:

Fairfax County Public Schools
Department of Facilities and Transportation Services
Office of Facilities Management
Sideburn Support Center
5025 Sideburn Road
Fairfax, VA 22032-2637
Attention: Project Manager

32. CONTRACTUAL DISPUTES:

A. Any dispute arising hereunder or in connection herewith which is not otherwise resolved by the parties shall be decided by the Owner's Division Superintendent or Designee who shall reduce his decision to writing and mail or otherwise forward a copy thereof to the Contractor within thirty (30) days. The decision of the Owner's Division Superintendent or Designee shall be final and conclusive unless the Contractor appeals within six (6) months of the date of the final written decision by instituting legal action as provided in the Code of Virginia. A Contractor may not institute legal action, prior to receipt of the public body's decision on the claim, unless the public body fails to render such decision within the time specified.

B. Contractual claims, whether for money or other relief, shall be submitted in writing no later than sixty (60) days after final payment; however, written notice of the Contractor's intention to file such claim shall have been given at the time of the occurrence or beginning of the work upon which the claim is based. Nothing herein shall preclude a contract from requiring submission of an invoice for final payment within a certain time after completion and acceptance of the work or acceptance of the goods. Pendency of claims shall not delay payment of amounts agreed due in the final payment.

33. LEGAL ACTION:

No bidder, offeror, potential bidder or offeror, or Contractor shall institute any legal action until all statutory requirements have been met.

34. OPERATION AND MAINTENANCE DATA:

The Contractor shall compile data and related information appropriate for the Owner's record, maintenance and operation of products, equipment, materials and systems furnished under the Contract. This shall include as-built drawings.

A. Provide two (2) complete copies of the Record and Information Booklet and one (1) copy of Record and Information in a CD format and delivered to the Owner. Booklet shall be a commercial quality three-ring binder with durable and cleanable plastic cover.

B. The Contractor must include the Final Approved Equipment Submittal in the Booklet. The Contractor must provide a Warranty Letter indicating the warranty expiration date and a balancing report (if project is Mechanical/HVAC related) must be included in the Booklet.

C. Neatly typewritten table of contents for each volume, arranged in a systematic order by specification divisions. Indicate contractor, name of project, contract number and address of project on the face of the binder. On the end of the binder the school name shall be printed with a permanent readable label.

D. As-built drawings shall be red lined to show location and routing of any items not installed as shown on the original drawings.

35. BUILDING PERMITS:

Necessary building permits will be obtained by the Owner. Trade permits shall be obtained by the Contractor for all work prior to start of the project.

36. RIGHT OF AUDIT:

The Owner and its authorized representatives shall, until the expiration of three years from the date of final payment under these Contract Documents, have the right to examine and copy those books, records, accounts, documents, papers and other supporting data which involve transactions related to this Contract or which otherwise permit adequate evaluation of the cost or pricing data submitted, along with the computations and projections used therein (the "Records"), and the Contractor hereby covenants to maintain the Records in good order for such time and to deliver promptly the Records to the Owner within 5 days after its written request. In the event that the Contractor fails to comply with this Paragraph, then the Owner, in addition to any other available remedies, shall have the right to withhold payment of amounts otherwise due the Contractor until such time as the Contractor shall have complied fully with the obligations set forth herein.

37. NOTICES:

All notices required or permitted hereunder shall be in writing and delivered in the manner prescribed herein. Written notice shall be deemed to have been duly served on the Contractor if delivered by U.S. Mail, hand delivery, or facsimile transmission to the Contractor's office at any Project or to the business address or fax number of the Contractor as stated in its Bid Form; or if delivered in person to the Contractor, to the Contractor's foreman or superintendent for the Project, or any officer or director of the Contractor. Unless otherwise specified herein, Notice shall be deemed to have been duly served on the Owner if delivered by U.S. Mail, hand delivery, or facsimile transmission (with a duplicate copy transmitted by another means of delivery authorized hereunder) to the Office of Facilities Management, Fairfax County Public Schools, 5025 Sideburn Road, Fairfax, Virginia 22032, fax number (703) 239-0462.

38. ORDER OF PRECEDENCE:

The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work, including without limitation, all labor, materials, equipment and furnishings required in connectiontherewith. The Contract Documents are complimentary, and what is required by one shall be as binding as if required by all. In the event or any conflict, error or ambiguity in or among the various Contract Documents, such documents shall be accorded the following order of precedence:

A. Change Orders;

B. Notice to Proceed;

C. Notice of Award;

D. Special Provision;

E. General Conditions;

F. Agreement;

G. Addenda;

H. Drawings and Specifications;

I. Payment and Performance Bonds; and

J. The Bidding Documents, which shall include the Contractor's completed Bid Form and the Instructions to Bidders

END OF SECTION

GENERAL REQUIREMENTS

1. CONFLICT OF PROVISIONS:

Any provision of the Conditions of the Contract or of any other document incorporated herein by reference, which is in conflict or inconsistent with "Instructions to Bidders," except such provisions as are required by applicable codes, laws or regulations, shall be void to the extent of such conflict or inconsistency.

2. SITE CONDITIONS:

The Contractor is expected to have become familiar with, and taken into consideration, site conditions which may affect the work and to have checked all dimensions at the site.

A. No plea of ignorance of conditions that exist or may hereafter exist on the work site, or difficulties that may be encountered in execution of the work as a result of failure to make necessary investigations and examinations, will be accepted as an excuse for any failure or omission on the part of the Contractor to fulfill in every detail all the requirements of the Contract documents and to complete the work for the consideration set forth therein, or as a basis for any claim whatsoever.

3. GENERAL:

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

A. With submission of bid, the Contractor shall give written notice to the Owner of any materials or apparatus believed inadequate or unsuitable, in violation of Federal, State and Local Laws, Codes, Ordinances, and any necessary items of the work omitted. In the absence of such written notice, it is mutually agreed the Contractor has included the cost of all required items in his bid and that he will be responsible for the approved satisfactory functioning of the entire system without extra compensation.

B. All Contractors and subcontractors shall have current Virginia and Fairfax County licenses to do this kind of work.

C. A copy of these plans and specifications shall be kept at the job site for the duration of the project. If the Contractor requires additional copies of the plans and specifications it will be the Contractors responsibility to request up to two (2) additional copies from the Owner at no cost to the Contractor. If additional copies are requested these will be supplied to the Contractor at a cost of $50 per set by the Owner. Owner will NOT perform any inspections, punch lists, or progress payments unless a copy of plans and specifications are on the job site.

D. Successful bidder shall meet the Owner's Representative at the site or at the Owner's Representative's Office for a pre-construction meeting. After receipt of the Notice to Proceed the Contractor will contact the Owner's Representative to arrange the date, time and location of the meeting.

E. It is the intention of the specifications and drawings to call for finished work, tested and ready for operation. Whenever the word "provide" is used, it shall mean "provide and

install complete and ready for use."

F. Any apparatus, appliance, material or work not indicated in the drawings but mentioned in the specifications, or vice versa or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be furnished, delivered and installed by the Contractor without additional expense to the Owner.

G. Contractor shall install all equipment, materials in accordance with the Manufacturer's instructions, the drawings and these specifications.

H. Contractor shall include in the work, without additional cost to the Owner, any labor, materials, services, apparatus, drawings (in addition to the Contract Documents), required to comply with all applicable laws, ordinances, rules and regulations, whether or not shown or specified.

I. For security purposes, all personnel working at this building shall check in and check out at the building's office each day and wear any identification badges required by the building. **Contractor employees/representatives are required to have photo identification and be able to present upon request.** Contractor shall further supply all personnel with a form of identification as to company, name of employee and photographic likeness.

J. All work shall comply with current County, City, State and/or Federal codes and standards, whichever may apply.

K. The Contractor shall obtain Owner's approval for any revisions items specified prior to incorporation into the work.

L. Contractor shall inform all employees that Fairfax County has a NO SMOKING policy on school grounds. Therefore workers shall comply with this policy when students/school personnel are present.

4. SCAFFOLDING, RIGGING AND HOISTING:

A. Contractor shall furnish all scaffolding, rigging, hoisting, shoring and services necessary for erection and delivery into the premises, for equipment and apparatus furnished and removal of same from premises when no longer required.

B. No crane work will be done during regular school hours. The work area around cranes shall be protected with barricades, warning signs, and the Contractor shall provide personnel as necessary to prevent access to the work area by children or adults.

C. At no time the units shall be placed on the roof and rolled across the roof. Units shall be lifted directly onto the existing structural support on the roof.

5. ASBESTOS INSULATION:

A. The Owner will provide upon request copies of asbestos inspections/reports if necessary in the performance of this Contract.

B. If the Contractor encounters any suspected asbestos he shall immediately stop work and inform the Owner of the conditions.

C. The Owner will be responsible for testing and if necessary removal of any asbestos

containing material encountered in the performance of this Contract.

D. No materials or equipment containing asbestos shall be utilized in the construction of the project.

6. SITE PROTECTION:

A. While work is in progress, new materials and work area appurtenances shall be covered or protected from dust, debris or damage.

B. The Contractor shall maintain the job site in a clean, safe, orderly working condition and shall leave the premises completely clean each day.

C. The Contractor shall be responsible for the repair or replacement of any roof, grass, asphalt pavement, building, or building contents damaged during the course of this Contract. In addition, any fencing removed by the Contractor shall be re-installed without any damage and to the satisfaction of the Owner.

D. The Contractor shall provide all necessary manpower, barricades, safety signs and protection needed to safely perform the required work during the Contract.

E. All openings in building components required for installation of piping or wiring shall be cut, patched and repaired.

F. All items (lights, pipes, fencing, etc.) that have to be removed during the course of this work shall be reinstalled or relocated as necessary to complete the project.

G. Contractor shall protect all contents and infrastructure located within the work space and adjacent to the work areas. These shall include but not limited to bleachers, floor plates, lighting, sports padding, walls and ceiling. Gymnasium shall be left clean and free of all dust and debris.

H. Smoke dust and any construction odors shall not be allowed to enter the occupied building. Contractor shall provide exhaust fans, ducts, seal openings into the school, and if necessary, schedule work during off-hours to prevent problems during the times that students and teachers are in the building.

7. WARRANTY:

Contractor shall warrant the workmanship and materials against defects for a period of two (2) years from the date of final acceptance after all tests and inspections are complete. Manufacturer's warranty individual equipment shall be for two (2) years.

A. Any portion of the work supplied or performed by the Contractor, which fails within the warranty period shall be repaired or replaced by the Contractor without additional cost to the Owner. Repairs will be initiated within 24 hours of receiving a call from the Owner during the warranty period.

B. One (1) month prior to the expiration of the warranty, Contractor shall revisit the project with the Owner's representative to determine if any items require correction or if any items previously reported have not been corrected. If necessary, Contractor shall correct noted items even if correction work extends beyond the warranty expiration date.

8. INSTRUCTION OF OWNER'S REPRESENTATIVE:

A. The Contractor shall furnish, without additional expense to the Owner, full instruction in the care, adjustment, and operation of all parts and controls to the Owner's employees.

B. The instruction shall be given at a mutually agreed upon time with the Owner during the regular workweek after the equipment has been accepted and turned over to the Owner for regular operation. Where significant changes or modifications in equipment are made under the terms of guarantee, additional information shall be provided as may be necessary to acquaint the operating personnel with the changes or modifications.

9. OWNER'S REPRESENTATIVE:

The Director of the Office of Facilities Management, 5025 Sideburn Road, Fairfax, Virginia 22032, has designated **Chris Hutzell** as the point of contact (571) 294-8932. The Director, Office of Facilities Management, may designate such other individual(s) as he deems necessary to assist in the administration of this Contract. These individuals shall have the authority to inspect the Contractor's performance.

10. RELEASE OF BONDS:

The Surety Corporation providing the bonds for this project shall obtain a written release from the Owner prior to the expiration date of the bonds.

11. LOCKOUT AND TAGOUT:

The Contractor shall have an established lockout/tagout procedure, which meets the requirements of VOSH Standard 29 CFR Part 1910, Subpart J, Subsection 147, entitled Control of Hazardous Energy Sources. The Contractor shall coordinate with the Owner's Representative to conform to the Owner's lockout/tagout program requirements.

12. BARRICADES, WARNING SIGNS AND LIGHTS:

Comply with recognized standards and code requirements for the erection of substantial, structurally adequate barricades where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform personnel at the site and the public of the hazard being protected against. Provide lighting where appropriate and needed, including flashing yellow lights where appropriate.

13. CONFINED SPACES:

The Contractor shall have an established confined space procedure that meets the requirements of VOSH Standard 29 CFR 1910, Subpart J, §146, titled "Permit-Required Confined Spaces." The Contractor is responsible to provide confined space air monitoring and rescue equipment, as well as any other required devices or equipment on site to all employees. The Contractor must be able to provide safety training records of its employees performing work in a confined space to the Owner upon request. The Contractor shall coordinate with the Owner's representative to ensure the Contractor conforms to all confined space program requirement.

END OF SECTION

SECTION 01010(C)

SUMMARY OF WORK (RENOVATIONS)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: Drawings and general provisions of contract including General Conditions and other Division One through Division Sixteen Specifications Sections, apply to this section, with special attention to the following:

A. Applicable Standards: Section 01091

C. Temporary Utilities: Section 01510

D. Construction Aids: Section 01520

E. Barriers: Section 01530

F. Temporary Controls: Section 01560

G. Cleaning: Section 01710

H. Selective Demolition: Section 02070

1.02 SCOPE OF WORK COVERED BY CONTRACT DOCUMENTS

A. The project will involve providing demolition and new work construction documents for the replacement of the standby emergency generator.

B. The work shall be completed in phases as indicated on the Construction Phasing Drawings, in order to allow the Owner partial and continuing occupancy of the existing building during construction.

C. Normal operations shall be maintained during the course of the school year. The FCPS School year calendar is attached for Contractor's reference (*Insert a copy of the calendar here or at the end of Section*).

D. To protect students and staff health and enhance the learning environment of school children, the new school building has been designed with CHPS (Collaborative for High Performance Schools) criteria in mind and must achieve the CHPS Designed status. The Contractor must be familiar with VA-CHPS criteria and responsibilities that accompany a CHPS project.

1.03 CONTRACT METHOD

A. Construction of the Work under a single lump sum contract.

1.04 CONTRACTOR USE OF PREMISES

A. Limit use of premises for Work and for construction operations.

1.05 CONTRACTOR'S DUTIES

A. Except as specifically noted, provide and pay for:

1. Labor, materials, and equipment.

2. Tools, construction equipment, and machinery.

3. Water, heat, and utilities including electrical power required for construction.

4. Other facilities and services necessary for proper execution and completion of work.

B. Temporary Power and Lighting: Provide in accordance with Section 01510

C. Pay legally required sales, consumer and use taxes.

D. The Owner shall obtain and pay for the General Building Permit. The Contractor shall obtain and pay for all other permits required by law for the execution of this Work.

E. The Contractor shall also obtain and pay for certificates, inspections including but not limited to Fire Marshal's review and inspection fees and other legal fees required, both permanent and temporary, including plumbing, mechanical, sprinkler, electrical and highway permits. NOTE: Sewer frontage or availability and water frontage and tap-on fees or charges will be paid by Owner.

1.06 COORDINATION

A. Perform survey of existing site and building prior to commencing demolition work or other work affecting existing facilities.

B. Coordinate performance of work with school principal and staff in order to minimize disruption of normal activities during school hours. Operations requiring access to the existing facility that would cause such disruption will be scheduled for evening hours, summer recess or school holidays. See phasing, paragraph 2.02.

C. Coordinate the work for the various sections of Specifications to ensure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.

D. Verify that the characteristics of elements of interrelated operating equipment are compatible; coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Coordinate space requirements and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. In finished areas conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

1.07 FIELD ENGINEERING

A. Provide field engineering service; establish grades, lines, and levels, by use of recognized engineering survey practices.

B. Control datum for survey is that established by Owner-provided survey. Locate and protect control and reference points.

1.08 REFERENCE STANDARDS

A. For Products specified by association or trade standards, comply with requirements of the standards, except when more rigid requirements are specified or required by applicable codes.

B. The date of the standard is that which was in effect as of the Bid date, unless a specific date is indicated.

C. Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work. Refer to Section 01091, Applicable Standards.

PART 2 - SCHEDULE OF COMPLETION

2.01 CONSTRUCTION TIME

A. The Work shall be substantially complete and certified by the Architect on or before _____ The work shall be finally complete on or before _____.

B. Liquidated Damages:

1. Total Project: Should the Work not be performed on or before the times stated, there will be deducted from the Contract Balance the sum of _____ _____ ($_____) per consecutive calendar days, as Liquidated Damages, but not as a

penalty, for each day's delay after expiration of such period, and until final completion of the Work and its acceptance by the Owner.

2. Work phases: Should the Work of each phase not be performed on or before the completion dates established by the Work Sequence, there will be deducted from the contract balance the following sums for each phase, per consecutive calendar days, as Liquidated Damages, but not as a penalty, for each days delay after expiration of the completion dates, and until acceptance by the Owner:

3. Submittals required under section 01340: Should submittals not be received by the architect within the time periods indicated in Section 01340, there will be deducted from the contract balance the sum of one hundred dollars ($100.00) per consecutive calendar days, per submittal, as liquidated damages, but not as a penalty, for each day beyond the allowable time periods.

(List Phase or Phases and Dollar amount of Liquidated Damages per day.)

2.02 WORK SEQUENCE

A. Construct work in accordance with Project Schedule established under Section 01310; coordinate the schedule and operations with the Owner's Representative. There shall be no shutdown of electricity, water, sanitary/storm sewers, or heat during the life of the project unless approved in writing by the Owner. The Contractor is responsible for providing temporary air conditioning or heating for those areas which are scheduled to be occupied for school use and the Contractor has demolished the existing air conditioning or heating system. Maintain minimum corridor temperature at 68°F during heating season.

Portion of Work	Date of Commencement of Work	Date of Substantial Completion

B. Commencement of each phase of work in existing classrooms shall not occur until sufficient materials and equipment are available for the particular phase, and sufficient numbers of workmen are available to execute the work in the time period indicated.

C. Work Shifts: Where required by construction schedule and in order to ensure completion of work phases during the time periods indicated, the contractor shall operate two (2) separate, full time, work shifts per day, employing trades, skills and specialties including, but not limited to, the following:

1. General labor

2. Cleaning staff

3. Special systems technicians

4. Electrical

5. Plumbing

6. The contractor may modify this list to include other trades, skills and specialties as necessary to comply with the construction phasing schedule.

D. Where night shifts are in operation, the Contractor shall be allowed four (4) ten-hour night shifts per week, Monday through Thursday, during the school year. Friday nights and Saturday nights shall be available for school use during the school year.

PART 3 - USE OF PREMISES

3.01 CONTRACTOR'S USE OF PREMISES

A. Contractor shall coordinate use of premises under direction of Owner's Representative.

1. The Contractor shall maintain a drug free workplace for all his employees and subcontractors. The possession and/or use of drugs and alcohol are strictly forbidden on school property, and shall constitute grounds for immediate removal from the project site (Refer to Section 00700, General Conditions, 5.02C and 5.16).

2. Smoking, use of improper language and fraternization by contractor's employees with students and staff are prohibited and shall constitute grounds for immediate removal from the project site (Refer to Section 00700, General Conditions, 5.02C).

B. Contractor shall assume full responsibility for protection and safekeeping of Products under this Contract stored on the site.

C. Contractor shall move any stored Products, under Contractor's control, which interfere with operations of the Owner.

D. Contractor shall, at his option, obtain and pay for the use of additional storage or work areas needed for operations.

E. Contractor shall limit his use of the existing building for work and for storage to allow for:

1. Owner Occupancy

2. Public Use

F. Contractor shall provide temporary toilet facilities for use by his employees and other workers associated with the project. Contractor shall provide and maintain enough toilets to comply with OSHA and ANSI standards: 20 or less workers require 1 toilet, 20 or more require 1 toilet and 1 urinal per 40 workers, 200 or more require 1 toilet and 1 urinal per 50 workers. Toilets that are not maintained in a usable, sanitary condition shall not be considered "provided" or "available". The use of existing facilities is not permitted. Temporary toilets shall be located out of sight of the school building entrances and windows and away from staff and student travel paths. When site conditions do not allow for such placement, contractor shall provide and maintain a temporary privacy screen or other visual obstruction to prevent exposure of construction workers to staff or students. Privacy screen or other visual obstruction shall not impede the temporary toilet service vehicles from cleaning and maintenance operations, and shall not cause other inherent safety issues (e.g., uncapped rebar used as posts). Location of temporary toilets should be such that water runoff from cleaning operations do not contaminate student and staff travel paths. Final location to be approved by Owner.

G. In order to work overtime, a minimum of five (5) workers, excluding foreman and superintendent, must be available and willing to work. No overtime shall be allowed if this minimum crew size cannot be guaranteed.

3.02 WORK IN, OR ADJACENT TO, EXISTING OR OCCUPIED AREAS

A. Integrity of Existing Facility

1. Conduct operations to maintain the existing building in a secure, weather tight condition.

2. Repair damage to existing structures, equipment and furnishings resulting from the Contractor's operations within the building and on the site.

3. Where corridor ceilings have been removed and sprinkler mains have been installed to serve renovated space or new additions, sprinkler heads shall be temporarily installed and activated in the upright position and shall remain in the upright position until the ceiling concealment inspection has occurred, and the finished ceilings in those corridors can be completed.

B. Safety and Integrity of Occupied Areas

1. Where corridors shall be maintained for occupant use, no construction materials shall be stored or stockpiled. No Construction materials shall

be stored in a manner that restricts means of egress which are required be remain open for use by building occupants.

a. A minimum clear corridor width of 72" shall be maintained in all active corridors.

2. All existing emergency exit lights and fire alarms shall remain operational in occupied areas.

3. Means of egress for occupied areas shall be maintained with hard surfaced, non-slip walkways, ramps or other platforms. Use temporary handrails, barricades or canopies in accordance with Construction Phasing Plan requirements and requirements of Section 01520.

4. No work such as welding, soldering, or cutting, which is considered hazardous to the building occupants, shall take place in occupied areas during school operating hours.

5. Contractor shall take all necessary safety precautions to clearly delineate the construction areas with temporary barricades, dust partitions, and temporary construction fences as appropriate (See Section 01520, Construction Aids and Section 01530, Barriers.

6. Temporary partitions shall be dustproof partitions extending from floor to underside of deck. Doors through these partitions shall be lockable and self-closing.

7. Use temporary fencing to isolate on-site staging areas, storage yards and construction access ways. All temporary storage areas and construction trailers shall be enclosed with 6' high construction fences. Refer to 2.03, Temporary Enclosures, Section 01520.

8. No pneumatic, gas powered or other noise producing equipment, or other equipment powered by flammable fuels shall be allowed in occupied or renovation areas before or during normal school hours. Use of this equipment shall be permitted after normal school hours and weekends only. Comply with OSHA 1926.850.

a. Temporary heat shall be supplied by electric heaters only.

9. No hoisting shall be allowed over the school building during normal school hours or other times when the building is occupied for school related activities or other events.

10. Fire extinguishers are required in all construction areas. Comply with OSHA 1923.150.

11. Do not perform any work, including demolition, during normal school hours (or during times when school related activities or other events are being conducted) that could cause the fire alarm to be inadvertently activated. Do not perform any work during these times that could negatively impact operational sprinkler systems.

12. Roofing tanker trucks shall not be placed near windows and/or fresh air intakes of occupied areas. No roofing shall take place above occupied areas.

13. Where VAT (vinyl asbestos tile) and/or other asbestos containing materials (ACM) require removal prior to installation of new VCT flooring or where other work disturbs ACM, such removal shall be done under separate contract by Fairfax County Public Schools, except as noted in Section 02070 (See Section 02070, Selective Demolition).

14. All painting performed by spray application shall be done only when the building is unoccupied.

15. Do not locate masonry saws near any window or door opening or near a fresh air intake. Locate saws in fenced construction areas only.

16. Use of school supplies or school equipment by the Contractor is prohibited.

17. Where existing windows and/or doors are removed, and new replacement windows and/or doors are not available, the Contractor shall provide secure plywood coverings over the openings. No wall openings of any kind, no matter how small, shall be left uncovered after completion of a work shift.

18. No loud construction activities shall be allowed during school hours. Workers shall not operate radios, CD players, or "boom boxes" in the school building.

C. Scheduling and Operations

1. Schedule deliveries to avoid conflicts with morning student arrivals and afternoon student departures. Coordinate with the school to determine actual starting and ending times and approximate time periods for arrival and departure. No deliveries shall be allowed during these periods.

2. No work shall be allowed in corridors in occupied areas during school operating hours. Work such as cutting, demolition and patching, use of ladders and scaffolding, and presence of construction materials in these corridors between the hours of 6:00 AM and at least 30 minutes after scheduled release of students shall not be allowed.

3. Elementary Schools: No work shall be allowed in a corridor in an occupied area which is adjacent to, and provides access to, SACC (School-Aged Child Care) Rooms between the hours of 7:15 AM and 6:15 PM.

4. For each work phase, the Contractor shall remove and temporarily store all loose equipment, furniture and boxes within the rooms being renovated in an approved, designated location on the site. The school will be responsible for boxing and tagging all items prior to removal and storage. At the completion of the work phase, the Contractor shall move the stored items to their final location as directed by the Owner's Field Representative.

5. Do not start demolition of occupied space until the materials required for renovation are on the project site. The list of materials includes: floor finishes and base, millwork (pencil sharpener blocks, map rack blocking, etc), paint, doors and hardware, windows and venetian blinds, ceilings, power and lighting, HVAC equipment and controls, clocks, sound system, fire alarm system, security system, intercommunications system, telecommunications system, and sprinkler system.

6. Do not install doors unless all hardware and vision panel glass for the doors is on the project site.

D. Cleaning

1. Dust and mop corridors every morning before teachers arrive. Dust and mop any areas made dirty by construction operations on a daily basis.

2. Contractor shall immediately remove construction equipment and debris and clean any work zone located in an occupied area, once the work is completed or halted for a significant period of time.

3. Contractor shall provide consistent and frequent (daily) vacuuming to minimize and control dust levels in work areas (See Section 01710, Cleaning).

E. Systems Maintenance

1. Where the sequence of work requires work to be continuously performed in existing corridor ceiling spaces in occupied areas, tie all light fixtures at each corner of fixture to existing joists above, tie all smoke detection devices as close to structure as possible, and secure all security, intercommunications, telecommunications, and other active wiring which is not housed in conduit.

2. Do not remove existing wiring such as CATV, intercommunications, telecommunications, etc until the new wiring is in place and operational.

3. Prior to installation, Contractor shall obtain approval from Owner's Field Representative to run temporary wiring.

4. Inspect and change filters in HVAC equipment frequently during construction and prior to occupancy by Owner. Owner will not occupy any renovated area unless the entire HVAC system (including exhaust systems and automatic temperature controls) is operational.

5. All PRVs shall be fully operational at all times. Do not demolish any existing PRVs until replacement units are on site and new wiring is installed and ready for connection.

3.03 OWNER OCCUPANCY

A. The Contractor shall schedule his operations for completion of portions of the Work, for the Owner's occupancy upon Substantial Completion of the entire Work.

B. The Contractor agrees to permit the Owner to use and occupy a portion or unit of the project prior to formal acceptance of the total project by the Owner, provided the Owner:

1. Secures written consent of the Contractor (except in the event in the opinion of the Architect, the Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements, the Owner may occupy without Contractor's consent);

2. Secures endorsement from the insurance carrier and consent of the surety to permit occupancy of the building or use of the project during the remaining period of construction.

C. Owner will occupy the premises during the normal 10-month school year for the conduct of his normal operations. Cooperate with Owner's Representative in all construction operations to minimize conflict and to facilitate continued owner usage.

PART 4 - PRECAUTIONS AND SAFETY

4.01 SPECIAL REQUIREMENTS

A. Fire Protection: Provide and maintain an adequate number of hand fire extinguishers at convenient and appropriate locations during construction. Avoid all accumulations of flammable debris by removing rubbish promptly. Take all other precautions necessary to prevent fire. Supervise closely the storage of paint materials and other combustible products.

1. Existing fire alarm and detection system must remain operable at all times during construction.

B. Accident Prevention and Safety: Comply will all applicable laws, ordinances, rules, regulations and orders of governing authorities having jurisdiction for the safety of persons and property to protect them from damage, injury or loss. Erect and maintain, as required by conditions and progress of the work, all necessary safeguards for safety and protection, including fences, railings, barricades, lighting, posting of danger signs and other warnings against hazards. Where prevention of construction accidents is not regulated by code or ordinances, comply with AGC's "Manual of Accident Prevention in Construction." Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Project. All scaffolds shall be built in accordance with all requirements of local, state and Federal laws and regulations.

C. Crisis Preparedness – "Shelter in Place"

1. FCPS has developed a "Shelter in Place" procedure to protect students, teachers, administrative staff and construction workers in the event that a dangerous chemical or biological agent is released into the environment during occupied hours.

2. Upon notification by Public Safety Officials, all individuals on school grounds shall be directed to move indoors. All windows and doors shall be closed and locked. All heating, ventilating and air conditioning systems shall be shut down.

3. "Shelter in Place" emergencies are generally of short duration (several minutes to one or two hours). All individuals shall remain inside until Public Safety Officials have deemed that the area is safe.

4. It is the General Contractor's responsibility to familiarize his employees and subcontractors with the school's "Shelter in Place" plans and procedures. Note that once an emergency has been declared, no workers, subcontractors or suppliers who may be in transit to the job site shall be allowed into the area until the emergency is over.

D. ID Badges: The Owner shall supply identification badges which shall be worn by all tradesmen working on this project. No employees of the Contractor, subcontractors or sub-contractors, material suppliers or other persons associated with the project shall enter the existing school building or school property without an approved identification badge. Failure to comply with this requirement will be cause for immediate and permanent removal of the employee(s) in question from this and any other school building. Contractor shall maintain an identification badge log and record each badge number and to whom it was given and when.

1. Badge shall be a minimum 2" x 3 1/2".

2. Visible at all times.

3. Bright color (orange, lime green, etc.)

E. See paragraph 3.02, this Section, for additional specific precautions or restrictions related to safety.

END OF SECTION

SECTION 01040

SUPERVISION AND COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract including General Conditions and other Division 1 Specification Sections, apply to the work of this Section.

1.02 RELATED WORK

A. Section 01153: Change Order Procedures.

B. Section 01340: Shop Drawings, Product Data and Samples.

C. Section 01720: Project Record Information.

1.03 DESCRIPTION OF WORK

A. This contract will require the Contractor to utilize two shifts for part or all of the project. The Contractor shall employ and pay for the services of two full time, qualified Project Superintendents (one for each shift) for the duration of the construction work.

B. Qualifications of Project Manager and Project Superintendents:

1. Experienced in field work of the type required for this Project.

2. Submit name and address to Architect/Engineer.

1.04 PROJECT MANAGER'S RESPONSIBILITIES

A. Implement Change Order procedures in accordance with Section 01153.

B. Assist Project Superintendent(s) with schedules, material deliveries and subcontractor coordination and scheduling.

C. Participate in Progress Meetings

1.05 PROJECT SUPERINTENDENT RESPONSIBILITIES

A. Coordinate the work of the Contractor and the Subcontractors for the work of all trades.

B. Coordinate the schedules of the Contractor, the Subcontractors and materials and equipment suppliers.

C. Verify timely deliveries of products for installation by the trades.

D. Verify that labor and materials are adequate to maintain schedules.

E. Conduct conferences and maintain communications with Subcontractors, suppliers, and other concerned parties as necessary to:

1. Maintain coordination and schedules.

2. Resolve matters in dispute.

F. Participate in Project Meetings.

G. Report progress of work. Submit daily report to Owner's Representative listing number and type of work force and work in progress.

H. Recommend needed changes in Schedules.

I. Assist in compiling and assembling Project Record Information.

J. Observe required testing. Maintain a record of tests including:

1. Testing agency and name of inspector.

2. Subcontractor.

3. Manufacturer's representative present.

4. Date and time of testing.

5. Type of product or equipment.

6. Type of test, and results.

7. Retesting required.

K. Verify that Subcontractors maintain accurate record documents.

L. Attend all punch list inspections.

1.06 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. Prior to submittal, review for compliance with Contract Documents. Contractor shall stamp submittals approving them for materials, fit and coordination, prior to submission to Architect.

B. Check field dimensions and clearance dimensions.

C. Check relation to available space.

D. Check anchor bolt settings.

E. Review the effect of any changes on the work of other contracts or trades.

F. Check compatibility with equipment and work of other trades.

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provision of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section.

1.02 DESCRIPTION

A. Contractor shall be responsible for all cutting, fitting, and patching, including attendant excavation and backfill, required to complete the work and to:

1. Make its several parts fit together properly.

2. Uncover portions of the Work to provide for installation of ill-timed work.

3. Remove and replace defective work.

4. Remove and replace work not conforming to requirements of Contract Documents.

5. Remove samples of installed work as specified for testing.

6. Provide routine penetration of non-structural surfaces for installation of piping and electrical conduit.

B. Related Requirements in other parts of the project manual:

1. Basic responsibilities of other parties: General Conditions Section 00700.

1.03 RELATED WORK

1. Summary of Work: Section 01010.

2. Construction Aids: Section 01520

3. Barriers: Section 01530

4. Selective Demolition: Section 02070

1.04 SUBMITTALS

A. Submit a written existing building survey to Architect and the Owner's Representative prior to any work being started.

B. Submit a written request to Architect and the Owner's Representative well in advance of executing any cutting or alteration which affects:

1. The work of the Owner or any separate contractor.

2. The structural value or integrity of any element of the Project.

3. The integrity or effectiveness of weather-exposed or moisture resistant elements or systems.

4. The efficient, operational life, maintenance or safety of operational elements.

5. The visual qualities of the sight-exposed elements.

C. Submit a written notice to Architect and the Owner's Representative designating the date and the time the work will be uncovered.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Comply with specifications and standards for each specific product involved.

PART 3 - EXECUTION

3.01 INSPECTION

A. General Contractor shall conduct an existing building survey with the Owners representative prior to any construction operations. A written report shall be made of existing project conditions, including elements subject to damage or to movement during cutting of patching.

B. After uncovering work inspect the conditions affecting installation of products, or performance of the work.

C. Report unsatisfactory or questionable conditions to the Architect and the Owner's Representative in writing; do not proceed with the work until the Architect and the Owner's Representative have provided further instructions.

D. Verify that areas to be demolished are unoccupied and discontinued in use.

E. Verify that all utilities within the area to be demolished have been cut off and capped.

F. Do not commence work until conditions are acceptable to Architect and Owner's Representative.

3.02 PREPARATION

A. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the work.

B. Provide devices and methods as necessary to protect other portions of the Project from damage.

C. Provide protection from the elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water.

D. Remove items scheduled to be salvaged for Owner, and place in designated storage area.

3.03 PERFORMANCE

A. Execute cutting and demolition by methods that will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.

B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.

C. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.

D. Restore work that has been cut or removed; install new products to provide completed work in accordance with requirements of Contract Documents.

E. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through walls, floors, roofs and other surfaces.

F. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:

1. For continuous surfaces, refinish to nearest intersection.

2. For an assembly, refinish the entire unit.

G. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools during school hours.

H. Do not use power-driven impact tools in or near occupied areas during school hours (see Section 01010, Summary of Work).

END OF SECTION

SECTION 01091

APPLICABLE STANDARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 through Division 16 Specification Sections, apply to this Section.

1.02 RELATED WORK

A. Specific naming of codes or standards occurs in other sections of these specifications.

1.03 DESCRIPTION

A. Throughout the Contract Documents, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics.

B. Where materials or workmanship are specified in the Contract Documents to meet or exceed the specifically named code or standard, it is the Contractor's responsibility to provide materials and workmanship which meet or exceed the specifically named code or standard.

1. It is the Contractor's responsibility, when so required by the Contract Documents or by written request from the Architect, to provide all required proof that the materials or workmanship, or both, meet or exceed the requirements of the specifically named code or standard. Such proof shall be in the form requested in writing by the Architect, and generally will be required to be copies of a certified report of tests conducted by a testing agency approved for that purpose by the Architect.

C. The most current adopted edition of the individual standards or test procedures, published by the associations establishing applicable standards, and referenced throughout the Contract Documents, shall apply. Exception: The edition of the VUSBC governing the Contract Documents shall be that edition which was in force for purposes of permit review and issuance by Fairfax County Department of Public Works and Environmental Services (DPWES).

1.04 QUALITY ASSURANCE

A. Familiarity with pertinent codes and standards: In procuring all items used in this Work, it is the Contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this Work meet or exceed the specified requirements.

B. Rejection of non-complying items: The Architect reserves the right to reject items incorporated into the Work which fail to meet the specified minimum requirements. The Architect further reserves the right, and without prejudice to other recourse the Architect may take, to accept non-complying items subject to an adjustment in the Contract Amount as approved by the Architect and the Owner.

1.05 APPLICABLE INDUSTRY AND CODE REFERENCE STANDARDS

A. Applicable standards listed in the Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:

1. AAMA - American Architectural Manufacturers Association, 1827 Walden Office Square, Suite 550, Schaumburg, IL 60173-4268. 1-847-303-5664.

2. AASHTO - American Association of State Highway and Transportation Officials, 444 N. Capitol St., N.W., Suite 249, Washington, D.C. 20001. 1-202-624-5800.

3. ACI - American Concrete Institute, 38800 Country Club Drive, Farmington Hills, MI 48333-9094. 1-248-848-3700.

4. AGA - American Gas Association, 400 N. Capitol Street., N.W., Washington, D. C. 20001. 1-800-841-8430.

5. AISC - American Institute of Steel Construction, Inc., One East Wacker Drive, Suite 3100, Chicago, IL 60601-2001. 1-312—670-2400.

6. ICC/ANSI A117.1-2003 - American National Standards Institute, Inc. 25 West 43rd Street, Fourth Floor, New York, NY 10036. 1-212-642-4900.

7. ASTM - American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. 1-610-832-9585.

8. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE), 1791 Tullie Cir., N.E., Atlanta, GA 30329. 1-800-5-ASHRAE.

9. AWI - Architectural Woodwork Institute, 1952 Isaac Newton Square W., Reston, VA 20190. 1-703-733-0600.

10. AWS - American Welding Society, Inc., 550 N.W., Lejuene Road, Miami, FL 33126. 1-800-433-9353.

11. BIA - Brick Industry Association, 11490 Commerce Park Drive, #300, Reston, VA 22091-1525. 1-703-620-0010.

12. BHMA – Builder's Hardware Manufacturers Association, 355 Lexington Ave., 17th Floor, New York, NY 10017. 1-212-297-2122.

13. CRI – Carpet and Rug Institute, 310 Holiday Ave., P.O. Box 2048, Dalton, GA 30722. 1-800-882-8846.

14. CRSI - Concrete Reinforcing Steel Institute, 933 North Plum Grove Road, Schaumburg, IL 60173-4758. 1-847-517-1200.

15. CS - Commercial Standard of NIST, U.S. Department of Commerce, Government Printing Office, Washington, D.C. 20402.

16. DHI – Door and Hardware Institute, 14150, Newbrook Dr., Suite 200, Chantilly, VA 20151-2223. 1-703-222-2410.

17. Glass Association of North America, 2945 S.W. Wanamaker Dr., Suite A, Topeka, KS 66614. 1-785-271-0208.

18. International Building Code, International Code Council, Inc., in cooperation with Building Officials and Code Administrators International, Inc., 4051 West Flossmoor Road, Country Club Hills, IL 60478-5795, 1-800-214-4321 (as incorporated into the Virginia USBC).

19. MFMA – Maple Flooring Manufacturers Association, 60 Revere Dr., Suite 500, Northbrook, IL 60062. 1-847-480-9138.

20. NAAMM - The National Association of Architectural Metal Manufacturers, 8 South Michigan Avenue, Suite 100, Chicago, IL 60603. 1-312-332-0405.

21. NCMA - National Concrete Masonry Association, 2302 Horse Pen Road, P.O. Box 781, Herndon, VA 20171-3499. 1-703-713-1900.

22. NEC - National Electrical Code (See NFPA).

23. NEMA - National Electrical Manufacturers Association, 660 White Plains Rd., Suite 600, Tarrytown, NY 10591. 1-914-524-8650.

24. NFPA - National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269. 1-800-344-3555.

25. NIST - National Institute of Standards and Technology, Office of Standards Service, 100 Bureau Dr., Gaithersburg, MD 20899. 1-301-975-2758.

26. NRCA - National Roofing Contractors Association, 10255 West Higgins Road, Suite 600, Rosemont, IL 60018-5607. 1-847-299-9070.

27. NSF - National Sanitation Foundation, 3475 Plymouth Road, Ann Arbor, MI 48105.

28. NTMA – National Terrazzo and Mosaic Association, 110 E. Market St., Suite 200A, Leesburg, VA 20176. 1-800-323-9736.

29. OSHA - Occupational Safety and Health Administration, US Dept. of Labor/OSHA, 200 Constitution Avenue, N.W., Washington, D.C. 20210. 1-202-693-1999.

30. PCA - Portland Cement Association, 5420 Old Orchard Road, Skokie, IL 60077-1083. 1-847-966-6200.

31. SMACNA - Sheet Metal and Air-Conditioning Contractors Association International, 4201 Lafayette Center Dr., Chantilly, VA 20151. 1-703-803-2980.

32. SDI - Steel Deck Institute, P.O. Box 25, Fox River Grove, IL 60021-0025. 1-847-458-4647.

33. SDI - Steel Door Institute, 30200 Detroit Road, Cleveland, OH 44145-1967. 1-440-899-0010.

34. SJI - Steel Joist Institute, 3127 10th Avenue, North, Myrtle Beach, South Carolina 29577-6760. 1-843-626-1995.

35. SSPC - Steel Structures Painting Council, 40 24th Street, 6th Floor, Pittsburgh, Pennsylvania 15222-4656. 1-412-281-2331.

36. TCA - Tile Council of America, Inc., 100 Clemson Research Boulevard, Anderson, SC 29625. 1-864-646-TILE.

37. UL - Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, Illinois 60062-2096. 1-877-854-3577.

38. VDOT - Virginia Department of Transportation, P.O. Box 256, 2400 Pine Forest Drive, Colonial Heights, Virginia 23834.

39. Federal Specs and Federal Standards - General Services Administration, Specification Section, Room 6654, 7th & D Streets S.W., Washington, D.C. 20407.

40. VUSBC - Virginia Uniform Statewide Building Code.

41. 2010 ADA Standards for Accessible Design. Department of Justice 800-514-0301

42. Fairfax County Special Inspections Program: Special Inspections: Implementation in Fairfax County – Current Edition (SIFC- Current Edition), as administered by the Fairfax County Critical Structures Section, Department of Public Works and Environmental Services.

43. Fairfax County "Public Facilities Manual" (PFM).

44. Commonwealth of Virginia, "Erosion and Sediment Control Handbook."

45. VA CHPS-Virginia Collaborative for High Performance Schools, 2443 Fair Oaks Blvd. #259, Sacramento, CA 95825.

1.06 JOB SITE ACCESS

A. The Contractor shall provide one (1) copy of all reference standards at the job site for review by the Architect and Owner's Representative.

END OF SECTION

SECTION 01152

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and Division 1 Specification Sections, apply to the Work of this Section.

1.02 DESCRIPTION

A. Submit Applications for Payment to Architect in accordance with the schedule established by Conditions of the Contract and Agreement Between Owner and Contractor.

1.03 RELATED WORK

A. Lump Sum Price: Agreement Between Owner and Contractor.

B. Progress Payments, Retainages, and Final Payment. General Conditions, Section 00700.

C. Construction Progress Schedules: Section 01310.

D. Schedule of Values: Section 01370.

E. Contract Close-out: Section 01700.

1.04 FORMS

A. Application for each progress payment shall be prepared using the standard Fairfax County Public Schools Forms (copy enclosed), which include the following:

1. Requisition Form

2. Stored Material Log

3. Change Order Log

4. Certification Form

1.05 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Fill in required information, complete list of all component items of Work, fill in columns for all line items included in the Schedule of Values. Round all values off to the nearest dollar.

B. Requisition Form: Describe each line item and list scheduled value, previous completed value, value of work for the current application, total value to date, and balance of uncompleted work. Calculate percentage of completion. Provide a total for all line items for each column.

C. Stored Material Log: Describe all stored materials, listing previous value, received value for the application period, and installed value for the application period. List the total of these values (current value) for each item. Provide a total for all columns, less 10% retainage.

1. The Contractor may bill for materials stored off the site with the following provisions:

a. Provide a copy of manufacturers invoice indicating nature of materials and amount of invoice.

b. Indicate location of materials stored.

c. Materials shall be marked to indicate that they are the property of Fairfax County Public Schools, and to indicate their destination.

d. Provide proof of sufficient insurance coverage to cover the value of the materials stored. The policy or certificate of insurance shall be in the name of Fairfax County Public Schools and must be submitted prior to the submission of the requisition. The Owner reserves the right to inspect the materials stored off the site prior to processing the requisition.

D. Change Order Log: Identify and describe all Change Orders, Change Proposals and prepared Modification Requests. List total value, previous value, value for application period, total value to date, and balance of uncompleted work. Provide a total for all columns, less 5% retainage.

E. Complete all items in item 1, "Analysis of Work Performed" on the certification form.

F. Execute certification form with the signature of a duly authorized officer of the Contractor on all copies of the completed form.

G. Submit 5 copies of the application for payment.

1.06 PROGRESS PAYMENTS

A. The Owner will make a Progress Payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this Contract, but to insure the proper performance of this contract, the Owner will retain five percent (5%) of the value of change orders and ten percent (10%) of the portion of the Contract Sum properly allocable to materials and equipment suitably stored at or off the site until final completion and acceptance of all work included in the Contract.

1.07 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application Form as specified for progress payments.

B. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700: Contract Close-out.

1.08 SUBMITTAL PROCEDURE

A. Submit Applications for Payment on a monthly basis or as stipulated in the Owner Contractor agreement.

B. Submit for review and obtain certification signature of the School Board Inspector on all completed copies of the application. The Contractor shall provide supplementary information to facilitate review of application if requested.

C. Upon review and certification by the School Board Inspector, submit all copies to the Architect. Upon review and certification by the architect, all copies shall be forwarded to the School Board representative.

D. Upon review and certification by the School Board representative, the application shall be forwarded for payment.

E. Upon rejection by any certifying party, the Contractor shall make corrections or adjustments required by the rejection, and shall be required to obtain certification of the corrected application by all parties.

END OF SECTION

CONTRACTOR LETTERHEAD

FAIRFAX COUNTY PUBLIC SCHOOLS REQUISITION

PROJECT:
DATE:
REQUISITION #

1. *ANALYSIS OF WORK PERFORMED*

(A)	TOTAL COST OF WORK PERFORMED TO DATE		
(B)	LESS AMOUNT RETAINED	%	
(C)	NET AMOUNT EARNED ON CONTRACT TO DATE		
(D)	MATERIALS STORED (ATTACH SCHEDULE)		
(E)	ADD OR DEDUCT CHANGE ORDERS (ATTACH SCHEDULE)		
(F)	TOTAL AMOUNT EARNED ON CONTRACT TO DATE		
(G)	LESS PREVIOUS PAYMENTS		
(H)	BALANCE DUE THIS PAYMENT		

2. *CERTIFICATION OF CONTRACTOR*

ACCORDING TO THE BEST OF MY KNOWLEDGE AND BELIEF, I CERTIFY THAT ALL ITEMS AND AMOUNTS SHOWN ON THE FACE OF THIS REQUISITION FOR PAYMENT ARE CORRECT; THAT ALL WORK HAS BEEN PERFORMED AND/OR MATERIAL SUPPLIED IN FULL ACCORDANCE WITH THE REQUIREMENTS OF THE REFERENCED CONTRACT, AND/OR DULY AUTHORIZED DEVIATIONS, SUBSTITUTIONS, ALTERATIONS, AND/OR ADDITIONS; THAT THE FOREGOING IS A TRUE AND CORRECT STATEMENT OF THE CONTRACT ACCOUNT UP TO AND INCLUDING THE LAST DAY OF THE PERIOD COVERED BY THIS REQUISITION; THAT NO PART OF THE "BALANCE DUE THIS PAYMENT" HAS BEEN RECEIVED AND THAT I WILL MAKE TIMELY PAYMENT FROM THESE PROCEEDS TO MY SUBCONTRACTORS AND/OR SUPPLIERS IN ACCORDANCE WITH MY CONTRACTUAL ARRANGEMENTS WITH THEM.

BY _____ _____
CONTRACTOR — SIGNATURE OF AUTHORIZED REPRESENTATIVE

_____ 19 _____ TITLE _____

3. *CERTIFICATION OF SCHOOL BOARD INSPECTOR*

I CERTIFY THAT I HAVE CHECKED AND VERIFIED THE ABOVE AND FOREGOING REQUISITON FOR PAYMENT DURING MY REGULAR INSPECTION.

_____ _____
SCHOOL BOARD INSPECTOR — DATE

4. *CERTIFICATION OF ARCHITECT*

I CERTIFY THAT I HAVE CHECKED AND VERIFIED THE ABOVE AND FOREGOING REQUISITION FOR PAYMENT; THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IT IS A TRUE AND CORRECT STATEMENT OF WORK PERFORMED AND/OR MATERIAL SUPPLIED BY THE CONTRACTOR; THAT ALL WORK AND/OR MATERIAL INCLUDED IN THIS REQUISITION HAS BEEN INSPECTED BY ME AND/OR BY DULY AUTHORIZED REPRESENTATIVE OR ASSISTANTS AND THAT IT HAS BEEN PERFORMED AND/OR SUPPLIED IN FULL ACCORDANCE WITH REQUIREMENTS OF THE REFERENCED CONTRACT; AND THAT PAYMENT CLAIMED BY THE CONTRACTOR IS CORRECTLY COMPUTED ON THE BASIS OF WORK PERFORMED AND/OR MATERIAL SUPPLIED TO DATE.

SIGNED _____ _____
ARCHITECT — DATE

5. *PRE-PAYMENT CERTIFICATION BY FAIRFAX COUNTY SCHOOL BOARD*

I CERTIFY THAT I HAVE CHECKED AND VERIFIED THIS REQUISITION AND THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT IS A TRUE AND CORRECT STATEMENT OF WORK PERFORMED AND/OR MATERIAL SUPPLIED BY THE CONTRACTOR; THAT ALL WORK INCLUDED IN THIS ESTIMATE HAS BEEN INSPECTED AND THAT IT HAS BEEN PERFORMED AND OR SUPPLIED IN FULL ACCORDANCE WITH REQUIREMENTS OF THE CONTRACT.

FAIRFAX COUNTY SCHOOL BOARD

SIGNED _____ _____
DATE

FAIRFAX COUNTY PUBLIC SCHOOLS
REQUISITION FORM

PROJECT:
DATE:
REQUISITION #:

ITEM #	DESCRIPTION	SCHEDULED VALUE	PREVIOUS VALUE	VALUE THIS REPORT	TOTAL VALUE TO DATE	BALANCE TO COMPLETE	% COMPLETE
	TOTALS:						

FAIRFAX COUNTY PUBLIC SCHOOLS
REQUISITION FORM

STORED MATERIAL LOG

PROJECT:
DATE:
REQUISITION #:

ITEM #	DESCRIPTION	PREVIOUS VALUE	RECEIVED THIS MONTH	INSTALLED THIS MONTH	CURRENT VALUE
	Example	*A*	*B*	*C*	*A+B-C=*
	SUBTOTALS:				
	LESS 10% RET.				
	TOTAL:				

FAIRFAX COUNTY PUBLIC SCHOOLS
REQUISITION FORM

CHANGE ORDER LOG

PROJECT:
DATE:
REQUISITION #:

CO #	CP #	PM #	DESCRIPTION	CHANGE VALUE	PREVIOUS VALUE	VALUE THIS REPORT	TOTAL VALUE TO DATE	BALANCE TO COMPLETE
			SUBTOTALS:					
			LESS 5%:					
			TOTAL:					

SECTION 01153

CHANGE ORDER PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specifications Section, apply to this Section.

1.02 RELATED WORK

A. General Conditions of the Contract: Section 00700.

B. Section 01152: Applications for Payment.

C. Section 01370: Schedule of Values.

D. Section 01630: Substitutions

1.03 WORK DESCRIPTION

A. Promptly implement Change Order procedures:

1. Provide full written data required to evaluate changes.

2. Maintain detailed records for work done on a time-and-material/force account basis.

3. Provide full documentation to Architect/Engineer on request.

B. Contractor and Owner will designate in writing the person who is authorized to execute Change Orders.

1.04 DEFINITIONS

A. Change Order: See Section 00700, General Conditions.

B. Proposed Modification: See Section 00700, General Conditions.

1.05 PRELIMINARY PROCEDURES

A. Owner or Architect/Engineer may initiate changes by submitting Proposed Modification to Contractor. Request will include:

1. Detailed description of the Change, Products, and location of the change in the Project.

2. Supplementary or revised Drawings and Specifications.

3. A specific period of time during which the requested price will be considered valid, which shall be 90 calendar days, unless otherwise stated.

4. The specific action to be initiated by the Contractor.

5. The amounts of the unit prices to be:

   a. Those stated in the Agreement and the Proposal Form.

   b. Those mutually agreed upon between Owner and Contractor.

B. Contractor may initiate changes by submitting a written notice to Architect/Engineer, containing:

1. Description of the proposed changes.

2. Statement of the reason for making the changes.

3. Statement of the effect on the Contract Sum and the Contract Time.

4. Statement of the effect on the work.

5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

6. All claims by the Contractor arising out of or relating to the performance of the work or any termination hereunder shall be made in writing and shall be decided by the Director of the Office of Design and Construction or his designated representative. All claims must be filed with the Office of Design and Construction within five (5) calendar days after sustaining the injury underlying the claim. Failure to comply with this provision shall constitute an absolute waiver of such claim. The Director or the Office of Design and Construction or his designated representative shall issue his written decision within thirty (30) days of his receipt of the written claim which decision shall be final.

1.06 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each quotation for a lump-sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow Owner and Architect/Engineer to evaluate the quotation.

1. Proposal costs attributable to labor shall be based upon labor rates for each category of personnel. A list of labor rates shall be submitted to the Owner for review and concurrence within 30 calendar days of the Notice

to Proceed. See paragraph B2 below for allowable inclusions for establishment of labor rates.

B. Provide data for lump sum proposals in accordance with the following criteria:

1. The Contractor's proposal shall be itemized and segregated by labor, equipment, and materials for the various components of the Change in the Work (no aggregate labor total will be acceptable) and shall be accompanied by signed proposals of any Subcontractors who shall perform any portion of the Change in the Work and of any entities who shall furnish materials or equipment for incorporation therein.

2. The portion of the proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, shall include anticipated gross wages of Job Site labor, including foremen, who shall be directly involved in the Change in the Work (for such time as they will be so involved), plus payroll costs (including premium costs of overtime labor, if overtime is authorized, Social Security, Federal or State unemployment insurance taxes and fringe benefits required by collective bargaining agreements entered into by the Contractor or any such Subcontractor in connection with such labor).

3. The portion of the proposal relating to materials may include the reasonable anticipated direct costs to the Contractor or to any of its Subcontractors of materials shall be purchased for incorporation in the Change in the Work, plus transportation and applicable sales or use taxes.

4. The proposal may further include the Contractor's and any of his Subcontractor's reasonable anticipated equipment rental costs, except small hand tools, in connection with the Change in the Work. For rented equipment an hourly rental rate shall be used which shall be determined by using the monthly rental rates taken from the current edition of the Rental Rate Blue Book for construction Equipment and dividing it by 176. An allowance shall be made for operating costs for each and every hour the equipment is actually operating in accordance with the rates listed in the aforesaid Rental Book. The Contractor shall be allowed no more than 65% of the rental rate on Contractor owned equipment.

5. Base Cost is defined as the total of labor, material, and equipment rentals as described in Subparagraphs 1.06B3 and 1.06B4. The actual net cost in money to the Owner for the Change in the Work shall be computed as follows:

   a. Contractor overhead and profit: If the Contractor performs the Change in the Work, his compensation shall be the Base Costs as described above, plus a mark-up of 20% on Base Costs less than or equal to $10,000. If the Base Costs exceed $10,000, his

compensation shall be the Base Cost, plus a mark-up of 20% on Base Costs less than or equal to $10,000, and a mark-up of 15% on Base Costs above $10,000.

b. Subcontractor overhead and profit: If the work is performed by a Subcontractor, his compensation shall be the Base Costs as described above plus a mark-up as described in Paragraph 5.a. above for overhead and profit. The Contractor's compensation shall be a mark-up of ten percent (10%) of the Subcontractors Base Costs.

c. Sub-subcontractor overhead and profit: If the work is performed by a Sub-subcontractor, his compensation shall be the Base Costs as herein described plus a mark-up as described in paragraph 5.a. above for overhead and profit. The Subcontractors compensation shall be a mark-up of ten percent (10%) of the Sub-subcontractor's Base Costs for his overhead. The Contractor's compensation will be a mark-up of ten percent (10%) of the Sub-subcontractor Base Costs.

6. The mark-up on the cost of labor, materials, and equipment described in Paragraphs 5.a., 5.b., and 5.c. above shall compensate the Contractor, Subcontractor or Sub-subcontractor for all indirect costs associated with or relating to the Change in the Work including, but not limited to, labor and/or equipment inefficiency, acceleration, changes in sequence, delays, interference, impact on unchanged work, gross receipts tax, superintendent, small tools, reproduction, administration, insurance, unrelated safety requirements, temporary structures and offices, all other general and administrative, home office, and field office expenses.

a. The mark-up on the cost of labor, materials, and equipment described in Paragraphs 5.b. and 5.c. above shall compensate the contractor or Subcontractor for all indirect costs associated with or relating to the change in the Work including but not limited to, gross receipt tax, superintendent, reproduction, administration, and insurance.

C. Support each claim for additional costs, and for work done on a time-and-material basis, with documentation as required for a lump-sum proposal, plus additional information:

1. Name of the Owner's authorized agent who ordered the work, and date of the order. Include copies of written authorization when applicable.
2. Dates and times that work was performed, and by whom, verified and signed by Owner's Field Representative.

3. Time record, summary of hours worked, and hourly rates paid.

4. Receipts and invoices for:

   a. Equipment used, listing dates and times of use.
   b. Products used, including listing of quantities.
   c. Subcontracts.

D. Document requests for substitutions of Products as specified in Section 01600.

1.07 PREPARATION OF CHANGE ORDERS

A. Architect/Owner will prepare each Change Order. Three copies shall be prepared, each with original signature.

B. Form: Change Order - AIA Document G701.

C. Change Order will describe changes in the work, both additions, deletions and any voided proposed modifications.

D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

E. Upon completion of work under a Change Order, enter the pertinent changes in Record Documents.

1.08 CHANGE ORDER CONTENTS

A. Contents of Change Orders will be based on, either:

1. Architect/Engineer's proposed Modification and Contractor's responsive Proposal as mutually agreed between Owner and Contractor.

2. Contractor's Proposal for a change as recommended by Architect/Engineer and as mutually agreed between Owner and Contractor.

B. Owner and Architect/Engineer will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

C. Contractor will sign and date the Change Order to indicate agreement with the terms therein.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section.

1.02 RELATED WORK

A. Pre-Bid Conferences: Instructions to Bidders.

B. Summary of Work: Section 01010.

C. Construction Progress Schedules: Section 01310.

D. Shop Drawings, Product Data and Samples: Section 01340.

E. Project Record Information: Section 01720.

F. Operating and Maintenance Data: Section 01730.

1.03 DESCRIPTION OF WORK

A. Architect/Owner will schedule and administer pre-construction meetings, periodic progress meetings and specially called meetings throughout the progress of the Work. Architect/Owner will:

1. Preside at meetings.

2. Record the minutes, including all significant proceedings and decisions.

3. Reproduce and distribute copies of minutes after each meeting and furnish six (6) copies of minutes to Contractor.

B. Representatives of Contractor, Subcontractors and suppliers attending the meeting shall be qualified and authorized to act on behalf of the entity each represents.

C. Architect will attend meetings to ascertain that Work is being expedited consistent with Contract Documents and the construction schedules. Consulting Engineers will attend meetings when so directed by the Architect.

1.04 PRE-CONSTRUCTION MEETING

A. Schedule immediately after date of Notice to Proceed.

B. Location: A central site, convenient for all parties, as designated by the Owner.

C. Attendance:

1. Owner's Representative.
2. Architect/Engineers.
3. Contractor's Superintendent.
4. Major Subcontractors.
5. Major Suppliers.
6. Others as appropriate as determined by the Architect and Contractor.

D. Suggested Agenda (including, but not limited to the following):

1. Distribution and discussion of:
   a. List of major subcontractors and suppliers.
   b. Projected Construction Schedules.
2. Critical work sequencing:
   a. Major equipment deliveries and priorities.
3. Project Coordination.
   a. Designation of responsible personnel.
4. Procedures and processing of:
   a. Field decisions.
   b. Submittals.
   c. Change Orders.
   d. Applications for Payment.
5. Adequacy of distribution of Contract Documents.
6. Procedures for maintaining Record Information.

7. Use of premises:

   a. Office, work, and storage areas.

   b. Owner's requirements.

8. Construction facilities, controls and construction aids.

9. Temporary utilities.

10. Safety and first aid procedures.

11. Security procedures.

1.05 PROGRESS MEETINGS

A. Schedule progress meetings every second week unless it is determined by Architect and Owner that additional meetings are necessary.

B. Hold specially called meetings as required by progress of the work.

C. Location of the meetings: The Project field office of the Contractor.

D. Attendance:

1. Architect and his professional consultants as needed.

2. Subcontractors as appropriate. (Major and Active)

3. Suppliers as appropriate. (Major and Active)

4. Owner's Representatives

E. Agenda of each progress meeting.

1. Review and approval of minutes of previous meeting

2. Safety Concerns

3. School Coordination Issues

4. Submittals

5. Delivery Schedules

6. Utility Coordination

7. Field observations, problems, conflicts
8. Outstanding RFI's, PM's, CO's
9. Outstanding Punch Lists
10. Uncorrected Deficiencies
11. Status of DPWES, Fire Marshal, Health Inspections
12. Third Party Inspections and Certifications
13. Abatement Issues
14. Any other problems which might impact the schedule
15. Corrective measures and procedures to regain projected schedule
16. Two-week look-ahead
17. Maintenance of quality standards and controls
18. Site Cleanliness
19. Security Issues
20. Project Closeout related items
21. Other pertinent business

END OF SECTION

SECTION 01310

CONSTRUCTION PROGRESS SCHEDULES

1.1 GENERAL. This section specifies requirements and procedures in preparing computerized schedules and reports for planning, coordinating, executing, and monitoring the progress of the Work. Work shall be scheduled using the Critical Path Method (CPM) type of network analysis. Scheduling software shall be Primavera Project Planner (P3, or most recent version for Microsoft Windows) or Microsoft Project Pro 2003 (such software to be referred to herein as the "Specified Software").

The Contractor shall employ a trained and experienced construction scheduling person knowledgeable in construction work sequencing, productivity, scheduling, and application of the Specified Software system. This person shall work together with the Contractor's management team and with the Architect and the Owner to deliver acceptable products outlined in this section.

1.2 SCHEDULING RESPONSIBILITIES.

1.2.1. Critical Path Method. The Construction Schedule shall be developed by means of a critical path method of scheduling and shall be used to monitor job progress. The Contractor shall be responsible for providing all information concerning the sequencing, logic and duration of all activities as well as providing the initial critical path method ("CPM") logic network diagram (in electronic and paper form) and tabular report data. Once the initial logic network diagram is accepted by the Architect and the Owner, the Contractor shall be responsible for providing monthly update information on logic, percentage completion, actual start and finish dates, and duration changes as requested by the Owner.

1.2.2. Large-Scale Plots; Posting of Schedule and Schedule Updates. The Contractor shall provide a large scale plot of the initial schedule and of any subsequent updated schedules. The schedules shall be posted in the progress meeting trailer and in the FCPS Representative's trailer at the Project Site.

1.2.3. Schedule Accuracy. The initial Construction Schedule and all update information shall be provided by the Contractor. This information shall constitute a representation of the best efforts of the Contractor and his subcontractors with regard to the manner in which they intend to accomplish the Work within the Contract Period. Similarly, all progress information to be provided by and through the Contractor shall constitute an accurate representation of his or his subcontractor's or supplier's actual performance. The Construction Schedule shall at all times remain an accurate reflection of the Contractor's actual or projected sequencing of Work. Once accepted by the Owner, adherence to the established Construction Schedule shall be obligatory upon the Contractor and his subcontractors for performance of the Work. The Owner shall have the right to require the Contractor to revise the Construction Schedule if in his judgment the schedule does not accurately reflect the actual prosecution of the Work, or the Contractor is in violation of any provisions of this section. The Contractor shall revise the Construction Schedule to meet the above criteria as often as is

necessary during the performance of the Work without additional cost to the Owner.

1.3 SUBMITTALS.

1.3.1. Qualifications. The Contractor shall submit a statement of qualifications to perform computerized CPM scheduling. The submittal shall verify that either the Contractor has in-house capability qualified to use CPM technique and the Specified Software or that the Contractor has arranged for the services of a CPM consultant so qualified. In either event the statement shall identify the individual(s) who will perform the CPM scheduling. Capability shall be verified by description of construction projects on which the individual has successfully utilized computerized CPM scheduling and shall include at least two projects of similar nature, scope, and value, neither of which shall be less than one-half the Contract Sum for the Project. The statement shall also identify the contact persons for the referenced projects with current telephone and address information. Unless otherwise agreed in writing by the Owner, the Contractor shall assign the individual who will perform the scheduling to a full-time, onsite position.

1.3.2. 90-Day CPM Network Diagram. Within 14 days after issuance of the Notice to Proceed, the Contractor shall submit to the Architect six (6) prints of his proposed CPM network diagram (also in electronic form) and tabular reports for the first 90 days of the Work. This initial logic diagram shall be drawn as described herein and submitted on sheets 36 inches by 48 inches and shall include both procurement and construction activities. The schedule will be the subject of a schedule review meeting with the Contractor, the Architect, and the Owner within 14 days after its submission. The Contractor shall revise and resubmit the 90-day schedule until it is acceptable to the Owner.

1.3.3. Complete CPM Network Diagram. Within 60 days after issuance of the Notice to Proceed, the Contractor shall submit to the Architect six (6) sets of his proposed CPM logic diagram (also in electronic form) and tabular reports for the entire Contract duration and shall include both procurement and construction activities. The tabular reports shall include the following:

a. Report of activities sorted by activity number. Activity numbers, where practical, shall correlate to the area numbers designated on the drawings.

b. Report of activities sorted by early start date and late start date.

c. Report of activities sorted by total float, as such term is defined below.

d. Report of activities sorted by responsibility code. Responsibility codes shall be established for the Contractor, Architect, Owner, Subcontractors, Suppliers, etc. These codes shall be identified in the network diagram.

e. A successor-predecessor report which shall identify the successor and predecessor activities for each activity and ties between schedule activities.

f. Report of resource loading.

g. Report of cost loading.

h. Cash flow curves, cumulative and per month sorted by early start dates.

i. Activity codes, values, and coding dictionary.

The logic diagram shall be drawn as described herein and will be the subject of a schedule review meeting with the Contractor, the Architect, and the Owner within two weeks after its submission. If a review of the submitted CPM schedule indicates a work plan which will not result in completion of the Work within the Contract Period, it shall be the Contractor's responsibility to revise the CPM schedule as required by the Owner and resubmit it until it is acceptable.

The Contractor's failure to submit an acceptable CPM schedule may, without limitation and in the Owner's sole discretion, constitute cause for the withholding of any partial payment otherwise due under the Contract Documents. The accepted schedule will be designated the "original Construction Schedule".

Acceptance of the Contractor's proposed CPM schedule by the Owner will in no event constitute its representation that the Work can be completed as indicated on such schedule.

1.3.4. Submittal Schedule. In addition to the above scheduling requirements, the Contractor shall submit a complete separate and independent schedule and detailed listing of anticipated submittals during the Contract Period. The submittal schedule shall be submitted within 30 days after Notice to Proceed. The submittal schedule shall then be accepted or revised as required by the Owner within 10 working days after receipt, and the Contractor shall incorporate the dates and review durations into his complete CPM schedule.

The Contractor shall coordinate his submittals with those of his Subcontractors and suppliers. The anticipated submission due date for each submittal shall be indicated along with the date on which its return is required. For planning purposes, the Architect will return shop drawings within 10 working days after receipt. Whenever the review of a particular submittal is on the critical path, such submittal shall be clearly marked in red with the words 'Critical Path" by the Contractor at the time of submission.

The Submittal Schedule, including a detailed listing of submittals, shall be revised and resubmitted each month for use as a tracking log.

1.3.5. Look Ahead Reports. The Contractor shall also submit two-week look ahead reports.

1.4 NETWORK REQUIREMENTS.

1.4.1. Network Diagrams. The network diagram shall show the order and interdependence of activities and the sequence in which the Work is to be accomplished as planned by the Contractor. The purpose of the network analysis diagram is to show how the start of a given activity is dependent on the completion of preceding activities and how its completion restricts the start of succeeding activities. A time scaled precedence format shall be followed. The detailed network diagram shall be time scaled showing a continuous flow from left to right.

1.4.2. Schedule Activities Groupings. The schedule activities shall be organized into two major groups: procurement and construction.

Procurement activities shall include, but not be limited to, the following:

a. Major submittal items.

b. Review and acceptance of major submittal items.

c. Fabrication and delivery of major submittal items.

Fabrication and delivery of the major submittal items shall be tied logically to the correct construction activity in the overall Construction Schedule.

Construction activities shall be physical work activities that describe how the job will be constructed.

1.4.3. Breakdown of Activities and Coding Structure. The Contractor shall breakdown the Work into activities with durations of no greater than 15 working days each, except for nonconstruction activities such as procurement of materials, delivery of equipment, and other activities which may require longer durations. To the extent feasible, activities related to a specific physical area of the Project shall be grouped on the network for ease of understanding and simplification. The selection and number of activities and coding of activities shall be subject to the review and acceptance by the Architect and Owner.

The coding shall follow the designation conventions of the facilities outlined on the drawings and in the specifications and shall include identification of Subcontractors, suppliers/vendors and fabricators, and other parties reporting to the Contractor.

Each activity on the network shall have indicated for it the following:

a. A single duration, no longer than 15 working days which represents the single best estimate of the expected elapsed time considering the scope of work involved in the activity. Durations shall be expressed in days. Normal holidays and weather delays shall be included. One critical path shall be shown for the schedule.

b. A unique activity identification (I.D.) number shall be assigned to each activity. The I.D. number may contain up to 10 alpha-numeric characters.

c. A brief description of the activity shall be included. If this description is not definitive, a separate listing of each activity and a descriptive narrative may be required.

d. Each activity (except for procurement activities) shall be cost loaded as specified herein to indicate the total estimated costs of the activity. No activity shall exceed $50,000 except for an equipment item or other item approved by the Owner. Material costs shall be assigned to delivery activities.

e. Each activity shall be manhour loaded with the estimated manhours to be expended on each activity.

1.4.4. Incomplete Schedules. Notwithstanding the network review by the Architect and/or the Owner, the failure to include on a network any element of the Work required for the performance of this Contract shall not excuse the Contractor from completing all Work required within the Contract Period.

1.4.5. Early Finish Schedules. A CPM schedule which shows a completion of any milestone or completion dates prior to the contractual completion date for that milestone or completion date may be accepted, but in no event shall be acceptable as a basis for a claim for delay against the Owner and Architect and any of their authorized representatives if the early completion date is not met by the Contractor.

1.5 COST LOADING.

1.5.1. Schedule of Values. Each activity on the Construction Schedule shall be allocated a dollar value in accordance with the provisions of this section. Each activity's assigned cost shall consist of labor, equipment, and materials costs, and a *pro rata* contribution to overhead and profit. The aggregate amount of all activity costs shall equal the Contract Sum. In submitting cost data, the Contractor certifies that it is not unbalanced and that the value assigned to each activity represents the Contractor's estimate of the actual costs of performing that activity.

The accepted schedule of values shall be deemed to represent a fair, reasonable, and equitable dollar cost allocation for each activity on the Contractor's construction schedule.

1.5.2. Documentation. If, in the opinion of the Architect and the Owner, the cost data do not meet the requirements for a balanced bid breakdown, the Contractor shall present documentation to the Architect substantiating any cost allocation on the cost data. Cost allocations shall be considered unbalanced if any activity on the construction schedule has been assigned, in the opinion of the Owner, a disproportionate allocation of direct costs, overhead, or profit.

1.6 PROGRESS OF THE WORK.

1.6.1. Start of Work. The Work shall be started in accordance with Article 11 of the General Conditions and the Notice to Proceed. The Work shall be executed with such progress as may be required to prevent delay to separate contractors or to the completion of the Project as a whole. The Work shall be executed at such times and in or on such parts of the site and with such forces, material, and equipment, as to assure completion of the Work within the Contract Period.

1.6.2. Delays to Critical Path. Whenever it becomes apparent that delays to the critical path have occurred (other than an unreasonable delay caused by the Owner) and that, as a result, the Work will not be completed within the Contract Period, the Contractor, at the direction of the Owner, shall take one or more of the following actions at no additional cost to the Owner:

a. Increase construction and other manpower in such quantities and crafts as will substantially eliminate the backlog of Work.

b. Increase the number of working hours per shift, shifts per day, or working days per week; the amount of construction equipment; the forms for concrete work; etc., or any combination of the foregoing to substantially eliminate the backlog of Work.

c. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised schedule.

d. The Contractor shall submit to the Owner for review a written statement of the steps he intends to take to remove or arrest the delay to the schedule. The Contractor shall promptly provide such level of effort to bring the Work back on schedule. Should schedule delays persist, the Contractor's Surety may be asked to attend schedule update meetings.

e. Failure of the Contractor to comply with the requirements herein shall subject him, without limitation and at the Owner's sole discretion, to withholding, in whole or in part, of payments otherwise due the Contractor for Work performed under the Contract. Any withholding of monies is not a penalty for noncompliance, but is an assurance for the Owner that funds will be available to implement these requirements should the Contractor fail to do so, since failure of the Contractor to comply with these requirements shall mean that the Contractor failed to prosecute the

Work with such diligence as to ensure its completion within the Contract Period.

1.7 SCHEDULE DATES.

1.7.1. Changed Work. If the Contractor claims acceleration charges in a cost proposal, the Contractor shall document a sub-network in the schedule depicting the changed Work and its effect on other activities. This sub-network shall be tied to the main network with appropriate logic so that a true analysis of the critical path can be made in order to prove acceleration costs.

1.7.2. Extensions of Time. The Contract Period will be adjusted only for causes specified in the Contract Documents. In the event that the Contractor requests an extension of any Contract Period, he shall furnish such justification and supporting evidence as the Owner or Architect may deem necessary, and as provided for in the General Conditions for a determination as to whether the Contractor is entitled to an extension of time under the provisions of this Contract. The Owner will, after receipt of such justification and supporting evidence, make a determination in the manner specified in the General Conditions and will advise the Contractor in writing thereof. If the Owner finds that the Contractor is entitled to an extension of the Contract Period under the provisions of the Contract Documents, then the Owner's determination as to the total number of days of extension shall be based upon the current accepted and updated Construction Schedule and on all data relevant to the extension. Such data shall be included in an update of the Construction Schedule. The Contractor acknowledges and agrees that actual delays in activities which, according to the Construction Schedule do not affect any contract completion date shown by the critical path in the network, do not have any effect on the Contract completion dates, and therefore, will not entitle the Contractor to an extension of time or to any change in the Contract Period.

All information known to the Contractor at the time concerning the nature and extent of the delay shall be submitted in writing in accordance with the General Conditions. Within the time frame stated in the General Conditions but before the date of final payment under this Contract, all information as required above concerning the delay must be submitted to the Architect and to the Owner. No time extension will be granted for requests which are not submitted with the specified time limits.

1.7.3. Schedule Adjustment by Owner. From time to time it may be necessary for the Contract Schedule and completion time to be adjusted by the Owner to reflect the effects of job conditions, acts or omissions of other contractors not directly associated with the Contract, weather, technical difficulties, strikes, unavoidable delays on the part of the Owner or his representatives, and other unforeseeable conditions which may require schedule adjustments and/or extensions of the Contract Period. Under such conditions the Contractor shall reschedule the Work to reflect the changed conditions, and the Contractor shall revise his schedule accordingly. Time extensions affecting the Contract Period shall be

granted by the Owner in writing. No additional compensation shall be made to the Contractor for such schedule changes. The Owner has the right to accelerate performance of the Work. The Contractor will be entitled additional compensation in the event that the Owner requires completion of the Project prior to the expiration of the Contract Period; provided that such acceleration is not required as a result of the fault or neglect of the Contractor.

1.7.4. Schedule Meetings. The Contractor shall participate in such periodic scheduling meetings, and shall furnish such periodic schedule updates, as may be required by the Owner in order to meet the needs of the Project, as such are determined by the Owner.

1.8 FLOAT.

1.8.1. Definition of Float. As employed in the Contract Documents, the terms "float" and "float time" shall be used interchangeably to mean the period of time between the early start date and the late start date, or the early finish date and the late finish date of any activities set forth on the Construction Schedule.

1.8.2. Ownership of Float. The Owner shall have and retain exclusive ownership of the float.

1.8.3. Float Time. The Contractor shall not be entitled to any adjustment to the Contract Period, the Construction Schedule, or the Contract Sum, or to any additional payment of any sort by reason of the loss of use of any float time. The Owner may initiate changes to the Work that absorb float time without obligation to adjust or extend the overall completion date or any intermediate completion dates set forth in the CPM network. Owner-initiated changes that affect the critical path on the CPM network shall be the sole grounds for extending (or shortening) the Contract Period. Contractor-initiated changes that encroach on the float time identified in the CPM network may be accomplished with the Owner's prior approval. Such changes, however, shall give way to Owner-initiated changes competing for the same float time. Delays in the critical path that are not associated with proper requests for time extensions in accordance with Part 11 of the General Conditions shall be deemed to be the responsibility of the Contractor.

END OF SECTION

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General Conditions and other Division 1 through Division 16 Specifications apply to this Section, with special attention to the following:

1. Construction Progress Schedules: Section 01310.

2. Respective Sections of the Specifications requiring submittals: Consult Division 15 and 16 for any additional requirements.

3. The Fairfax County Special Inspections Manual/"Special Inspections: Implementation in Fairfax County" (Edition in force at time of project permit). Review and approval of fabrication and erection submittals as required by the Special Inspections Program.

4. Fairfax County Public Schools Agreement between Owner and Architect, Paragraph 1(D).5.j: The Architect shall make available to the Contractor compact disks containing the floor plan backgrounds, reflected ceiling plans and building sections. These electronic files shall be used for preparing submittals which require equipment locations and systems layouts.

1.02 DESCRIPTION OF WORK

A. Submit shop drawings, product data and samples required by Contract Documents.

1.03 SHOP SUBMITTALS

A. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

B. Sheet size minimum: 8 1/2" x 11"; maximum: 30" x 42". All sheets in one submittal shall be of uniform size.

C. Drawings: Submit a minimum of four (4) sets of prints; one (1) set of prints shall be returned to the Contractor for reproduction and distribution. Electronic PDF submissions are acceptable for review. Two (2) paper sets of approved prints shall be retained by the Owner. For submittals requiring special inspection review, provide additional sets as required by the special inspection manual.

D. For submittals other than drawings, such as written specifications, maintenance instructions, calculations and catalog data which are capable of xerographic

duplicating, provide a minimum of five (5) copies. One (1) copy shall be returned to the Contractor for duplication and distribution. Two (2) copies shall be retained by the Owner.

1.04 PRODUCT DATA:

A. Manufacturer's standard schematic drawings.

1. Delete information not applicable to project.

2. Provide additional information applicable to project.

B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data:

1. Mark each copy to identify pertinent materials, products or models.

2. Indicate dimensions and clearances required.

3. Indicate performance characteristics and capacities.

4. Indicate wiring diagrams and controls.

1.05 SAMPLES

A. Office samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of product or material with integrally related parts and attachments devices.

2. Full range of color samples.

B. Field samples and mock-ups.

1. Erect at project site at location acceptable to Architect.

2. Construct each sample or mock-up complete.

C. Provide a minimum of three (3) samples unless specified otherwise. Two (2) samples shall be retained by the Owner.

1.06 SUBMITTALS REQUIRING JURISDICTIONAL APPROVAL

A. Certain categories of submittals are required to be reviewed and approved by appropriate jurisdictional authority prior to incorporating into the Work. Make such submittals first to the Architect for review, then submit to the approving authority.

B. Structural Submittals; to each drawing affix the seal and signature of a Professional Engineer licensed in the State of Virginia, including, without limitation:

1. Foundation piles and caissons, reinforced concrete framing systems, structural steel components and framing, steel roof trusses and girders, open-web steel joists, steel deck systems, steel stair railing and guardrail systems, steel ladders, cold-formed metal framing.

1.07 SUBMITTALS FOR CHPS APPROVAL

1. Provide documentation from the manufacturer that the products meet or exceed the requirements of CHPS.

1.08 CONTRACTOR RESPONSIBILITIES

A. Review shop drawings, product data and samples prior to submission for conformance to contract requirements. Return non-conforming submittals to originator.

1. Contractor shall stamp each submittal with a stamp bearing the following information:

Approved for Construction
Approved as Noted
Submittal Deviates from Contract Requirements

Contractor
Date:_____
Review by:_____
Return by:_____
Spec. Section:_____
Submittal No.:_____

Indicate action taken of each submittal by checking appropriate box. If information on stamp is incomplete, submittal will be returned with no action taken.

B. Verify:

1. Floor Plan layouts provided by Architect on electronic media.

2. Field measurements

3. Field construction criteria

4. Catalog numbers and similar data.

C. Coordinate each submittal with requirements of work and of Contract Documents.

D. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's review of submittals.

E. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals, unless Architect gives written acceptance of specific deviations.

F. At time of submission, note deviations in submittals from requirements of Contract Documents.

G. Begin no work which requires submittals unless such submittals have been returned with Architect's stamp and initials or signatures indicating review.

H. Distribute copies of submittals to parties concerned.

1.09 SUBMISSION REQUIREMENTS

A. Schedule submissions for receipt by the architect from the date of Notice to Proceed (NTP) as follows:

1. Finish materials and packaged or prefabricated equipment: Maximum of 45 calendar days from NTP.

2. Designed systems (such as, but not limited to, casework, control systems, fire protection special systems window and curtain wall systems): Maximum of 90 calendar days from NTP.

3. Liquidated damages: Liquidated damages shall be assessed for each consecutive calendar day beyond the maximum time periods indicated above. Refer to Section 01010, summary of work.

B. Shop Drawings: Submit the required number of prints of each Drawing, including fabrication, erection, layout, and setting drawings until final acceptance is obtained.

C. Product Data: Submit copies of manufacturer's descriptive data for materials, equipment and fixtures, including catalog sheets, showing dimensions, performance characteristics and capacities; wiring diagrams and controls; schedules; and other pertinent information as required. Indicate compliance with applicable referenced quality standards.

D. Samples: Submit samples specified in product specification sections.

1. Provide full range for color, texture or pattern selection.

2. Samples shall be marked, tagged, or otherwise identified with name of Contractor, name of project, purpose for which samples are submitted, and date, and be accompanied by letter of transmittal containing similar information, together with specification paragraph number for identification of each item.

E. Submittals shall include:

1. Date and revision dates.

2. Project title and number _____.

3. The names of:

a. Architect
b. Contractor
c. Subcontractor
d. Supplier
e. Manufacturer
f. Separate detailer when pertinent.

4. Identification of product or material.

5. Relation to adjacent materials.

6. Field dimensions, clearly identified as such.

7. Specification section number.

8. Applicable standards, such as ASTM number or Federal Specification.

9. Space for Architect's stamp. (3" x 5" min.)

10. Identification of deviations from Contract Documents.

1.10 RESUBMISSION REQUIREMENTS

A. Shop Drawings

1. Revise drawings in accordance with review comments and resubmit as specified for initial submittal.

2. Indicate changes that have been made. Indicate resubmittal status by adding "R" after the original submittal number.

B. Project Data and Samples: Submit new data and samples as specified for initial submittal.

1.11 ARCHITECT'S DUTIES

A. Review for:

1. Design concept of project.

2. Information given in Contract Documents.

3. Review consultants' shop drawings for coordination with Contract Documents.

B. Review of separate item does not constitute review of an assembly in which item functions.

C. Affix stamp and initials or signature certifying to review of submittal.

D. Return submittals to Contractor for reproduction and distribution.

END OF SECTION

SECTION 01370

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section, with special attention to the following:

1. Application for Payment: Section 01152

1.02 DESCRIPTION OF WORK

A. Submit to the Architect a Schedule of Values allocated to the various portions for the Work within ten days after award of Contract.

B. Upon request of the Architect, support the values with data substantiating their correctness.

C. The Schedule of Values, unless objected to by the Architect, shall be used only as the basis for the Contractor's Applications for Payment.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

A. The form for the Schedule of Values shall be the Fairfax County School Board's "Schedule of Amounts for Contract Payments" and will be obtained from the School Board's Office of Design and Construction. The form shall be completed in detail including quantities and unit costs.

B. Identify Schedule with:

1. Complete title of Project and location.

2. Name of Architect and Architect's Commission Number.

3. Name and address of Contractor.

4. Date of Submission.

C. Organize the Content of Schedule into columns with headings as follows:

1. Item No. (Column No. 1).
2. Description of Item (Column No. 2).

3. Quantity (Column No. 3).

4. Unit of Measure (Column No. 4).

5. Cost per unit (Column No. 5).

6. Total cost of Item (Column No. 6).

D. Column numbers above are identical to Requisition for Payment column numbers.

E. Information in Schedule of Values shall be incorporated into proper and identical lines and columns of all Requisitions for Payment, and shall serve as a basis for computing Progress Payments during construction.

F. All line items shall be separated into all sub-values of major products and all information for all sub-values shall be as outlined above.

G. Each item shall include a directly proportional amount of the Contractor's overhead and profit.

H. The sum of all values listed in the Schedule shall equal the total Contract Sum.

1.04 SUBMITTALS

A. Submit six (6) copies for review by the Architect and Owner immediately after the Notice to Proceed. The Architect and Owner shall review and approve, or require modifications of the submittal. If modifications are required, make corrections and resubmit.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section.

1.02 RELATED WORK

A. Additional Requirements of all parties to the Contract: General Conditions, Section 00700.

B. Summary of Work: Section 01010.

C. Supervision and Coordination: Section 01040.

D. Construction Progress Schedules: Section 01310.

E. Shop Drawings, Product Data and Samples: Section 01340.

F Materials and Equipment: Section 01600.

1.03 REFERENCE STANDARD

A. ASTM E329-77 (1983) Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as used in construction.

1.04 QUALITY CONTROL

A. The Owner, with the cooperation of the Contractor, shall maintain an adequate inspection system and perform such inspections and tests as will assure that the work performed under the Contract conforms to the Contract Documents and shall maintain and make available to the Architect adequate records of such inspections and tests.

1.05 DEFINITIONS

A. Factory Tests: Tests made on various products and component parts prior to shipment to the job site, including but not limited to such items as transformer, boilers, air conditioning equipment, electrical equipment, and precast concrete.

B. Field Tests: Tests or analysis made at, or in the vicinity of the job site in connection with the actual construction.

C. Product: A type or category of manufactured goods, constructions and installations, or their associated services.

D. Testing Laboratory: An individual or firm whose function includes testing, analyzing or inspecting "products."

E. Certified Test Reports: Reports are reports of tests signed by a qualified professional attesting that tests were performed in accordance with the test method specified, that the test results reported are accurate, and that items tested either meet or fail to meet the stated minimum requirements. These test reports include those performed by Factory Mutual, Underwriters Laboratories, Inc., and others.

F. Certified Inspection Reports: Those signed by approved inspectors attesting at the items inspected meet the specification requirements other than any exception included in the report.

G. Manufacturer's Certificate of Conformance or Compliance: A certificate signed by an authorized manufacturer's official attesting that the material or equipment delivered meets the specifications requirements.

1.06 SUBMITTALS

A. Submittals shall be prepared in accordance with the General Requirements and submitted to the Owner for approval. Each submittal shall be accompanied with a cover letter signed by the Lab. Each item proposed to be incorporated into the Contract shall be clearly marked and identified in the submittals, and shall be cross-referenced to the Contract Drawings and Specifications so as to identify clearly the use for which it is intended.

B. Submit the number required by the Contractor plus four (4) copies for the Architect.

C. Certified Test Reports: Before delivery of materials and equipment, certified copies of the reports of all tests listed in the technical sections shall be submitted and approved. The testing shall have been performed in a laboratory meeting the requirements specified herein. Unless otherwise specified the tests shall have been performed within three years of submittal of the reports for approval. Test reports shall be accompanied by the certificate from the manufacturer certifying that the material and equipment proposed to be supplied is of the same type, quality, manufacturer, and make as that tested.

D. Manufacturer's Certificates of Conformance or Compliance: Manufacturer's certification furnished by the Contractor on items of materials and equipment incorporated into the work will be accepted only when this method will assure full compliance with the provisions of the Contract, as determined by the Architect. Pre-printed certifications will not be acceptable. All certifications shall be in the original. The original of all manufacturer's certifications shall name the

appropriate item of equipment or material, specification, standard, or other document specified as controlling the quality of that item and shall have attached thereto certified copies of test data upon which the certifications are based. All certificates shall be signed by the manufacturer's official authorized to sign certificates of conformance or compliance.

E. Laboratory Reports: Reports shall cite the contract requirements, the test or analysis procedures used, the actual test results, and include a statement that the item tested or analyzed conforms or fails to conform to the specification requirements. All test reports shall be signed by a representative of the testing laboratory authorized to sign certified test reports.

1.07 QUALITY CONTROL REQUIREMENTS

A. The Testing Laboratory shall inspect and test all work under the contract and maintain records of the inspections and tests. Approvals, except those required for field installations, field applications, and field tests, shall be obtained before delivery of materials and equipment to the project site.

B. Factory Tests: Unless otherwise specified, the Contractor will arrange for factory tests when they are required under the Contract.

C. Factory Inspection: Unless otherwise specified, the Contractor will arrange for factory inspection when required under the Contract.

D. Field Inspections and Tests by the Owner: The Owner will provide and pay for all equipment, instruments, qualified personnel, and facilities necessary to inspect all work and perform all tests required by the Contract.

E. Approval of Testing Laboratories: All laboratory work under this Contract shall be performed by a laboratory approved by the Owner. The basis of approval includes the following:

1. Testing laboratories performing work not in connection with concrete, steel or bituminous materials shall comply with Sections 3 and 4 of ASTM E329.

F. Repeated Tests and Inspections: The Owner will repeat tests and inspections after each correction made to non-conforming materials and workmanship until tests and inspections indicate that the materials, equipment, and workmanship conform to the Contract requirements. The retesting and reinspection shall be performed by the testing lab. The Contractor shall pay for any retesting and reinspection.

END OF SECTION

SECTION 01505

CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General Conditions and Division One Specification Sections, apply to the Work of this Section with special attention to the following:

1. Section 01010, Summary of Work
2. Section 01200, Project Meetings
3. Section 01400, Quality Control
4. Section 01560, Temporary Controls
5. Section 01700, Contract Close Out

1.02 RELATED WORK

A. Section 02070, Selective Demolition – Recycling of Materials Resulting from selective demolition in Existing Building.

1.03 REFERENCES

A. Environmental Protection Agency, "Waste Wise" Program (www.epa.gov/wastewise/)

B. Institute of Scrap Recycling Industries, Inc., Washington, D.C. (www.isri.org)

C. Triangle J Council of Governments, Research Triangle Park, NC, "Waste Spec" (www.tjcog.dst.nc.us)

1. Appendix A: Preparing Estimates on Recycling
2. Appendix D: Sample Waste Management Plan

1.04 SUMMARY OF WORK

A. The Contractor shall minimize the amount of non-hazardous construction waste disposal into landfills, and shall salvage as much non-hazardous construction waste as possible for shipment to recycling collection centers.

1. Revenues or cost savings resulting from recovery of recycled construction waste materials shall accrue to the Contractor.

B. Provide labor for material handling, provide storage enclosures and containers, signage, transportation and other resources required in order to implement the construction waste management operations described in this section. The Contractor shall maintain a clearly designated on-site collection area for the

temporary stock piling of construction waste designated to be recycled, separated from other non-recyclable materials that shall be disposed of legally.

1. Provide clearly identified enclosures, bins or labeled containers for each type of recyclable waste material to be temporarily stockpiled in the collection area. Include signage listing acceptable or unacceptable materials for each enclosure, bin or container.

2. Locate collection area convenient to work areas, but not in a location that will impede free flow of construction traffic, inhibit performance of construction activities or adversely affect school daily operations. Locate collection area to minimize interference with roads, streets, walkways, and other facilities adjacent to the project site.

3. Provide adequate vehicle access and working clearance for pick up of waste materials for delivery to recycling processing centers.

1.05 QUALITY ASSURANCE

A. The Contractor shall designate a full time, on-site representative to oversee compliance of subcontractors, and other personnel associated with the project, with the construction waste requirements of this Section.

B. Within 30 days of the date of the Notice to Proceed, review construction waste management procedures with Owner's Representative. Include the following:

1. A proposed list of construction waste materials to be recycled to meet a diversion percentage goal of a minimum of 50% of construction and demolition materials to be recycled.

2. A proposed on site location for waste material collection area.

3. A list of local or regional recycling processing centers and the type of materials that each center will accept. The list shall include name, address and telephone number of each center.

4. A description of methods that shall be used for separating and storing construction waste materials, including types of containers and container labeling.

PART 2 - PRODUCTS

2.01 RECYCLABLE MATERIALS

A. Construction waste materials designated for recycling include, but are not limited to, the following:

1. General waste:

a. Paper and beverage containers used by on-site construction staff and workers

2. Uncontaminated packaging and shipping materials:

a. Corrugated cardboard
b. Metal banding/strapping
c. Wood pallets
d. Packing shims
e. Paper wrappings
f. Wood crates
g. Polystyrene packing material

3. Construction metals:

a. Light gauge framing members (cutoffs)
b. Metal floor and roof decking (deck cutouts, etc.)
c. Plumbing/Mechanical piping
    1) Schedule 40 black steel
    2) Copper
    3) Ductile iron
    4) Cast iron
d. Electrical conduit
e. Concrete reinforcing steel
f. Sheet metal (ductwork, metal flashings)
g. Suspension wire
h. Miscellaneous structural framing steel (angles, channels, etc.)

4. Clean unfinished wood:

a. Dimensional lumber
b. Wood trim
c. Wood athletic and stage flooring
d. Wood sheet materials such as plywood

5. Clean, unfinished gypsum board

6. Other construction waste materials identified by Contractor that are capable of being recycled

PART 3 - EXECUTION

3.01 IMPLEMENTATION AND PERFORMANCE

A. The Contractor shall conduct a preconstruction meeting to familiarize subcontractors, fabricators, suppliers, and other personnel associated with the project, with the approved job site waste management procedures and

requirements for recyclable materials. The contractor shall provide each meeting participant with a written copy of the procedures. Include discussion of the following:

1. Waste management procedures for each individual trade.

2. Procedures for separation, handling and stockpiling of construction waste materials.

3. Procedures for periodic waste collection and transport to recycling processing centers.

B. The Contractor shall provide updates of ongoing waste management practices as a recurring agenda item during regular job progress meetings. Discussion shall include the following:

1. Types of construction waste materials currently being stockpiled on site.

2. Verification that correct procedures for separation, handling, stockpiling and transporting are being followed.

3. Verification that periodic and frequent collection and transport of materials to recycling collection centers is being maintained.

3.02 COLLECTION AREA

A. On site collection area shall be established on site plan prior to bidding. Alternate sites may be established until the location has been approved by the Owner's Representative.

3.03 CONSTRUCTION WASTE MATERIAL HANDLING

A. Place, grade and shape material stockpiles to shed surface water. Cover stockpiles where needed to avoid wind blown debris and dust. For stockpiled materials subject to deterioration from weather exposure, store above ground and provide cover.

B. Waste management documentation:

a. Compile weight tickets for all wastes removed from the site including recycled and salvaged materials to document diversion percentages achieved.

b. Recycling summary: Recycle and waste data will be collected into a summary document for construction documentation.

C. Periodically inspect enclosures, bins and containers for contamination and misplaced waste materials. Clean enclosures, bins and containers, and remove contaminated or inappropriate materials.

D. Control the amount of temporarily stockpiled, recyclable waste materials by arranging frequent, periodic removal of materials to off-site collection centers, in order to avoid over-accumulation in the collection area. Remove and transport materials in a manner that will prevent spillage.

E. Organize and store recycled waste materials in tight, dense bundles. Comply with special requirements of collection centers.

F. Wood materials: Sort and stock dimensional materials according to size, type and length.

1. Where possible, arrange for return of wood pallets to material or equipment suppliers and manufacturers. Otherwise, break down pallets into component pieces and sort by size and length.

2. Crates: Break down into component pieces and sort by size and length.

G. Structural Steel: Sort and stack structural steel members according to size, type of member, and length.

H. Gypsum Board: Stack large, uncontaminated pieces on wood pallets and store under cover.

I. Piping and conduit: Reduce tubular items to straight lengths and stockpile by type and size.

J. Sheet metal and metal strapping: Flatten and fold to fit into containers.

K. Cardboard packaging and boxes: Break down into flat sheets. Bundle and store above ground and under cover.

L. Polystyrene packing material: Separate and bag.

3.04 FINAL CLEAN UP

A. At project closeout, ensure that all recyclable construction waste materials have been removed and delivered to collection centers. Remove all enclosures and containers from the Project Site.

B. Re-grade and re-establish all areas disturbed by recycling activities in accordance with the requirements of Division 2, Site Work, and the County approved Civil Drawings.

END OF SECTION

SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Summary of Work: Section 01010.

2. Field Offices and Sheds: Section 01590.

1.02 DESCRIPTION OF WORK

A. Furnish, install and maintain temporary utilities required for construction. Remove temporary utilities upon completion of work.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with Federal, State and Local Codes and Regulations and with utility company requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials may be new or used, but shall be adequate in capacity for the required usage, shall not create unsafe conditions, and shall not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING (ADDITIONS and ALTERATIONS)

A. Make connections to existing service facilities in compliance with governing code, laws, and regulations.

B. Owner will be responsible for paying power charges.

C. Install circuit and branch wiring, with area distribution boxes located so that power and lighting is available throughout the construction by the use of construction type power cords.

D. Provide adequate artificial lighting for all areas of work when natural light is not adequate for work, and for areas accessible to the public.

E. Provide adequate power and artificial light to field offices for Contractor and owner's Representative.

2.03 TEMPORARY HEAT AND VENTILATION

A. Provide temporary heat and ventilation as needed to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation of materials and to protect materials and finishes from damage due to temperature or humidity.

B. Provide adequate forced ventilation of enclosed areas where curing of installed materials occurs, in order to disperse humidity and noxious odors and to prevent hazardous accumulations of dust, fumes, vapors or gases.

C. Portable heaters shall be standard UL approved units complete with controls.

D. Provide adequate heat and cooling to field offices of Contractor and Owner's Representative.

E. Pay all costs of installation, maintenance, operation and removal and for fuel consumed.

F. No extension of time shall be allowed due to Contractor's failure to provide temporary heat.

2.05 TEMPORARY TELEPHONE SERVICE

A. Arrange with local telephone service company, provide direct line telephone service at the construction site for the use of personnel and employees. Service required shall be as follows:

1. One direct line instrument in Field Office, and one dedicated line for fax machine.

2. One direct line instrument for the Owner's Representative, and one dedicated line for fax machine.

3. Other instruments at the option of the Contractor, or as required by regulations.

4. Pay all costs for installation, maintenance and removal, and service charges for local calls. Toll charges shall be paid by the party who placed the call.

2.06 TEMPORARY WATER

A. Make connections to existing facilities, provide water for construction purposes.

B. Owner will pay costs of water used.

2.07 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities in compliance with laws and regulations. See section 01010, Contractor Use of Premises.

B. Service, clean and maintain facilities and enclosures.

C. Provide one separate sanitary facility for the sole use of the Owners Representative, throughout the construction period.

D. Use of school facilities by contractor's personnel is prohibited.

PART 3 - EXECUTION

3.01 GENERAL

A. Comply with applicable requirements in Division 15 - Mechanical, and in Division 16 - Electrical.

B. Maintain and operate systems to assure continuous service.

C. Modify and extend systems as work progress requires.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

C. Restore existing facilities used for temporary service to specified or original condition, fully operational.

END OF SECTION

SECTION 01520

CONSTRUCTION AIDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Section 01010 "Summary of Work" (Safety precautions)

2. Section 01530 "Barriers".

1.02 DESCRIPTION OF WORK

A. Furnish, install and maintain required construction aids; remove upon completion of work.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with Federal, State and local codes and regulations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials may be new or used, suitable for the intended purpose, but shall not violate requirements of applicable codes and standards.

2.02 CONSTRUCTION AIDS

A. Provide construction aids and equipment as required by personnel and to facilitate the execution of the work; including scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes and other such facilities and equipment.

B. Refer to respective sections for particular requirements for each trade.

C. Maintain all facilities and equipment in a first-class condition.

2.03 TEMPORARY ENCLOSURES

A. Provide temporary enclosures to separate work areas from the areas of existing building occupied by Owner; to prevent penetration of dust, fumes, or moisture into occupied areas, to prevent damage to existing equipment, to protect Owner's occupants and operations from construction work, and to prevent entry of

unauthorized persons. Doors in the construction barrier between the additions / renovated areas shall be self-closing.

B. Provide temporary exterior and interior doors and frames with self-closing hardware and padlocks. Springs utilized as closers shall not be permitted. Doors shall be solid core wood or hollow metal, and weather stripped. Provide temporary walk-off mats at each passable entrance between occupied and construction areas in order to minimize dust migration. Mats shall be carpet with non-skid backing. Mats shall be rotated and professionally cleaned on a regular basis, in a manner sufficient to maintain visual cleanliness and mitigate airborne dust in occupied spaces. Mats should be dissimilar to the school's own floor mats, in order to minimize confusion for custodial staff.

C. Where work is phased, enclosures shall be removable as necessary for work being done in each phase. Other enclosures shall be removable as necessary for performance of work and handling of material.

D. Enclosures shall be 3 5/8", 20 gauge minimum metal stud frames with 5/8" gypsum wallboard to meet two-hour rated construction. Frames shall extend from floor to underside of metal deck and shall completely seal off all necessary areas. On exterior enclosures, substitute 1/2" CDX plywood. Tape or otherwise seal panel joints in gypsum board and plywood. Where exterior enclosures form temporary means of egress, provide ½" gypsum sheathing. Insulate exterior enclosures with batt type insulation complying with the requirement of Section 07210, 2.01A.

1. For temporary enclosures or exitways adjacent to work that is occurring overhead, provide structural roof construction that is adequate to protect building occupants using the enclosures or exitways.

2. Secure sole plates of temporary enclosures to existing floors with construction adhesive.

E. Exterior enclosures: Provide 6 feet high temporary chain link construction fencing to enclose construction work areas, material storage areas, and access ways. Fences shall be added or modified to enclose active work and storage areas as the project progresses. All chain link mesh panels shall be secured with clamps, wire ties shall not be permitted. Mesh shall be knuckled at the top and bottom, securely fastened to panel frames and shall be monitored for protruding wires. Barbed wire shall not be permitted.

PART 3 - EXECUTION

3.01 PREPARATION

A. Consult with Architect, review site conditions and factors which affect construction procedures and construction aids, including adjacent properties and public facilities which may be affected by the execution of the Work.

3.02 GENERAL

A. Relocate construction aids as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of Owner and other contractors employed at the site.

3.03 REMOVAL

A. Completely remove temporary materials, equipment and services:

1. When construction needs can be met by use of permanent construction.

2. At completion of the Project.

B. Clean, and repair damage caused by installation or by use of temporary facilities.

C. Grade areas of the site affected by temporary installations to required elevations and slopes, and clean the area.

D. Restore existing and permanent facilities used for temporary purposes to specified or to original condition.

END OF SECTION

SECTION 01530

BARRIERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section with special attention to the following:

1. Summary of Work: Section 01010.

2. Construction Aids, Enclosures: Section 01520.

1.02 DESCRIPTION OF WORK

A. Furnish, install and maintain suitable barriers to prevent public entry, and to protect the Work, existing facilities, trees and plants from construction operations; remove when no longer needed or at completion of Work.

B. Maintenance of Means of Egress

1. The Contractor shall keep open and maintain all existing and temporary fire exits in the existing school during the course of construction.

2. Provide alternate fire exits if necessary including barriers and signs as may be required by local fire official.

3. Contractor shall coordinate and arrange with local fire officials to implement a plan for temporary exiting of existing school building should alternate fire exits be required.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with Federal, State, and local codes and regulations.

PART 2 - PRODUCTS

2.01 BARRIERS

A. Materials shall be determined at Contractor's option, of type, size and quantity as appropriate to serve the required purpose.

PART 3 - EXECUTION

3.01 TREE AND SHRUB PROTECTION

A. The Contractor shall preserve and protect all existing trees and shrubs on or adjacent to the site which have not been designated for removal or relocation. The Contractor shall be responsible for all unauthorized cutting or damaging of trees and shrubs, including damage due to careless operation of equipment materials stockpiles shall not be permitted within branch spread. All trees susceptible to possible damage by equipment shall be boxed with boards and wire to protect the trunk. Barricades shall be erected to prevent operation of heavy equipment within the drip lines of trees to remain.

B. Interfering branches shall be removed without injury to the trunks. Care shall be taken by the Contractor in felling trees authorized for removal to avoid any unnecessary damage to trees and shrubs that are to remain in place. Any branches of trees broken during such operations shall be trimmed in accordance with recommended practice. The Contractor shall replace or restore at his own expense all trees and shrubs not protected as required herein that may be destroyed or damaged by construction operations.

3.02 REMOVAL

A. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed and when approved by the Architect.

B. Clean and repair damage caused by installation. Fill and grade the areas of the site to required elevations and slopes and clean the area.

END OF SECTION

SECTION 01560

TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Construction Aids: Section 01520.

2. Barriers: Section 01530.

3. Cleaning: Section 01710.

1.02 RELATED WORK

A. Related requirements specified in Division 2: Site Work.

1.03 DESCRIPTION OF WORK

A. Contractor shall provide and pay for all controls required by Fairfax County Regulations for noise, dust, water, pest and rodent, debris, pollution, traffic and erosion whether indicated in the Contract Documents or not.

B. All site controls and features shall be constructed and maintained in accordance with the latest edition of the Fairfax County Public Facilities Manual.

1.04 OTHER REGULATIONS

A. All regulations of the Fairfax County Department of Public Works and Environmental Services.

1.05 OPEN BURNING

A. Not Permitted

1.06 EROSION CONTROL

A. The Contractor shall perform the work in such a manner as to prevent the washing of any soil, silt, or debris onto adjacent properties, and shall be held responsible for any damage incurred for a period of one year after date of acceptance of the completed work. This includes construction of berms, siltation pond, collars on structures, etc., or any other device that might aid as a determent to erosion.

B. The Contractor shall construct a siltation trap in natural ground at the base of all perimeter fill slopes. The siltation trap shall be 2 feet deep, 2 feet wide at the bottom with 2:1 side slopes. All excavated material shall be placed on the downhill side of the construction to act as a berm. Minimum one-foot top berms shall be maintained at all times during the construction of perimeter fills.

C. The Contractor agrees to hold the School Board or any of its agents harmless from any and all liability or damage that may arise out of a violation of the Siltation Ordinance and agrees to indemnify them against any loss.

D. If at any time during the construction of this property silt goes offsite and if, when this occurs, the site plan and specifications for siltation and erosion control as approved by Fairfax County are not being complied with, then the Contractor shall pay to the Owner the sum of $5,000 as liquidated damages.

E. This provision for liquidated damages shall be a continuing one and for each and every occurrence there shall be paid to the Owner the sum of $5,000 as liquidated damages.

1.07 INSPECTION AND APPROVAL

A. The County School Board of Fairfax County, Virginia, shall provide an inspector to represent it in the inspections of the work. The presence of this inspector shall in no way be construed by the Contractor as approval of methods or materials that do not conform to the requirements of this Contract.

1.08 TRAFFIC CONTROL

A. The Contractor shall maintain, at his expense, all boundary, adjacent and/or access roads, regardless of status, classification, or ownership, which he or his subcontractor uses, under permit or otherwise during the course of construction of this project. Maintenance shall be performed as needed to keep the road passable at all times, so as to guarantee that other users of the road can travel thereon with a minimum of inconvenience and interruption of normal routine.

B. Contractor shall, at his expense, provide and maintain all traffic control devices, signals, barriers, flares, lights, flagmen, etc. required by law when his operations conflict with the movement of traffic, both vehicular and pedestrian, on dedicated streets and highways.

1.09 PERMITS AND FEES

A. Contractor shall obtain and pay for all permits and fees required for the performance of this Work.

END OF SECTION

SECTION 01580

CONSTRUCTION SIGNS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Summary of Work: Section 01010.

1.02 DESCRIPTION

A. Provide temporary on-site information signs.

1. As required and regulated by codes, laws and regulatory agencies.

2. To identify key elements of the construction facilities.

3. To direct traffic.

B. The Architect and Contractor will be allowed to install their own identification signs.

C. Remove signs on completion of construction.

D. Allow no other signs to be displayed.

1.03 INFORMATION SIGNS

A. Painted signs with painted lettering or standard products.

B. Size of signs and lettering: As required by regulatory agencies or as appropriate to the usage.

C. Colors: As required by regulatory agencies, otherwise of uniform colors throughout the Project.

D. Erect at appropriate locations to provide the required information.

1.04 QUALITY ASSURANCE

A. Sign Painter: Professional Experience in the type of work required.

B. Finishes, Painting: Adequate to resist weathering and fading for the scheduled construction period.

PART 2 - PRODUCTS

2.01 SIGN MATERIALS

A. Structure and Framing: May be new or used, wood or metal in sound condition structurally adequate to the work and suitable for specified finish.

B. Sign Surfaces: Exterior softwood plywood with medium density overlay, standard large sizes to minimize joints.

C. Thickness: As required by standards to span across framing members, to provide even, smooth surface without waves or buckles.

D. Rough Hardware: Galvanized.

E. Paint: Exterior quality.

F. Use Bulletin colors for graphics.

PART 3 - EXECUTION

3.01 INFORMATION SIGNS

A. Paint All Exposed Surfaces: One coat of primer and one coat of exterior paint.

B. Paint graphics in the styles, sizes, and colors as required.

C. Install at a height for optimum visibility, on ground-mounted poles or attached to temporary structural surfaces.

3.02 MAINTENANCE

A. Maintain signs and supports in a neat, clean, condition; repair damages to structure, framing, or sign.

3.03 REMOVAL

A. Remove signs, framing, supports, and foundations at completion project.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Section 01340: Shop Drawings, Product Data and Samples: Submittal of manufacturers' certificates.

2. Section 01700: Contract Closeout.

1.02 WORKMANSHIP

A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. Perform work by persons qualified to produce workmanship of specified quality.

C. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.03 MANUFACTURER'S INSTRUCTIONS

A. When work is specified to comply with manufacturers' instructions, submit copies as specified in Section 01340, distribute copies to persons involved, and maintain one set in field office.

B. Perform work in accordance with details of instructions and specified requirements. Should a conflict exist between Specifications and instructions, consult with Architect.

1.04 DELIVERY AND HANDLING

A. Transport Products by methods to avoid Product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.

B. Provide equipment and personnel to handle Products by methods to prevent soiling or damage.

C. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

1.05 STORAGE AND PROTECTION

A. Store Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive Products with weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

B. For exterior storage of fabricated Products, place on sloped supports above ground. Cover Products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

C. Store loose, granular materials on solid surfaces in a well-drained area; prevent mixing or contact with foreign matter.

D. Arrange storage to provide access for inspection. Periodically inspect to assure that Products are undamaged, and are maintained under required conditions.

E. After installation, provide coverings to protect Products from damage from traffic and construction operations, remove when no longer needed.

PART 2 - PRODUCTS

2.01 Products include materials, equipment, and systems.

2.02 Comply with Specifications and referenced standards as minimum requirements.

2.03 Components required to be supplied in quantity within a Specification section shall be the same, and interchangeable.

2.04 No asbestos materials are permitted to be used in the construction of this project.

PART 3 - EXECUTION

(Not used)

END OF SECTION

SECTION 01630

SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section.

1.02 CONTRACTOR'S OPTIONS

A. For products specified only by referenced performance standards, select a product and manufacturer meeting all the required standards. After award of contract, evidence of conformance shall be submitted in accordance with Section 01340, Shop Drawings, Product Data and Samples.

B. For products specified by naming a list of several products and manufacturers, select any product and manufacturer named on the list. Contractor may propose a directly comparable substitution to the specified items in accordance with the requirements of this section.

C. Products specified by naming one product and manufacturer shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Contractor may propose a directly comparable substitution to the specified item in accordance with the requirements of this Section.

D. For products specified by naming one product and manufacturer followed by the phrase "No Substitution", there shall be no option. The contractor shall not be allowed to propose a substitution to the specified item.

1.03 SUBSTITUTIONS

A. Ten (10) days prior to receipt of bids, Architect will consider formal requests from Contractor for substitution of products; requests received less than 10 days prior to bid due date shall not be considered.

B. Submit 4 copies of request for substitution. Include:

1. Complete data substantiating compliance of proposed substitution with Contract Documents.

2. For Products:

a. Product identification, manufacturer's name and address.

b. Manufacturer's literature indicating product description, performance and test data, reference standards and range of manufacturers colors if item requires color selection.

c. Samples.

d. Name and address of similar projects on which product was used, dates of installation, responsible contacts, and telephone numbers.

3. Detailed description of proposed construction methods with drawing illustrating methods.

4. Itemized comparison of proposed substitution with product(s) or method(s) specified.

5. Data relating to changes in construction schedule.

6. Relation to separate contracts (if applicable).

C. Request for substitution represents that:

1. Contractor has personally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.

2. Contractor will provide the same guarantee for substitution as for product or method specified.

3. Contractor will coordinate installation of accepted substitution into work, making such changes as may be required for work to be complete.

4. Contractor waives all claims for additional costs related to substitution that may arise subsequent to approval.

D. Substitutions shall not be considered if:

1. Subsequent to award of contract, such items are indicated or implied on shop drawings or project data submittals, without formal substitution request submitted as specified in this Section.

2. Acceptance will require substantial revision of Contract Documents.

3. Acceptance will require additional contract time and will adversely affect construction schedule.

E. Substitutions will be considered after the deadline only under the following conditions:

1. The specified product is no longer manufactured.

2. The specified product is not available due to a strike or catastrophic occurrence.

PART 2 - PRODUCTS

2.01 NOT APPLICABLE

PART 3 - EXECUTION

3.01 NOT APPLICABLE

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Section 01010 - Summary of Work.

2. Section 01720 - Project Record Information

3. Section 01730 - Operating and Maintenance Data

1.02 CLOSEOUT PROCEDURES

A. Comply with procedures stated in General Conditions of the Contract for issuance of Certificate of Substantial Completion.

B. Owner will occupy designated portion of Project for the purpose of installation of equipment, conduct of business, under provision stated in Certificate of Substantial Completion.

C. When Contractor considers Work has reached final completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect's inspection.

D. In addition to submittals required by conditions of Contract, provide submittals required by governing authorities, and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.

E. Owner's Representative will issue final change order reflecting approved adjustments to Contract Sum not previously made by Change Order.

F. Ceiling Concealment Inspection.

1. General: Prior to installation of ceiling panels, an inspection shall be conducted to ascertain the quality and degree of completion of all work above the finished ceiling and to record any discrepancies in the Contract Documents. The inspection shall be conducted by the Owner's Representative and the Contractor and recorded on forms provided by the Owner's Representative.
2. Ceiling Suspension System: Grilles, registers, diffusers, light fixtures, and cut panels around fixtures may be installed prior to the inspection,

however, ceiling panels shall not be laid in place until after the inspection and all discrepancies have been corrected.

G. Wall Close-in Inspection: Prior to wall close-in, an inspection shall be conducted to ascertain the quality and degree of completion of all work concealed within walls and record any discrepancies in the Contract Documents. The inspection shall be conducted by the Owner's Representative, Architect, and the Contractor and recorded by the Contractor on forms provided by the Owner's Representative.

H. Copies of the Inspection Reports: Reports shall be prepared by the Contractor with copies to the Owner's Representative, Architect, and the Consulting Engineers. The inspection report shall be annotated as each discrepancy is corrected and any discrepancy remaining at the time of the Final Inspection shall be included on the punch list.

I. Substantial Completion: See Section 00700, General Conditions, paragraph 12.04.

J. Final Inspection: See Section 00700, General Conditions, paragraph 12.05.

1.03 SYSTEMS DEMONSTRATION

A. Prior to final inspection, demonstrate operation of each system to Owner's Representative.

B. Instruct Owner's designated operating and maintenance personnel in operation, adjustment, and maintenance of materials, products, equipment and systems, using the operation and maintenance data as the basis of instruction.

END OF SECTION

SECTION 01710

CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Summary of Work: Section 01010.

1.02 RELATED WORK

A. Each Specification Section: Cleaning for specific equipment, products, or elements of the work.

1.03 WORK DESCRIPTION

A. Execute cleaning, during the course of the Work, and at completion of the Work, as required by General Conditions, and as described in Part 3 of this Section.

B. Nothing in this Section or elsewhere in the Contract Documents shall be construed as relieving the Subcontractors of their individual responsibility to perform periodic clean up of their portion of the Work. Subcontractors shall cooperate with the Contractor to assist in both periodic and final clean up. The Contractor shall enforce this requirement and shall notify each subcontractor of his responsibility for any damage caused by his operations during such cleanups.

C. If the Contractor fails to clean up, the Owner may do so and the cost thereof shall be deducted from the Contract Sum.

1.04 DISPOSAL REQUIREMENTS

A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use only those cleaning materials that will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 CLEANING DURING CONSTRUCTION

A. Execute daily cleaning to keep the Work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.

B. Provide on-site containers for the collection of waste materials, debris and rubbish. Remove containers from the site at project completion.

C. Remove waste materials, debris and rubbish from the site as necessary and dispose of at legal disposal areas away from the site.

D. Where work is performed adjacent to occupied areas, contractor shall utilize HEPA vacuums to minimize and control dust levels. Use of other types of vacuums shall not be acceptable.

E. During the course of construction the building and premises shall present a neat, orderly and workmanlike appearance.

3.02 DUST CONTROL

A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-need basis until painting is finished.

B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.03 FINAL CLEANING

A. Employ skilled workmen for final cleaning.

B. Besides the general broom cleaning and refuse removal, the Contractor shall do the following special cleaning for all trades before the final completion and acceptance of the work.

1. Remove putty stains, soil and paint from all glass and wash and polish same.

2. Clean and polish all finishing hardware.
3. Remove all spots, soil and paint from all ceramic tile work, glazing and mirrors.

4. Clean all plumbing fixtures, accessories and equipment, including all mechanical equipment.

5. Clean all tile, terrazzo, wood, and other finished floors.

6. Clean and vacuum all carpet.

7. Clean premises of all debris and dirt.

8. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels and other foreign materials from sight-exposed interior and exterior surfaces.

9. Polish glossy surfaces to a clear shine.

10. Clean window frames, entrance frames, hollow metal work and all ornamental iron work.

C. Ventilating Systems:

1. Clean permanent filters and replace disposable filters if units were operated during construction.

2. Clean ducts, blower, and coils if units were operated without filters during construction.

D. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

E. Prior to final completion, or Owner occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire Work is clean.

END OF SECTION

SECTION 01720

PROJECT RECORD INFORMATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Section 01730, Operating and Maintenance Data, for pertinent data which shall be included in the Record and Information Booklet.

1.02 DESCRIPTION OF WORK

A. During the course of construction, and as various portions of the work are performed, the Contractor shall record and maintain an accurate accounting of changes or deviations from the Contract Documents, and any other information which elaborates upon, or supplements, the description of work contained in the Contract Documents.

1.03 SUBMITTALS

A. Upon completion of work, Contractor shall forward one (1) complete set of all project record information (as built drawings) including the civil, architectural, structural, mechanical, plumbing and electrical portions of the work, as applicable, to the Architect. Based upon this data, the Architect shall prepare reproducible Project Record Documents.

1.04 QUALITY ASSURANCE

A. Accuracy of Record

1. Make legible entries on each pertinent sheet of drawings, specifications, or other documents as necessary, in order to properly document the entry.

B. Accuracy shall be such that the Architect may reasonably rely upon the information for preparation of Record Documents, and that the information may be reasonably relied upon for future reference and research by the Owner.

C. Entries shall be recorded in a timely fashion upon performance or notification of a change or deviation.

1.05 HANDLING OF RECORD INFORMATION

A. Maintain record information in a secure manner, protected from deterioration, loss or damage until work is completed and the data is ready to be forwarded to the Architect.

PART 2 - PRODUCTS

2.01 PROJECT RECORDS

A. The Contractor shall designate one (1) set of Contract Documents for compiling and maintaining project record data. Each individual part of the Contract Documents shall be designated and clearly labeled as "PROJECT RECORD INFORMATION - JOB SET".

PART 3 - EXECUTION

3.01 MAINTENANCE OF JOB SET

A. Make entries using colored pencil. Add description notes to clarify entry, such as item description, location and reason for the change. "Cloud" or otherwise highlight entries. Use different colors where different entries overlap.

B. All entries shall be dated.

C. Provide record data for in-place arrangements of circuitry, conduit, piping, ductwork, and other systems that are indicated by schematic layouts or diagrams in the Contract Documents. The Owner or Architect may, at his discretion, allow the Contractor to omit record data for items where the elaboration of the layout or diagrams conveys no additional useful information.

3.02 SUBMITTAL TO THE ARCHITECT

A. Upon completion of the work, forward the Project Record Information set to the Architect. The Architect may require the Contractor to perform corrections, provide additional information, or make other revisions necessary for completeness of data. Make all required corrections or revisions and promptly return the set to the Architect.

END OF SECTION

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Shop Drawings, Product Data and Samples: Section 01340.

2. Contract Close-out: Section 01700.

3. Project Record Information: Section 01720

4. Warranties and Bonds: Section 01740.

5. Applicable Divisions 2 through 16 Specifications

1.02 DESCRIPTION OF WORK

A. Compile product data and related information appropriate for Owner's record, maintenance and operation of products, equipment, materials and systems furnished under the Contract.

B. Prepare record, operating and maintenance data as specified in this Section and as referenced in other pertinent sections of Specifications.

C. All information shall be organized into a Record and Information Booklet.

1.03 SUBMITTAL PROCEDURES

A. Prepare three (3) complete copies of the Record and Information Booklet and deliver to the Architect. Provide one (1) additional copy each of the following (including warranties): Special Systems, Communication Systems, House and Stage Lighting Controls and Stage Lighting Systems, Automatic Temperature Controls, and Food Service Equipment.

B. The Architect shall review the booklets for compliance to the requirements specified in this section. If found to be non-complying, the booklets shall be returned to the Contractor for corrections.

C. The Architect shall indicate approval of the booklets by review stamp on each copy and shall forward the booklets to the Owner. The Owner shall not accept the booklets unless they have been reviewed and stamped as approved.

PART 2 - PRODUCTS

2.01 FORM OF SUBMITTALS

A. Prepare data in the form of an instructional manual for use by Owner's personnel.

B. Format:

1. Size: 8 1/2" x 11".

2. Paper: 20 pound, minimum, white, for typed pages.

3. Text: Manufacturer's printed data, or neatly typewritten. All catalog, data, maintenance and cleaning instructions shall be on manufacturer's letterhead, or have other identification indicating the manufacturer as source of information.

C. Drawings:

1. Provide reinforced, punched, binder tab, bind in with text.

2. Fold larger Drawings to the size of the text pages.

D. Provide flyleaf for each separate product, or each piece of operating equipment.

1. Provide typed description of product and major component parts of equipment.

2. Provide indexed tabs.

E. Cover: Identify each volume with typed or printed title "RECORD AND INFORMATION BOOKLET", and the name of the project.

F. Identify on each volume a list of general subject matter covered in the manual.

G. No partial submittals shall be accepted. Contractor shall not deliver Record and Information Booklets to the Architect until all the required documents have been obtained by the Contractor and organized in accordance with the requirements of this Section. Incomplete submissions shall be returned to the Contractor, and all expenses required for resubmission shall be the responsibility of the Contractor.

2.02 BINDERS

A. Commercial quality three-ring binders with durable and cleanable plastic covers.

B. Maximum ring size: 3 inches

C. When multiple binders are used, correlate the data into related, consistent groupings. Mark binders in sequence.

2.03 CONTENT OF BOOKLET

A. Neatly typewritten table of contents for each volume, arranged in a systematic order by specifications divisions.

B. Indicate contractor, name of responsible principal, address, and telephone number.

C. List each product material, piece of equipment, and system required to be included, indexed to the content of the volume. Include serial and/or model numbers of equipment where appropriate, in order to specifically identify such items.

D. List with each product material, piece of equipment and system as appropriate, the name, address and telephone number of the following with the area of responsibility clearly identified for each:

1. Manufacturer.

2. Representative.

3. Subcontractor or installer.

4. Maintenance Contractor as appropriate.

E. Indicate local source of supply for parts and replacement.

F. Identify each product by product name and other identifying symbols a set forth in Contract Documents.

G. Include operating, cleaning and maintenance information.

H. Include copies of each warranty, bond, and service contract issued.

I. Information Sheet: Provide information sheet on manufacturer's letterhead indicating the following:

1. Proper procedures in the event of equipment or systems failure.
2. Conditions that may affect the validity of warranties or bonds.

2.04 PRODUCT DATA

A. Include only those sheets, which are pertinent to the specific product.

B. Annotate each sheet to:

1. Clearly identify the specific product or part installed.

2. Clearly identify the data applicable to the installation.

3. Delete references to inapplicable information.

2.05 DRAWINGS

A. Supplement product data with Drawings as necessary to clearly illustrate:

1. Relations of component parts of equipment and systems.

2. Control and flow diagrams.

B. Coordinate drawings with information in "as-built" drawings, shop submittals or other project record information to assure correct illustration of completed installation.

C. Do not use project record information as operating and maintenance drawings.

D. Organize in a consistent format under separate headings for different procedures.

E. Provide a logical sequence of instructions for each procedure.

F. Items included in each Booklet: The Booklet shall contain a complete description of all products materials, equipment and systems as outlined in Part 3.

PART 3 - EXECUTION

3.01 PRODUCT, MATERIALS, EQUIPMENT AND SYSTEMS DESCRIPTIONS

A. Division 1 - General Requirements

1. Warranties and Bonds: Provide a copy of each warranty, bond and service contract issued. Execute warranties and bonds in accordance with provisions of Section 01740.

B. Division 15 - Mechanical

1. Plumbing Systems: Include the following:

a. Manufacturer's catalog data and parts list for each item of equipment, along with preventative maintenance instructions.

b. Maintenance and lubrication instructions for each item of equipment furnished.

C. Division 16 - Electrical

1. Power, Lighting and Special Systems: Include the following:

   a. Manufacturer's catalog data and parts list for each item of service entrance equipment and each item of electrical sub-distribution equipment, along with preventative maintenance instructions.

   b. Training manuals, where described in the individual sections, are separate from the requirements listed above.

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section, with special attention to the following:

1. Bid Proposal Bonds: Instructions to Bidders.

2. Performance Bond and Labor and Material Payment Bond: Sections 00302 and 00303.

3. General Warranty of Construction: General Conditions, Section 00700 (16.02).

4. Contract Close-out: Section 01700.

5. Operating and Maintenance Data: Section 01730.

1.02 DESCRIPTION OF WORK

A. Compile specified Warranties and Bonds.

B. Co-execute submittals when so specified.

C. Review submittals to verify compliance with Contract Documents.

D. Assemble and format, include in Record and Information Booklets and submit to Architect for review and transmittal to Owner.

1.03 SUBMITTAL REQUIREMENTS

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors.

B. Number of original signed copies required: See Section 01730, submittal procedures.

C. Product or work item: List each firm or manufacturer, with name of Principal or representative, address and telephone number.

1. Product Identification: Provide serial and/or model numbers for specific identification of equipment.

D. Indicate date of beginning of warranty, bond or service and maintenance contract.

E. Specify duration of warranty, bond, or service maintenance contract.

F. Provide information for Owner's personnel:

1. Proper procedure in case of failure.

2. Instances which might affect the validity of warranty or bond.

G. Contractor, name of responsible principal, address, and telephone number.

1.04 FORM OF SUBMITTALS

A. Format:

1. Size 8 1/2" x 11", punch sheets for 3 ring binder.

2. Fold larger sheets to fit into binders.

3. Incorporate into Record and Information Booklets in accordance with format described in Section 01730.

1.05 EFFECTIVE DATE AND DURATION OF WARRANTIES AND BONDS

A. The Contractor shall provide and maintain warranties on all completed work performed under this Contract for a period of one (1) year, unless noted otherwise in the individual specification section. The start of the Warranty Period for all completed work shall commence on the date of legal occupancy by the Owner for each separate phase.

B. All materials, products, equipment, etc. provided under this contract shall carry the manufacturer's standard warranties. Where standard equipment through the manufacturer exceed the periods listed in these specifications, the manufacturer's warranty shall take precedence. **No additional cost extended warranties or service agreements are required under this contract.**

1.06 SUBMITTALS REQUIRED

A. Submit warranties, bonds, and service and maintenance contracts as specified in the respective sections of Specifications, and as specified by this Section.

END OF SECTION

SECTION 02070

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and Division 1 Specifications Sections, apply to the Work of this Section, with special attention to the following:

1. Summary of Work: Section 01010

2. Temporary Utilities: Section 01510

3. Construction Aids: Section 01520 (Temporary Enclosures)

4. Barriers: Section 01530

1.02 REFERENCE STANDARDS

A. Occupational Safety and Health Standards for the Construction Industry (29 CFR Part 1926) as promulgated by OSHA.

1. Subpart D – Occupational Health and Environmental Controls, 1926.62-Lead.

2. Subpart T – Demolition.

B. Virginia Erosion and Sediment Control Handbook

C. Fairfax County Public Facility Manual

1.03 WORK EXCLUDED

A. Information related to asbestos abatement/removal and materials and finishes containing asbestos is indicated on the Drawings, and in the school's Asbestos Containing Materials (ACM) Management Plan, available on site and included at the end of this section. Removal of asbestos containing materials shall be performed by a licensed asbestos abatement/removal contractor retained by the Owner, except as noted in 1.06 below

B. It shall be the responsibility of the Contractor to notify the Owner prior to initiating selective demolition in existing building areas where the presence of asbestos has been identified. Selective demolition shall not commence until asbestos-containing material has been removed.

C. The Contractor shall include a time allowance for notification and abatement/removal operations for identified ACM in his work schedule.

1. A minimum 20-day notification to the EPA and the Virginia State Department of Labor and Industry is required where removal and disturbance of more than 10 LF per 10 SF of ACM is required.

1.04 CONTRACTOR QUALIFICATIONS

A. The Contractor shall have personnel on site during performance of selective demolition who are trained to identify ACM and other hazardous material, and who are familiar with removal procedures for non asbestos containing hazardous materials (See 1.06 below). The Contractor shall provide evidence of certification for these personnel.

B. For removal of existing elevator, the contractor shall use subcontractors licensed for such work. The subcontractor shall obtain a permit for the work and have the work inspected after demolition is complete.

1.05 DESCRIPTION OF WORK

A. General:

1. The contractor shall remove and legally dispose of all equipment and materials indicated on the drawings, including those items that contain regulated hazardous materials, including asbestos containing materials (ACM) as noted below. Regulated hazardous materials shall require specialized disposal in accordance with applicable regulations. The Contractor will coordinate the scheduling of the removal of all hazardous materials with the Owner and provide the Owner with documentation that the hazardous waste is disposed at an authorized waste disposal facility.

a. Regulated hazardous materials include the following:

1) Fluorescent lamps and PCB containing ballasts.

2) Lead paint, glazed surfaces, putty and sealants in windows/frames.

a) Remove primer from existing steel prior to making modifications required by the structural drawings. Where modifications run along the structural steel completely, remove primer from area or work. Where modifications intersects at 90 degrees+/-, remove primer 1 foot each side of the connection for a minimum of 2 feet total.

3) Metal primer on structural steel and steel windows.

4) CFC type refrigerants such as R-12 ("Freon").

5) ACM putty and caulk at steel windows. The Contractor must coordinate removal activities to allow the Owner to schedule the presence of a project monitor. Provide the Owner with documentation that the ACM waste generated is disposed at an authorized waste disposal facility.

6) Wood utility poles treated with creosote.

2. Lead-containing painted and glazed surfaces that contain detectable concentrations of lead, including concentrations less than the definition of LBP, must be handled in accordance with the OSHA Lead in Construction Standard. Contractors performing work that could impact paint films or glazing that have detectable concentrations of lead should be informed of the testing results, and should take appropriate actions to comply with the OSHA Lead in Construction Standard. Appropriate actions would include but not limited to performing air monitoring to measure worker exposure; assuring that the workers are provided with adequate respiratory protection; and assuring that workers are provided with appropriate training.

3. Workers performing demolition of LCSC (lead-containing surface coatings) must have, at a minimum, two-hour lead awareness training in accordance with OSHA Standard 29 CFR Part 1926.62. If LCSC are required to be stripped or removed from the building component substrate, then additional training would be required based upon the measured lead concentration of the surface coating and the airborne lead concentrations measured or anticipated to be generated during the each work activity.

4. The disposal of waste generated during any restoration, renovation, or demolition operations, including items coated with lead paint, is regulated by EPA Standard 40 CFR Part 261, Subpart C.

B. Performance of Work

1. Construction of the proposed work will be performed while school is in use. The Contractor shall give full cooperation to the school administration and staff in scheduling and performing the work.

2. The Contractor shall provide, install and maintain safety and dust barriers as required by applicable health and safety regulations and as specified in Section 01520.

3. The Contractor shall schedule his work and deliveries so as not to interfere with the normal operation of the school, including morning arrivals and afternoon departures.

4. The Contractor shall give seventy-two hours advance written notice to Owner when work is to be performed that might endanger and inconvenience occupants.

5. The Contractor shall provide all erosion and sediment control devices as required by site inspector, owner, owner's agent, architect or engineer.

6. The Contractor shall keep open, protect and maintain all existing fire exits and fire lanes during the entire course of construction.

C. Protection

1. Erect barriers, fences, guard rails, enclosures, chutes, and shoring to protect personnel, structures, and utilities remaining intact.

D. Maintaining Traffic

1. Minimize interference with normal use of roads, streets, driveways, sidewalks, and adjacent facilities.

2. Do not close or obstruct streets, sidewalks, alleys, or passageways without written permission from authorities having jurisdiction.

3. If required by governing authorities, provide alternate routes around closed or obstructed traffic ways.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that areas to be demolished are unoccupied and discontinued in use.

B. Verify that all utilities within the area to be demolished have been cut off and capped.

C. Do not commence work until conditions are acceptable to Architect and Owner.

3.02 PREPARATION

A. Remove items scheduled to be salvaged for Owner, and place in designated storage area. (See 3.05, Salvage).

3.03 DEMOLITION

A. Demolition shall be carried out with care so that portions of building that are to remain will be undamaged. Work on exterior of building shall be done with extreme care to prevent risk or harm to persons or property. Install temporary floors consisting of sisal kraft paper over existing floors that are to remain in areas of work. Do not allow debris to accumulate.

B. Coordinate demolition with work of other trades. Supervise and assist in removal and replacement of existing materials for installation of new mechanical and electrical items. Remove and replace or re-route mechanical, electrical installation as indicated on the drawings and specified or required for installation of new work or remodeling.

C. Walls

1. At areas where windows are removed, protect adjacent work which shall remain.

2. Where openings are cut in walls, such openings shall be cut with care to avoid damage to work that shall remain.

3. Infill masonry shall be toothed, with the exception of face brick which shall be flush vertically with adjoining existing work.

4. New work shall be carefully installed with materials that match existing, and shall conform to existing planes unless indicated otherwise.

D. Finishes

1. Existing ceiling, wall and floor finish or trim that is disturbed or destroyed by these operations shall be replaced to abut adjoining walls, floors, ceiling and new construction with material to match existing.

2. At locations where existing tile floors are disturbed by new construction, existing tile shall be removed to nearest tile joint that parallels new construction and shall be replaced.

E. Connecting work and new work in extension of existing work shall correspond in all respects with that to which it connects, or similar existing work, unless otherwise indicated or specified. Existing work shall be cut, drilled, altered or temporarily removed and replaced as necessary for performance of Contract.

F. No structural member shall be cut or altered without written authorization of Architect.

G. Work remaining in place that is damaged or defaced by work under this contract shall be restored to the original condition at the time of award of contract.

H. If removal of existing work exposes discolored, unfinished surfaces or work out of alignment, such surfaces shall be refinished or material replaced as necessary to make contiguous work uniform and harmonious.

3.04 DISPOSAL

A. Remove demolition debris daily.

B. Do not store or burn materials on site.

C. Transport demolition debris to off-site legal disposal facilities.

1. Hazardous materials such as fluorescent lamps and PCB-containing ballasts shall be disposed of at special collection centers offering specialized recycling and treatment procedures.

3.05 SALVAGE

A. Owner assumes no responsibility for loss or damage to materials or structures on site, salvage value of which Contractor may have reflected in his bid.

B. Right of first refusal: All existing items of construction, building materials and furnishings (doors, frames, hardware, windows, chalkboards, tackboards, kitchen, heating ventilation, air conditioning, plumbing and electrical equipment, etc.) located in renovated or altered areas of the project shall be carefully removed without damage and remain the property of the Owner unless indicated for re-use in the new work. Any equipment not desired to be retained by the Owner shall be removed from the site and legally disposed of by the Contractor.

END OF SECTION

SECTION 02831

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

A. PVC coated Fence fabric posts; rails, tension components and fittings for all fencing including, perimeter and interior site fencing, preschool and kindergarten play areas, and athletic fencing.

B. Excavation for post bases.

C. Concrete anchorage for posts.

1.03 RELATED WORK

A. Section 02930: TOPSOILING and SODDING.

1.04 WORK EXCLUDED

A. Temporary Construction Fence.

1.05 ERECTOR QUALIFICATIONS

A. Minimum of two years of experience installing similar fencing.

1.06 REFERENCES

A. Chain Link Fence Manufacturers Institute (CLFMI) and ASTM F567 - Standard of chain link fence installation.

B. ASTM A120 - Black and hot dip zinc coated (galvanized) welded and seamless steel pipe.

C. ASTM A123 - Hardware (hot-galvanized coatings on products fabricated from rolled, pressed and forged steel shapes, bars, and strip).

D. ASTM C94 - Ready-mixed concrete.

E. ASTM A491 - Aluminum coating of chain link fabric (steel core wire).

F. ASTM F668 - PVC coated steel chain link fabric, class 2B

1.07 SHOP DRAWINGS AND PRODUCT DATA

A. Submit shop drawings and product data in accordance with Section 01340.

B. Clearly indicate plan layout, grid, spacing of components, accessories, fitments, and anchorage.

C. Submit manufacturer's installation instructions and procedures including standard details of fence and gate installation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Anchor Fence, Inc.

B. Sonco Fence, Inc.

C. Cyclone Fence

D. Allied Tube and Conduit (Fence Division)

E. Other domestic manufacturers meeting the requirements of this Section.

2.02 MATERIALS

A. All Fencing

1. Framework: Thermally fused PVC coated, sizes as indicated.

2. Mesh: Thermally fused PVC coated chain link fabric "Standard Industrial" or "Tennis Court" type as indicated.

2.03 CONCRETE MIX

A. Concrete: ASTM C94, normal Portland Cement, 2000 psi at 28 days, 2 inch to 3 inch slump.

2.04 FENCE COMPONENTS

A. Gate Posts:

1. Posts for swing gates shall be of the following nominal sizes for single swing gates or one leaf each of double gates:

a. Gates up to 6' wide shall be 3.00" O. D.

B. Top Rail and Bottom Rail:

1. Top and bottom rail for 72" and 120" fabric shall be 1.66" O. D.

C. Braces: Brace material shall be same as top rail.

D. Fabric: Shall be one or more of the following based upon fence height shown on the Drawings.

1. 72 inches high: One piece of 9-gauge wire woven in a 2-inch chain link diamond mesh pattern. Top and bottom selvage shall have a knuckled finish.

E. Fabric Connections:

1. Fabric shall be securely fastened to all terminal, corner, and gateposts by 1/4 x 3/4 inch tension bars with 11-gauge pressed steel bands.

2. Fabric shall be securely fastened to all line posts with .062 by .375 self-locking line post fabric.

3. Fabric shall be securely fastened to top rail with .062 by .375 self-locking line post fabric.

F. Line Posts: Shall be one or more of the following:

1. All intermediate line posts for 72-inch fabric shall be 1.9" O. D.

2. All posts shall be equipped with tops designed to exclude moisture and to hold top rail.

G. Terminal Posts:

1. All end, corner, and pull posts shall be 3.00" O. D. with tops designed to exclude moisture and to hold top rail.

H. Pipe and Fittings:

1. All pipes shall be standard weight steel, A.S.A. Schedule 40, of domestic manufacture of sizes and weights specified, or Allied SS-40.

2. Fittings: All fittings used in the complete fence assembly shall be of malleable cast iron or pressed steel.

I. Gates:

1. Gates shall be of size and at locations as indicated on the Drawings, complete with latches, stops, keepers and hinges.

2. Frames shall be 1.9" O. D. pipe per linear foot with heavy malleable iron or pressed steel corner fittings securely fastened to provide a rigid frame of ample strength free from sag and twist. Each frame shall be equipped with 3/8-inch diameter adjustable truss rods.

3. Fabric, to match the fence, shall be installed in the frame by means of tension bars and hook bolted at intervals not exceeding 14 inches.

4. Hinges shall be of bearing pattern, of adequate strength for gate, and with large bearing surfaces for fastening in position. The hinges shall not twist or turn under the action of the gate. The gates shall be capable of being opened and closed easily by one person and swing 180 degrees.

5. Malleable iron latches for single-swing gates shall be guillotine-type designed to prevent the gate from opening in the wrong direction.

6. Locking device for double-swing gates shall consist of fulcrum-type latch, a center drop rod, a center gate stop, and two semi-automatic holdbacks (set in concrete).

2.05 FINISH

A. Provide manufacturers standard "Black" PVC coating, thermally fused, ASTM class 2B.

PART 3 - EXECUTION

3.01 GENERAL:

A. Install line posts, corner posts, top rails, post caps, wire fabric and gates to provide a rigid structure for fence heights of 72" as indicated on the Drawings. Note: Unless otherwise indicated on the Drawings, all perimeter site fencing shall be 6' high.

3.02 POST SETTINGS:

A. All posts shall be of sufficient length to provide a minimum 36" setting into concrete footing. Top of footing shall be crowned in order to shed water.

B. Footing diameters shall be as follows:

1. Line posts: 10" minimum
2. Terminal posts: 12" minimum
3. Gate posts: a minimum of 3 times wider than the post diameter.

C. Footings shall consist of 1-2-4 concrete mix.

3.03 TOP AND BOTTOM RAILS

A. Provide top rail couplings approximately every 20 feet.

B. Top rails shall pass through intermediate line post tops and shall form a continuous brace from end to end of each stretch of fence. Fasten to corner posts using heavy pressed steel connections.

C. Bottom rails shall connect to line post using Boulevard clamp.

3.04 BRACES

A. Brace material shall be installed midway between top rail and ground, and shall extend from corner, end, pull and gateposts to the first adjacent line post. Securely fasten to posts using heavy pressed steel connections. Truss from line post back to terminal or gateposts with 3/8" diameter rod and turnbuckle.

3.05 LINE POSTS

A. All posts shall be evenly spaced, 10 feet on center maximum.

3.06 WIRE FABRIC

A. Position bottom of fabric approximately 2" above finish grade with tension wire stretched tight between posts.

B. Fasten fabric to top rail, line posts, braces, and bottom tension wire with ties spaced 14" on center maximum.

C. Fasten fabric to top rail with ties spaced 24" on center maximum.

D. Attach fabric to ends and corners with tension bars and bar clips.

E. Stretch fabric between terminal posts, or at intervals of 100 feet maximum, whichever is the least dimension.

3.07 CLEAN UP

A. Remove all trash, debris and excess materials associated with the work from the job site and dispose of legally.

END OF SECTION

SECTION 02930

TOPSOILING, SEEDING AND SODDING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 through Division 16 Specification Sections, apply to the Work of this Section.

1.03 REFERENCE STANDARDS

A. Fairfax County Public Facilities Manual

B. Virginia Sediment and Erosion Control Handbook

1.04 AREAS TO BE SODDED

A. All areas disturbed during construction that are to receive vegetative stabilization.

1.05 QUALITY ASSURANCE

A. All sod shall be transplanted within 24 hours from the time it is harvested, unless stacked at the project site in a manner approved by the Owner's Representative. Stacked sod shall be kept moist and protected from exposure to wind and sun. Any sod permitted to dry out shall be rejected.

B. Plant sod only during periods of favorable weather when conditions are suitable. Do not place sod at any time temperature is below freezing. No frozen sod shall be used, and no seed or sod shall be placed on frozen, powder-dry or excessively wet soil.

C. Certification of Grass Seed: For each grass seed monostand or mixture, provide information from seed Producer stating the botanical and common name, percentage by weight of each species, percentage of purity, germination, weed seed content, year of production and date of packaging.

D. Soil amendments and rate of application shall be determined by laboratory test on soil.

1. Areas to be seeded or sodded shall have a soil pH range of 6.5 - 7.0. Contractor shall be responsible for ensuring correct soil pH.

2. Test pH level in at least five equidistant locations on the site. Review with the Owner's Representative or Architect who will determine whether the

average soil pH value is within acceptable range. If existing soil pH is adequate, no soil amendments are required.

3. If average pH value is greater than 7.0, add a commercial grade sulfur at rate derived from lab test, over area to be seeded.

4. If average soil pH value is less than 6.5, then agricultural limestone shall be applied at rate derived from lab test.

1.06 SUBMITTALS

A. Submit statement of certification from local nursery from which sod shall be obtained.

B. Upon request, submit square yard of sod to project site for inspection by Architect and owner's representative.

C. Submit certificates, signed by producer and contractor, stating that soil amendments and sod comply with this specification. Certificates to include the following:

1. Limestone: Type, percentage of calcium magnesium carbonates or oxides, and gradation.

2. Fertilizer: Type and analysis.

D. Submit copy of laboratory test results and soil amendment recommendations for review by the Architect and the Owner's Representative.

1.07 DELIVERY, STORAGE AND HANDLING

A. Sod: Harvest, deliver, store and handle sod in compliance with the requirements of TPI's "Specifications for Turfgrass Sod Materials," and "Specifications for Turfgrass Sod Transplanting and Installation" contained in the "Guidelines Specifications to Turfgrass Sodding".

B. Seed: Deliver seed in original sealed, labeled and undamaged packaging.

1.08 GUARANTEE, INSPECTION AND FINAL ACCEPTANCE

A. Guarantee that at end of ninety days after sodding, a healthy first class lawn shall exist.

B. Upon written request from Contractor, at least ten days before date of inspection, Owner or Architect will perform an inspection of sodded areas.

C. After inspection, list of deficiencies or omissions requiring correction will be proposed. Items shall be corrected and are subject to same guarantee and final

inspection until found acceptable. Be responsible for continued maintenance of that portion of the lawn, which, after ninety days, has not been accepted by Owner.

D. Notwithstanding punch list items, Owner will certify in writing substantial completion of lawns and acceptance of work. Upon completion, reinspection of repairs or renewals necessary, Owner will assume responsibility for continued maintenance of lawn.

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Topsoil shall be a natural, friable, granular soil containing organic matter, uniform composition and texture, and free from clay subsoil, stones, week plant root, sticks, gravel, trash or harmful chemicals. Obtain topsoil from project site stockpiles established during clearing operations. The project topsoil shall be amended to meet these specifications. Obtain additional topsoil required for landscape development from off-site sources and transport to the project site at no increase to contract sum. Obtain approval from Architect to supply topsoil from more than one site. Do not excavate or haul topsoil when wet or frozen.

2.02 SOIL AMENDMENTS

A. Limestone: Agricultural grade limestone ground to such fineness that at least 10% passes a 100-mesh sieve, 50% passing a 40-mesh sieve, and at least 90% passes a 20-mesh sieve.

B. Sulfur: Commercial grade sulfur of equal grade, and quality as specified for limestone.

C. Gypsum: Agricultural grade gypsum ground to such fineness that at least 10% passes a 100-mesh sieve, 50% passing a 40-mesh sieve, and at least 90% passes a 20-mesh sieve.

2.03 FERTILIZER

A. Fertilizer: Complete organic or inorganic fertilizer with percentages of nitrogen, phosphoric acid, potash, and trace elements determined by the soil test. Fertilizer shall be delivered to the site in original unopened containers that bear manufacturer's guaranteed statement of analysis. Rate of application shall be determined by the soil test and/or grass product planting recommendations.

2.04 SOD AND SEED

A. Sod: State certified, nursery grown in nearby area, well rooted, free from disease, defects, insect infestation, or any unhealthy or abnormal condition, and free of weeds.

B. Grass Seed: Fresh, clean, dry, new crop seed complying with AOSA "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances. Germination: not less than 95%. Seed purity: not less than 85% pure seed and not more than 0.5% weed seed.

C. Sod and Seed Composition:

1. Tall Fescue (Drought Tolerant, Full Sun Mixture)

a. Certified Tall Fescue Cultivars, a mixture of at least two different types - 95%

b. Certified Kentucky Bluegrass - 5%

2. Medium Quality Bermuda Grass (if specified on contract Drawings)

a. Mohawk Advanced Synthetic Turf-Type

b. La Prima Synthetic Turf-Type

D. Submit statement giving locations of property from which sod is to be obtained and submit square yard sample of sod to site if requested.

PART 3 - EXECUTION

3.01 FINISH GRADE

A. After rough grading has been completed and site cleared of construction debris, cover areas disturbed by construction or rough grade with minimum four inches of topsoil over earth to provide finish grade.

B. Final grades are indicated. Do not allow soil to pond. Firm topsoil by rolling to prevent washing and sinking. Degree of finish shall be that ordinarily obtained with blade grader or scraper. Finish surface to within 0.10 foot above or below established grade elevations indicated.

C. Surface soil of final grade shall be hand raked prior to seeding or sodding. All stones larger than ½ inch in size shall be removed from the application area.

3.02 APPLICATION OF SOIL AMENDMENTS

A. Soil testing shall be made to determine the exact requirements of lime and fertilizer. If soil amendments are required, apply at rates specified. Bond topsoil mix to subgrade and mix soil amendments uniformly into topsoil by tilling, disking or harrowing to five inch depth. Adjacent to existing trees, adjust depth to avoid disturbances of tree roots.

3.03 FERTILIZING:

A. Incorporate fertilizer with soil in same manner as lime, and apply and incorporate with soil simultaneous with liming operations. Type of fertilizer and rate of application shall be as specified.

3.04 SODDING

A. Sod shall be laid smooth, edge to edge, with staggered joints and immediately pressed firmly into contact with sod bed by rolling to eliminate air pockets. True and even surface shall be provided to ensure knitting without displacement of sod or deformation of surfaces of sodded areas. In ditches or swales, sod shall be placed with longer dimension perpendicular to flow of water in ditch. On slopes of 1:4 and greater, the sod shall be laid with staggered joints. Sod shall be secured by stapling or other approved method.

B. Following compaction, screened topsoil of good quality shall be used to fill cracks, and excess soil worked into grass with rakes or other suitable equipment. Grass shall not be smothered with excess fill soil. Exposed edges of sod shall be buried flush with adjacent soil.

C. Sod shall not be laid on soil surface that are frozen. During High temperature, the soil shall be lightly irrigated immediately prior to laying the sod.

3.05 SEEDING

A. Sow seed with spreader or seeding machine. Do not use wet seed or seed that exhibits mold or is otherwise damaged. Broadcast seed evenly by sowing in two directions at right angles to each other. Seed only when wind is calm. Sow Tall Fescue seed at the rate of 5 to 8 lb. per 1000 sq. ft. and Bermuda grass seed at the rate of 3 to 5 lb. per 1000 sq. ft.

3.06 HYDROSEEDING

A. Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until homogeneous slurry is obtained.

B. Mix slurry with specified tackifier and apply uniformly.

C. Apply mulch at rate required to obtain specified seed sowing rate.

3.07 MAINTENANCE

A. Ensure the establishment of a healthy, first class lawn. Be responsible for all maintenance, protection, and repair until Owner accepts planted area. Include watering, rolling, fertilizing and mowing.

B. Maintenance and protection of all seeded and sodded areas shall continue until Owner accepts lawn. Barriers, sign, and/or flags shall be used on established pedestrian circulation ways as determined by Owner to indicate areas where trespassing is not allowed.

C. During the maintenance period repair or re-work washouts, dry areas, dead areas or erosion at no additional cost to Owner. Repair damage by vandalism at no additional cost to Owner.

END OF SECTION

SECTION 16010

ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 DESCRIPTION

A. It is the intent of this Specification that this Contractor furnish and install all material, labor, equipment, apparatus, tools, transportation, and other incidentals required to provide the following: power distribution (both normal and stand-by emergency power); branch circuit wiring; low voltage wiring; wiring devices; grounding; lighting (exterior); as shown on Drawings and as described in these Specifications.

1.02 REQUIREMENTS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

B. Provisions of this Section apply to each and every Section of this Division.

1.03 SCOPE

A. It is the intention of these Specifications and the Contract Drawings to call for finished work, tested and ready for operation.

B Any apparatus, appliances, materials, or work not indicated but mentioned in these Specifications, or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be furnished, delivered, and installed by this Contractor at no additional expense to the Owner.

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

D. With submission of bid, this Contractor shall give written notice to the Architect/Engineer of any materials or apparatus believed: inadequate or unsuitable; in violation of federal, state, and local laws, codes, and ordinances, including Fairfax County's electrical inspection rules or regulations; and any necessary items of the work which have been omitted. In the absence of such written notice, it shall be mutually agreed that the Contractor has included the cost of all required items in the proposal and that the Contractor shall be responsible for the approved satisfactory functioning of the entire electrical system and low voltage electrical systems at no additional expense to the Owner.

1.04 APPLICABLE SPECIFICATIONS, CODES, STANDARDS, AND PERMITS

A. Materials, equipment, and installation shall be in accordance with the requirements of the latest adopted editions of the National Electrical Code (NEC), the Virginia Uniform Statewide Building Code, and these Specifications.

B. Unless otherwise specified herein the work and material shall conform to the applicable requirements of the (latest editions or currently adopted) following codes, standards, and regulations:

1. American National Standards Institute (ANSI).

2. Americans with Disabilities Act Code of Federal Regulation (ADA).

3. Canadian Standards Association (CSA).

4. Electronic Industries Association / Telecommunications Industry Association (EIA/TIA)

5. Fairfax County Fire Marshal's Office.

6. Illuminating Engineering Society (IES).

7. International Building Code (IBC)

8. International Code Council (ICC)

9. National Electrical Code (NEC).

10. National Electrical Contractor's Association (NECA).

11. National Electrical Manufacturer's Association (NEMA).

12. National Fire Protection Association (NFPA).

13. Occupational Safety and Health Association (OSHA).

14. Underwriters Laboratories, Inc. (UL).

15. Virginia Occupational Safety and Health Program (VOSH).

16. Virginia Uniform Statewide Building Code (VUSBC).

C. All electrical materials and equipment shall be new, listed by UL, and bear the UL label. This applies to all equipment for which UL standards have been established and label service is regularly furnished.

D. Equipment not UL (or other testing agencies recognized by VUSBC) labeled and equipment assembled in the field using UL components and not UL labeled as an "assembly", for which standards have not been promulgated, shall be accepted upon certification by A.B.M. ELECRICAL POWER SOLUTIONS (MET ELECTRICAL TESTING), 4390 Parliament Place, Suite Q, Lanham, MD 20706 telephone: 240-487-1900 or ELECTRICAL TESTING CORPORATION, 1701 Edmondson Avenue, #201, Baltimore, Maryland, 21228, telephone 410-526-4700. Cost of such certification shall be included in the base bid and in each quoted cost for alternates and proposed change orders. Electrical equipment that requires certification shall be tested by this Contractor at no additional cost to the Owner.

E. Workmanship shall conform to the "Standard of Installation" published by the NECA. This Contractor shall provide a minimum of one (1) valid licensed journeyman electrician (Foreman) to be present at all times while work is being performed. License shall be issued by the Commonwealth of Virginia. Such certification shall be provided to the Architect/Engineer upon request.

F. This Contractor shall: give all necessary notices; obtain all permits (including a low voltage wiring permit); pay all government taxes, fees, and other costs including, but not limited to the Fairfax County Fire Marshals Office shop drawing review fees; file all necessary plans; prepare all documents; and obtain required certificates of inspection for work and deliver same to the Architect/Engineer before any request for acceptance and final payment for the work.

G. This Contractor shall be responsible for purchasing equipment and appliances that bear the label of an agency as approved by the Fairfax County Department of Public Works and Environmental Services (DPWES). It shall be the responsibility of the Contractor to pay for any label testing of equipment or appliances that are installed without the label of a DPWES approved agency.

1.05 REVIEWS AND SHOP DRAWINGS

A. The materials, workmanship, design, and arrangement of all work installed under this contract shall be subject to the review of the Architect/Engineer and Owner.

B. Where any specified materials, process, or method of construction or manufactured article is specified by name, or by reference to the catalog number of a manufacturer, the specifications are to be used as a guide and are not intended to take precedence over the basic duty and performance specified or noted on the Drawings.

C. In all cases, the Contractor shall verify the duty and available electric characteristics with the specific characteristics of the equipment offered for review.

D. All component parts of each item of equipment or device shall bear the

manufacturer's name plate giving name of manufacturer, description, size, type, serial or model number, electrical characteristics, etc., in order to facilitate maintenance or replacement. The nameplate of a Contractor will not be acceptable.

E. If materials or equipment are installed before they have been reviewed by the Architect/Engineer, the Contractor shall be liable for their removal and replacement at no additional expense to the Owner, if in the opinion of the Architect/ Engineer, material or equipment does not meet the intent of the Drawings and Specifications.

F. This Contractor shall call to the attention of the Architect/Engineer by letter or on shop drawing submittals, any instance in which the shop drawings differ from the requirements of the Drawings and Specifications.

G. Data and shop drawings shall be coordinated and included in a single submission in a bound format. Multiple submissions are not acceptable except where prior approval has been obtained from the Architect/Engineer. In such cases, a list of data to be submitted later shall be included with the first submission. No delays in construction occasioned by the Contractor's failure to submit material in accordance with the approval schedule will be excused.

H. Catalogs, pamphlets, or other documents submitted to describe items on which review is being requested shall be specific and identifications in catalog, pamphlets, etc., of items submitted shall be clearly made in a contrasting ink. Data of a general nature shall not be acceptable.

I. Submitted samples, drawings, specifications, catalogs, and the like shall be properly labeled and shall indicate: specified service for which the material or equipment is to be used; Section and Article number of Specifications governing; contractor's name; and name of the job.

J. Data and shop drawings shall be identified in accordance with SECTION 01340. In addition, shop drawings shall be identified by the name of the item and system and the applicable Specification paragraph number. This Contractor shall submit the following components/systems described herein and as specified in other Sections of this Specification.

1. Boxes including device, junction, outlet, and pull types.

2. Conduit and associated fittings.

3. Emergency/standby engine generator set, remote annunciator panel, and automatic transfer switch(es).

4. Fuses and spare fuse cabinet.

5. Grounding system, including rods, connectors, and welds.

6. Lighting fixtures including lamps, ballasts, and poles.

7. Wires, cables, and connectors.

8. Wiring devices.

K. No item or system listed in the schedule above shall be delivered to the site or installed until successful completion of the review. After review of the proposed materials has been successfully completed, no substitution shall be permitted except where approved by the Architect/Engineer in writing. Should the Contractor fail to comply with the requirements of this paragraph, the Owner reserves the right to select any and all items and systems required by this Specification. Materials so selected shall be used in the work at no additional expense to the Owner.

L. The successful review rendered on shop drawings shall not be considered as a guarantee of building conditions. Where shop drawings have been successfully reviewed, said review does not mean that the drawings have been checked in detail and does not in any way relieve the Contractor from the responsibility, nor the necessity of furnishing the material or performing the work as required by the Drawings and Specifications.

M. Failure to submit shop drawings that meet the requirements of the Drawings and Specifications in ample time for review shall not entitle the Contractor to an extension of contract time, and no claim for extension by reason of such default shall be allowed.

N. All equipment and materials to be furnished under this Division of these Specifications shall be as manufactured by the manufacturer(s) listed on the Drawings or herein specified. All requests by any bidder to provide equipment and/or material manufactured by a manufacturer not listed on the Drawings or specified herein, including equipment identified as "OR EQUAL" to a listed manufacturer, must be submitted to the Architect/Engineer not less than ten (10) calendar days prior to the bid date. Any and all replies to said requests will be made in the form of an addendum which shall be made available to all bidders. Any equipment and/or materials installed by this Contractor not manufactured by a specified manufacturer or covered under an addendum shall be removed by this Contractor and the proper equipment or materials installed at no additional expense or delay to the Owner.

O. This contractor shall furnish to the Owner, after approval of shop drawings, three (3) wiring sample boards. Each sample board shall be made of minimum space ½" thick plywood and sized as required to accommodate all wiring samples. Each board shall be painted white and shall have samples of fire alarm, all sound reinforcement systems (divided by system), multi-media, security, CATV, door

access video entry, and telecommunications wiring. Each wiring sample shall be a minimum of 6 inches long with the manufacturer and model number clearly visible. Each wiring sample shall be properly labeled for its intended purpose using a labeling machine.

1.06 EQUIPMENT DEVIATIONS

A. Where this Contractor proposes to use, and/or uses, an item of equipment other than that specified or detailed on the Drawings, which requires any redesign of any other part of the electrical, mechanical, or architectural layout, all such redesign and all new drawings and detailing required shall be prepared by this Contractor at no additional expense to the Owner and shall be reviewed by the Architect/Engineer.

B. Where such approved deviation requires a different quantity and arrangement of duct work, piping, wiring, conduit, and equipment, this Contractor shall furnish and install any such duct work, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system at no additional expense to the Owner.

1.07 QUALIFICATIONS FOR BIDDERS

A. This Contractor shall examine drawings and Specifications relating to the work of all trades and become fully informed as to the extent and character of work required and its relation to all other work in the project prior to submission of bid or prior to the start of any construction.

B. Before submitting bid, this Contractor is encouraged to visit the site and examine all adjoining existing buildings, equipment, and space conditions including areas above accessible ceilings on which his work is in any way dependent, for the best workmanship and operation according to the intent of the Specifications and Drawings. This Contractor shall verify dimensions and become fully informed as to the nature and scope of the proposed work and also the conditions under which it is to be conducted. This Contractor shall report to the Architect/Engineer any conditions which, in their estimation, might preclude them from installing the equipment and work in the manner as intended and noted on the Drawings and in this Specification. Failure to take the above precaution shall in no way relieve this Contractor from his obligation to provide the material and work as indicated and as specified at no additional expense to the Owner within the stipulated completion time period.

C. No consideration or allowance shall be granted for failure to visit the site, or for any alleged misunderstanding of materials to be furnished, or work to be done, it being agreed that tender of proposal carried with it agreement to items and conditions referred to herein or indicated in the Drawings.

1.08 TEMPORARY FACILITIES:

A. Temporary facilities shall be as specified under SECTION 01510 TEMPORARY UTILITIES. Requirements therein are hereby made a part of this Section as if fully specified herein.

B. Contractor shall coordinate with the construction phasing of the building in order for this contractor to provide power and systems cabling and devices for the temporary relocation of the existing administrative offices, media center and other essential school operational areas as directed by the Owner.

1.09 DRAWINGS

A. The Drawings are diagrammatic and indicate the general arrangement of systems and work included in the Contract. Do not scale the drawings. Consult the Drawings for the exact location of fixtures and equipment. Where same are not definitely located, this Contractor shall obtain this information from the Architect/Engineer.

B. This Contractor shall follow the Drawings in laying out work and check the Drawings of other trades to verify spaces in which work is to be installed. This Contractor shall maintain maximum headroom and space conditions at all points. Where headroom or space conditions appear inadequate, this Contractor shall notify the Architect/Engineer before proceeding.

C. This Contractor shall call to the attention of the Architect/Engineer of any conflicting information in the Contract Drawings and/or Specifications, by letter or Request for Information (RFI) process. Contractor shall not proceed in error. Conflicts must be resolved.

D. If directed by the Architect/Engineer, this Contractor shall, at no additional expense to the Owner, make reasonable modifications in the layout as needed to prevent conflict with other trades for proper execution.

E. When failure by this Contractor to comply with the work set forth in the above paragraphs results in a conflict, the work shall be modified by this Contractor as directed by the Architect/Engineer at no additional expense to the Owner.

1.10 CONTRACTOR'S WARRANTY

A. This Contractor shall warrant the workmanship, materials, and equipment against defects and/or non-operation as described in SECTION 01740 WARRANTIES AND BONDS.

1.11 COOPERATION WITH OTHER TRADES

A. This Contractor shall give full cooperation to other trades and shall furnish in

writing to the Architect/Engineer any information necessary to permit the work of all trades to be installed satisfactorily with the least possible interference or delay.

B. Where the work of this Contractor will be installed in close proximity to work of other trades, or where there is evidence that work shall interfere with the work of other trades, this Contractor shall assist in working out space conditions to make a satisfactory adjustment. This Contractor shall prepare composite working drawings at a scale not less than 1/4 inch equals 1'-0", clearly showing how the work is to be installed in relation to the work of the other trades. If this Contractor installs the work before coordinating with other trades or as to cause any interference with work of other trades, this Contractor shall make necessary changes to the work to correct the condition at no additional expense to the Owner.

C. This Contractor shall furnish to other trades, all necessary templates, patterns, setting plans, and shop details for the proper installation of the work and for the purpose of coordinating adjacent work.

PART 2 - PRODUCTS

2.01 STANDARD PRODUCTS

A. Unless otherwise shown on the Drawings or herein specified, each item of equipment furnished by this Contractor shall be essentially the standard product of the manufacturer. Where two (2) or more equipment items of the same kind or class or equipment are required, they shall be the product of a single manufacturer.

B. For equipment consisting of an assembly of multiple components, such multiple components do not have to be the products of a single manufacturer.

2.02 PERFORMANCE DATA

A. All performance data specified herein shall be considered actual performance of equipment as installed. If installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated, suitable allowance shall be made by this Contractor.

2.03 QUIET OPERATION

A. All equipment, including the emergency engine generator set, shall operate under all conditions of load without transmission of sound and/or vibration which is found to be objectionable in the opinion of the Architect/Engineer. In case of sound or vibration noticeable outside of the room or space in which it is installed,

or annoyingly noticeable inside its' own room or space, it shall be considered objectionable. Sound or vibration eliminators as recommended to eliminate any objectionable sound or vibration shall be furnished and installed by this Contractor if deemed necessary by the Architect/Engineer.

2.04 ELECTRICAL WORK

A. Power supply wiring for all equipment shall be furnished and installed under this Division of these Specifications.

2.05 PLATES AND SLEEVES

A. All electrical system conduit shall have sleeves for passing through slabs except concrete slabs in contact with grade. All conduit 1-1/2 inch and larger shall have sleeves where the conduit passes through masonry, concrete, tile, and gypsum wall construction. Conduit passing through concrete slabs on grade shall not require sleeves.

B. This Contractor shall furnish and install sleeves in exterior walls below grade for conduits and, the space between the conduit and the sleeve shall be packed with

silicon and made completely watertight.

C. This Contractor shall fasten sleeves securely in floors and walls so that they will not become displaced when concrete is poured or when other construction is built around them. This Contractor shall take precautions to prevent concrete, plaster, or other materials from being forced into the space between the conduit and sleeve during construction.

1. This Contractor shall terminate sleeves flush with walls, partitions, and ceilings.

2. In areas where conduits are concealed, this Contractor shall terminate sleeves flush with the floor.

3. In finished areas, where conduits are exposed, this Contractor shall terminate sleeves below the floor and cap. In rooms having floor drains, this Contractor shall extend sleeves 3/4 inch above the floor.

D. Escutcheon plates shall be furnished and installed by this Contractor for all exposed conduits passing through walls, floors, and ceilings. Plates shall be nickel-plated, of the split ring type, and of a size to match the conduit. Where plates are provided for conduits passing through sleeves that extend above the floor surface, this Contractor shall furnish and install deep recessed plates to conceal the sleeves.

E. Sleeves shall be constructed of galvanized rigid steel conduit unless otherwise indicated on Drawings.

2.06 FOUNDATIONS FOR EQUIPMENT

A. The Contractor shall construct reinforced concrete foundations for floor mounted equipment where indicated on the Drawings. Foundations generally shall be built up from structural floor slabs and shall be made of 3500 psi concrete twelve (12) inches thick unless otherwise indicated or specified. Top edges shall be beveled. All exposed surfaces shall be finished with cement mortar troweled smooth. Reinforcing shall be 6 x 6-10/10 welded wire mesh.

B. Equipment shall be secured to foundations by this Contractor with anchor bolts embedded in the concrete of ample size and proper arrangements to suit equipment furnished.

PART 3 - EXECUTION

3.01 INSTALLATION OF WORK

A. This Contractor shall examine the site and all Drawings before proceeding with the layout and installation of this work.

B. This Contractor shall arrange the work essentially as shown on the Drawings, exact layout shall be made on the job to suit actual conditions. This Contractor shall confer and cooperate with other trades on the job so all work shall be installed in proper relationship. Precise location of parts to coordinate with other work shall be the responsibility of this Contractor.

C. This Contractor shall arrange for required sleeves and openings. This Contractor shall be liable for cutting or patching made necessary by failure to make proper arrangements in this respect.

D. This Contractor shall provide a full time Job Foreman who shall oversee and coordinate the work with other trades and make proper layout of the work to suit the job conditions and to satisfy the general requirements of the Contract.

3.02 DELIVERY AND STORAGE

A. All materials and equipment shall be delivered in the manufacturer's original packages with seals unbroken and with manufacturer's name and contents legibly marked thereon. This Contractor shall store all materials off the ground, under cover, and protected from the weather and construction.

3.03 SCAFFOLDING, RIGGING, AND HOISTING

A. Unless otherwise specified, this Contractor shall furnish all scaffolding, rigging,

hoisting, shoring, and services necessary for the erection and delivery into the premises of any equipment and apparatus furnished and removal of same from premises when no longer required.

3.04 EXCAVATING AND BACKFILLING

A. Mass excavation to approximate building level shall be carried out under DIVISION 1 of these Specifications. This Contractor shall do all trench and pit excavation and backfilling required for the electrical work inside and outside the building, including: repairing of finished surfaces; all required shoring, bracing, pumping; re-stripping; and all protection of safety of persons and property. The

method of backfilling shall conform to the requirements of Fairfax County. In addition, it shall be the responsibility of this Contractor to check the indicated elevations of utilities entering and leaving the building. If such elevations require excavations lower than the footing levels, the Architect/Engineer shall be notified of such conditions and redesign shall be made before excavations are commenced. It shall also be the responsibility of this Contractor to make the excavations at the minimum required depths in order not to undercut the footings.

B. Conduits installed below the ground floor level shall have the bottom of the trench excavated to grade so that the conduit shall rest on a solid bed of undisturbed earth. If rock is encountered, the trench shall be excavated to not less than three (3) inches below required grade and filled to required grade with sand so as to provide a solid bed under the entire length of conduit.

C. Where the trench is excavated below the required depth, the trench shall be filled with sand and fine gravel so that the entire length of conduit rests on solid bed of sand.

D. Backfilling to one (1) foot above the top of the conduit pipe shall be done by hand, using clean dirt free of rocks or other debris. All backfill shall be properly compacted in accordance with DIVISION 2 of this Specification. Utility tracing tape shall be placed by this Contractor above underground electrical work approximately one (1) foot below finished grade for the entire length of the installation.

3.05 ACCESSIBILITY

A. This Contractor shall be responsible for the sufficiency of the size of shafts and chases, the adequate thickness of partitions, and the adequate clearance in double partitions and hung ceilings for the proper installation of the work. This Contractor shall cooperate with all other trades whose work is in the same space, and shall advise each trade of their requirements. Such spaces and clearances shall, however, be kept to the minimum size required.

B. This Contractor shall locate all equipment that must be serviced, operated, or

maintained in fully accessible positions. This equipment shall include, but not be limited to, disconnect switches, panelboards, transformers, controllers, switchgear, motor control centers, generators, junction boxes and pullboxes, and the like. If required for better accessibility, this Contractor shall furnish access doors or panels for this purpose. Minor deviations from the Drawings may be made to allow for better accessibility, and all changes shall be approved by the Architect/Engineer.

C. This Contractor shall furnish and install access panels as required for access to junction boxes, etc. The panels shall be twelve (12) inches square, unless otherwise required to be larger, with hinged metal door and metal frames. Door and frame shall be not lighter than sixteen (16) gauge sheet steel. Access panels
shall be the flush type with screwdriver latching device. The frame shall be constructed so that it can be secured to the building material. Access panels and their locations shall meet with the approval of the Architect/Engineer.

3.06 DEMOLITION

A. This Contractor shall perform all demolition work as shown on the Drawings and specified herein.

B. The procedures used for the accomplishment of demolition work shall provide for safe conduct of the work, careful removal and disposition of material specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services.

C. Work shall be performed in sequence, locations, and time periods as agreed to by the Owner prior to commencement of work.

D. The amount of dust resulting from demolition shall be controlled to avoid creation of a nuisance in the surrounding area. Masks shall be worn for protection against dust inhalation by all persons in the vicinity of work involving removal of masonry.

E. Protection of existing work:

1. Existing work and finishes to remain shall be protected from damage. Work damaged by this Contractor shall be repaired to match existing work at no additional expense to the Owner.

2. This Contractor shall cover equipment as necessary to protect it from dust.

3. Floors shall be protected by this Contractor from damage.

4. At the end of each workday and during inclement weather, this Contractor shall close exterior openings with weatherproof covers.

5. At the end of each workday this Contractor shall broom clean the entire project.

F. This Contractor shall comply with all Federal and local regulations pertaining to environmental protection.

G. Existing equipment and materials shall be dismantled and/or cut-up so as to be removable through existing access passages. No alterations to the building shall be made for the purpose of removing existing equipment and material.

H. All equipment removed shall remain in the property of the Owner and shall be stored or disposed of as directed.

I. Clean-up:

1. This Contractor shall remove debris and rubbish from the site. Do not allow to accumulate in building or on site.
2. This Contractor shall remove and transport debris in a manner so as to prevent spillage on site or adjacent areas.

3. Local regulations regarding hauling and disposal shall apply.

J. Modifications to Existing Electrical Systems:

1. This Contractor shall ensure that all demolition and modifications to existing electrical systems and associated equipment shall be by a qualified electrician.

2. This Contractor shall remove such existing work as called for on the Drawings and/or as required to clear the areas for new construction. Remove each item of equipment, devices including low voltage devices, luminaires (lighting fixtures), etc. and it's associated circuitry back to the source of power (switchboard, panelboard, controller, control panel, equipment rack, etc.). Associated circuitry includes conduit, conductors, boxes, wiring devices, coverplates, lamps, ballasts, wireways, switches, starters, etc. which are associated with the item being removed.

3. Except as otherwise noted on the Drawings, all existing electrical work which will not be rendered obsolete and which may be disturbed due to any changes required under this Contract shall be restored to it's original operating condition. Contractor shall make all necessary provisions to maintain **ALL** electrical systems, including communications and other low voltage systems, by extending wiring, conduit, relocating equipment, installing new temporary equipment and/or wiring, etc.

4. Electrical work or material rendered obsolete shall be abandoned where concealed in walls and floor slabs and removed where exposed, and/or where made exposed by the removal of walls and/or ceilings. Where a concealed conduit is abandoned and the terminated end is exposed above an accessible ceiling the end shall be capped or sealed in an approved manner. Where a concealed abandoned conduit is terminated in a finished space the conduit shall be removed to below the finished surface (minimum three inches for concrete floor slabs) and the void filled with non-shrinking grout and finished to match the surrounding surfaces.

5. Unused flush device outlet boxes or junction boxes shall be provided with blank coverplates.

6. Where equipment is identified or required to be relocated its associated circuitry shall also be removed, as herein before described, along with it's associated devices, etc. Provide all electrical connections to the relocated equipment to new or extended circuitry as indicated on the Drawings and/or required to make the equipment fully functional.

7. Power, communications and other low voltage systems that will be reconnected or extended permanently or temporarily shall be identified and marked above the ceiling during the demolition and phased construction periods.

8. Where existing electrical work interferes with new work, and where such installations are to remain in use, the installation shall be disconnected and/or reconnected to coordinate with the work indicated on the Drawings and as herein specified.

9. Except as otherwise indicated, panelboard cabinets shall not be used for other purposes than circuit protection and distribution points and shall not be used as junction or pullboxes.

3.07 CUTTING AND PATCHING

A. All cutting and patching of existing construction required for work under this DIVISION of these Specifications shall be performed by this Contractor in accordance with SECTION 01045 CUTTING AND PATCHING.

3.08 PERSONNEL INSTRUCTION AND OPERATING INSTRUCTIONS

A. This Contractor shall furnish to the Architect/Engineer for delivery to the Owner, four (4) bound and indexed copies of an approved operations and maintenance instruction booklet along with a copy of the submittal data for each item of equipment installed under this Contract. The submittal data shall include all low voltage "special systems" drawings and floor plans, updated to include any

deviations to the system(s) and/or the building layout to properly reflect "as built" conditions.

B. After all tests are conducted and approved as specified below, this Contractor shall furnish a competent operations engineer for a period of two (2) days to instruct and demonstrate to the Owner, or his authorized representative, the operation of each system. This Contractor shall notify the Architect/Engineer in writing of the person to whom this instruction was given and the date given. This Contractor shall provide at least one (1) week's notice to the Owner when conducting tests or demonstrations of equipment.

C. This Contractor shall furnish to the Owner as part of the Owner's operating and personnel instruction package, one (1) bound set of marked up drawings indicating any changes made during construction to the original contract drawings. The set shall be clearly labeled, "As Built Plans."

D. This Contractor shall furnish complete Technical Service Manuals with component schematics and parts lists as indicated in appropriate section for each system.

3.09 EQUIPMENT SUPPLIERS INSPECTION

A. The following equipment and systems shall not be placed in operation until a competent installation and service representative of the manufacturer has made an on the job inspection of the installation, has certified that the equipment is properly installed and lubricated, that preliminary operating instructions have been given, and that equipment is ready for operation

1. Emergency engine generator set and automatic transfer switch(es).

3.10 TESTS

A. This Contractor shall, at his expense, conduct a capacity and general operating test on each system. The test shall demonstrate the specified capacities of the various pieces of equipment, and shall be conducted in the presence of the Architect/Engineer and the Owner. The general operating tests shall demonstrate that the entire equipment system is functioning in accordance with the Drawings and Specifications. This Contractor shall furnish all instructions, test equipment, and utilities.

B. After all systems are completely tested, this Contractor shall submit four (4) copies of the test results to the Architect/Engineer for review. Final inspection shall not be made until test results have been reviewed by the Architect/Engineer.

3.11 CLEANING

A. This Contractor shall thoroughly clean all electrical equipment installed under this DIVISION of these Specifications after the system has been completed or used for temporary service, but in any case prior to final inspection by the Owner's representatives.

B. Cleaning shall include, but not be limited to, luminaires (lighting fixtures), wiring devices, cover plates, distribution equipment, and the like.

3.12 GUARANTEE

A. This Contractor shall guarantee by acceptance of the contract that all work installed shall be free from any and all defects in workmanship and/or materials, and that all apparatus shall develop capacities and characteristics specified, and

that if during the phased construction and warranty period such defects in workmanship, materials, or performance appear, this Contractor shall with no additional expense to the Owner, remedy such defects within a reasonable time. In default thereof, Owner may have such work done and charge the cost to this Contractor.

3.13 IDENTIFICATION

A. This Contractor shall furnish an "As-Built" power systems riser diagram indicating panelboards, emergency engine generator set, automatic transfer switch, and safety switches. Diagram shall indicate size of feeders and conduit, breakers, circuit, and fuses. The diagram shall be neatly drawn, using mechanical drafting methods, at least 24 inches x 36 inches, laminated, and hung from the wall adjacent to service entrance switchboard as directed by the Owner.

B. This Contractor shall refer to the appropriate sections of these Specifications for identification requirements for junction boxes, branch and feeder conductors, underground wiring, low voltage special systems wiring and the like.

3.14 LOCK-OUT/TAG-OUT PROCEDURES

A. This Contractor shall have an established lock-out/tag-out procedure which meets the requirements of VOSH Standard 29 CFR Part 1910, Subpart J, Subsection 147, entitled "Control of Hazardous Energy Sources". This Contractor shall coordinate with the Owner's representative to insure conformance with the Owner's lock-out/tag-out program requirements.

END OF SECTION

SECTION 16110

CONDUITS, RACEWAYS, FITTINGS AND CABLE TRAYS

PART 1 - GENERAL

1.01 REQUIREMENTS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 SCOPE

A. The work covered under this Section shall consist of furnishing and installing conduits, raceways, and fittings for all systems as shown on the Drawings and herein specified.

1.03 QUALITY ASSURANCE

A. All equipment, materials, and their installation shall conform to the requirements of the National Electrical Code (NEC), local code requirements, and these Specifications

B. All equipment and materials shall be listed by Underwriters Laboratories, Inc. (UL) for their intended use and shall bear the UL label.

C. Equipment shall be constructed in accordance with National Electrical Manufacturer's Association (NEMA) standards.

D. Submittals are required in accordance with SECTION 16010 of these Specifications for conduits, raceways, fittings, wiring troughs, cable hooks, and associated support systems.

PART 2 - PRODUCTS

2.01 CONDUITS

A. Minimum conduit size shall be 1/2 inch. No more than six (6) No. 12 AWG conductors shall be pulled in 1/2 inch conduit. For conductors larger than No. 12 AWG or quantities of No. 12 greater than six (6) conductors, 3/4 inch conduit shall be the minimum size. Other sizes shall be as indicated on the plans, or as required by the NEC for number and size of conductors installed. Materials shall be new and full length. Crushed and/or deformed conduits shall <u>not</u> be used.

B. The conduits for the fire alarm system shall be red in color.

C. Rigid steel and intermediate metal (IMC) conduits shall be full weight threaded

and galvanized steel pipe of standard pipe dimensions.

D. Electrical metallic tubing (EMT) shall be threadless thin wall conduit, galvanized or zinc metallized.

E. Flexible steel conduit shall be single-strip type, galvanized. Use for short connections where rigid type conduits are impractical, for expansion joint crossing, from outlet box to a recessed luminaire (lighting fixture) (minimum, 4 feet; maximum, 6 feet in length), for final connections to motor terminal boxes or other vibrating equipment. Use only steel connectors approved for flexible conduit. Provide an internal ground wire with proper fittings. Other uses on the project shall not be permitted.

F. Flexible weatherproof conduit shall have polyvinyl sheathing similar to AMERICAN METAL HOSE "Sealtite" type "UA" and shall be used where exposed to the weather to connect all motors; all rooftop mounted equipment, and all other wet locations, where rigid type conduits connections are impractical. Weatherproof flexible conduit installations shall have maximum lengths of ± twenty-four (24) inches. Use only steel connectors approved for flexible weatherproof conduit. Provide an internal ground wire with proper fittings. Other uses on the project shall not be permitted, except where indicated hereinafter in these specifications or as shown on the drawings.

G. Plastic conduits shall be installed only underground or in a concrete slab on grade. Only heavywall (Schedule 40) plastic conduit shall be used. Where conduit turns out of a concrete slab or finished grade, inside or outside the building, provide a rigid steel conduit elbow and suitable adaptor between plastic and steel conduits. No plastic conduit shall be used inside the building or exposed outside the building, unless otherwise noted on the Drawings.

2.02 FITTINGS

A. Fittings, couplings, and accessories shall be compatible with the conduit material.

B. Unions, couplings, and fittings for rigid and IMC conduits shall be of galvanized steel of conventional dimensions and shall be internally threaded at each end to fit the nontapered thread standard for the corresponding size conduit. Couplings and fittings for electrical metallic tubing shall be of steel and shall be of the compression or setscrew type. Cast pot metal and crimp types are not acceptable.

C. Conduit bodies used with conduits 1 ½ inches and larger shall be galvanized cast iron “mogul conduit bodies” complete with a domed and angled cover, neoprene gasket, stainless steel screws, and rated for “wet locations”.

2.03 BUSHINGS AND LOCKNUTS

A. Use OZ/GEDNEY type 'B' insulated or type 'BLG' bushing where necessary to

bond conduit to ground connection. Bushings shall be as manufactured by OZ/GEDNEY, THOMAS & BETTS, or CROUSE-HINDS.

B. Locknuts shall be used on both sides of conduit connections to a box or a panelboard in addition to the bushing. Where a larger size opening occurs than the size of the conduit, use reducing locknuts. Do not use reducing washers.

2.04 WIRING TROUGHS

A. Wiring troughs complete with screwed covers shall be used where indicated and for mounting groups of switches and/or starters. Wiring troughs shall be the standard manufactured product of a company regularly producing wiring troughs and shall not be a local shop assembled unit. Wiring trough shall be UL listed and of sizes indicated or as required by NEC, if not indicated. The interior, including couplings shall be completely open without interference. Finish shall be ASA #49 medium light gray enamel over a rust inhibitor. Wiring troughs shall be UL listed "Suitable For Wet Locations" and so labeled where indicated "WP" on the Drawings.

B. Wiring connection taps within wiring troughs shall be made using clear self-sealing, self-insulating, multi-tap connectors with transparent flexible insulating covers. The connectors shall be securely fastened. The multi-tap connector shall be manufactured by ILSCO, Series “PCT” ClearTap or approved equal.

2.06 CABLE HOOK SUPPORT SYSTEMS

A. Cable hooks (also known as “J” hooks) shall be provided for low voltage cable systems as hereinafter specified in other sections of these specifications.

B. Cable hooks shall provide a flat bottom bearing surface of sufficient width to comply with required bend radii of high-performance cables.

C. Cable hooks shall have flare edges to prevent damage while installing cables.

D. Cable hooks shall be designed so the mounting hardware is recessed to prevent cable damage.

E. Cable hooks sized 1 5/16 inches and larger shall have a stainless steel cable latch retainer to provide containment of cables within the hook. The retainer shall be removable and reusable and be suitable for use in air handling spaces.

F. Cable hooks shall be factory assembled for direct attachment to walls, hanger rods, beam flanges, purlins, strut, floor posts, etc. to meet job conditions.

G. Multi-tiered cable hook assemblies shall be used where required to provide separate cabling compartments, or where additional capacity is needed. Assemblies may be factory assembled or assembled from pre-packaged kits.

Assemblies shall consist of a steel angled hanger bracket holding up to six (6) cable hooks.

H. Cable hooks for non-corrosive areas shall be pre-galvanized steel, ASTM A653. Where additional strength is required, cable hooks shall be spring steel with a zinc-plated finish, ASTM B633, SC3. Cable hooks for corrosive areas shall be stainless steel, AISI Type 304.

I. Cable hooks shall be capable of supporting a minimum of 30 pounds with a safety factor of 3. Spring steel cable hooks shall be capable of supporting a minimum of 100 pounds with a safety factor of 3 where extra strength is required.

J. Cable hook manufacturer shall be B-LINE SYSTEMS, INC. Series BCH21, BCH32, BCH64, or equal as manufactured by ERICO CADDY.

2.07 PULL-LINES (CORDAGE)

A. Pull-lines (rope and cordage) types and strengths must be selected and calculated by the Contractor. The selection must be based on the intended use and expected pulling load applications. Design Factor (DF) selections and Working Load Limits (WLL) must be calculated with consideration of exposures to risk and actual conditions of use for each application. Pull-lines shall be in compliance with the latest Cordage Institute Standards and Guidelines.

B. The minimum pull-line tensile strength for insertion into conduits shall be 500 pounds and of the low-friction type.

C. Each utility service entrance conduit (raceway) for power company, telephone company and/or cable television (CATV) company shall have a MULETAPE® pulling tape with numerical values having sequential footage (feet and inches) markings, without splices. The MULETAPE® shall have a minimum tensile strength of 2500 pounds and shall be of the low-friction type with prelubrication, high abrasion resistant yarns.

D. Where minimum pull-line strengths are given, they do not negate the Contractor's responsibility for proper selections and calculations for higher strength pull-lines to suit the application.

PART 3 - EXECUTION

3.01 CONDUITS

A. Panelboard feeders shall be run in electrical metallic tubing (EMT), galvanized rigid steel conduit, intermediate grade metal conduit, or plastic conduit as described herein.

B. Branch circuit raceways for motors twenty (20) horsepower (or tons) and larger, or a combination of motors totaling twenty (20) horsepower and larger requiring a single point connection shall be EMT, galvanized rigid steel conduit, intermediate grade metal conduit, or plastic conduit as described herein.

C. Branch circuit raceways for motors served by variable frequency drives (VFD) shall be electrical metallic tubing (EMT), galvanized rigid steel conduit, or intermediate grade metal conduit from the load side of the VFD to the line side of the motor. Do not use plastic conduit.

D. Feeders, branch circuits, fire alarm system wiring, and other low voltage systems wiring (required to be in conduit) installed indoors in dry locations shall be run in electrical metallic tubing (EMT), galvanized rigid steel conduit, or intermediate grade metal conduit above hung ceilings (accessible and non-accessible), in hollow block walls, in furred spaces, in vertical and horizontal pipe chases, and in exposed dry locations as describe herein and other sections of these specifications.

E. Feeders, branch circuits, fire alarm system wiring, and other low voltage systems wiring installed underground, under slab on grade, in concrete, in crawl spaces, or in wet locations shall be run in galvanized rigid steel conduit, intermediate grade metal conduit, or plastic conduit as described herein.

F. Low voltage systems plenum rated wiring or cables run indoors in dry locations shall be in electrical metallic tubing (EMT), galvanized rigid steel conduit, or intermediate grade metal conduit when run above non-accessible ceilings, in hollow block walls, and in exposed dry locations other than communications rooms or in a cable tray. Refer to the respective low voltage systems sections of the specifications for other conduit requirements.

G. Conduits run exposed in boiler rooms, elevator machine rooms, mechanical rooms, pump rooms, fire sprinkler service room, and all other similar spaces, located between the floor and a height of 10'-0" above the finished floor, shall be galvanized rigid steel conduit, or intermediate grade metal conduit as described herein. Conduits above 10'-0" may be EMT, unless otherwise indicated on the Drawings, or required by codes.

3.02 RACEWAY SYSTEM

A. Raceways shall be continuous from outlet to outlet; from outlet to cabinets, junction boxes, or pullboxes; and secured to all boxes so that each system is electrically continuous from service to outlets. Provide termination of raceways with double lock nuts and bushings.

B. Raceways shall be securely and rigidly supported to the building structure in a

neat and workmanlike manner, and wherever possible, parallel runs or horizontal conduit shall be grouped together on adjustable trapeze hangers. Raceways shall be supported independently from other disciplines (i.e. mechanical, sprinkler, etc). Support shall be provided at appropriate intervals not exceeding ten (10) feet with straps, hangers, and brackets specifically designed for the application. Channels shall be 1 inch for 24-inch wide trapeze and 1-1/2 inch for larger than 24 inch. Perforated steel straphangers or tie-wire supports are not acceptable. Conduits installed along wall surfaces shall be supported with galvanized steel brackets specifically designed for conduits and sized for the conduit used. Conduit brackets shall be fastened to the wall using appropriate anchors and screws, the use of drive pins and/or other methods using compressed air or gases are not acceptable. Raceways and supports shall not terminate or be fastened directly to the roof decking. Raceways under roof decking shall not be less than 1½ inches from the nearest surface of the roof decking. Supports attached to structural steel joists shall only be attached within 3" of the top of the joist panel points. Supports attached at the bottom or beyond 3" of the joist panel points must be approved, in writing, by the Structural Engineer of record and the Owner before attaching.

C. Run exposed raceways parallel with or at right angles to walls. In mechanical rooms and similar utilitarian spaces where exposed conduits are used, provide "condulets", and similar fittings in lieu of junction boxes. Exposed outlet boxes of adequate size, however, shall be used to contain wire junctions.

D. No raceway shall be installed within three (3) inches of hot water pipes, or appliances, except at crossings where raceway shall be at least one (1) inch from pipe cover.

E. Install raceway to prevent collection of trapped condensation and be devoid of traps. Slope underground raceways away from the building or provide weep holes when sloping away from the building is not possible.

F. Do not terminate in, or fasten raceways to, motor foundations.

G. Raceways installed outside underground shall have a minimum of twenty-four (24) inches top cover. Separate electric raceways from telephone (and other low voltage systems) raceways with a minimum of twelve (12) inches of well-tamped earth, or six (6) inches of concrete.

H. Joints in raceways in concrete or underground shall be watertight. Steel conduits shall have ends cut square. Ream smooth and paint male threads with graphite-base pipe compound and draw up tight with conduit couplings. Do not paint female threads; where required, use Erickson, or equal, conduit fittings. Running threads shall not be permitted. Place caps in ends of conduits as soon as located to prevent entry of foreign material. Screwed on caps shall be used for threaded conduits. Unused (abandoned) conduits shall be capped. The use of tape, paper or rag wads in not acceptable for conduit caps.

I. After conduit installation, clean and paint marred surfaces affecting galvanizing with asphaltum, galvanized-iron primer.

J. Run conduit above suspended ceilings for outlets in suspended ceilings. Keep clear of planned ductwork where turning down from slab into suspended ceiling.

K. Horizontal or cross runs in solid partitions and walls shall not be permitted.

L. Conduits designated on the Drawings as empty conduits (EC) shall have a properly sized pull-line.

M. Flexible metal conduit used for connection of luminaires (lighting fixtures), receptacles outlets, telepower poles, and as otherwise shown on the Drawings, shall be supported and bonded in accordance with NEC Article 348.

N. Conduit runs in under concrete slabs shall be installed only where shown on the Drawings or approved by the owner and shall be limited to 3/4-inch conduit. Conduit shall be run in the gravel under the slab not in the slab.

O. Where embedded conduits cross building expansion joints, the Contractor shall furnish and install an offset expansion joint or a sliding expansion joint. Sliding expansion joints shall be provided with bonding strap and clamp. Where conduits are exposed, provide expansion fittings or flexible conduit as required.

P. In all wet and damp locations, boiler rooms, elevator machine rooms, kitchens, mechanical rooms, pump rooms, fire sprinkler service room, and all other similar spaces, all final electrical connections to any and all equipment, regardless of the type, shall consist of conductors run in polyvinyl sheathed flexible metal conduit ("Sealtite") with maximum lengths as hereinbefore specified.

Q. Conduits/raceways shall not be permitted to be run exposed on top of finished floors or grade, unless specifically shown on the drawings or approved by the Owner in advance.

R. Raceways or sleeves known to be subjected to different temperatures and where condensation is known to be a problem, as in cold storage areas of (or in) the building or where passing from the interior to the exterior of the building, the raceway or sleeve shall be filled with an approved material to prevent the circulation of warm air to a cold section of the raceway or sleeve, per NEC 300.7.

3.04 CABLE HOOK SUPPORT SYSTEM

A. Installation and configurations shall conform to the requirements of the current revision levels of ANSI/EIA/TIA Standards 568 & 569, NEC, the manufacturer's installation instructions and other sections of these project specifications.

B. Cable hook assemblies shall be supported from the building structure. Where fastened to walls use appropriate anchors and screws, the use of drive pins

and/or other methods using compressed air or gases are not acceptable. Supports shall not terminate or be fastened directly to the roof decking Cables installed under roof decking shall not be less than 1½ inches from the nearest surface of the roof. Cable hook supports attached to structural steel joists shall only be attached within 3" of the top of the joist panel points. Supports attached at the bottom or beyond 3" of the joist panel points must be approved, in writing, by the Structural Engineer of record and the Owner before attaching.

C. Install cables using techniques, practices, and methods that are consistent with Category 5 cables or higher requirements and that support Category 5 or higher performance of completed and linked signal paths, end to end.

D. Install cables without damaging conductors, shield, or jacket.

E. Do not bend cables, in handling or in installing, to smaller radii than minimums recommended by cable manufacturers.

F. Do not exceed load ratings and allowable fill capacity specified by the cable hook manufacturer.

G. Install cable hooks to maintain a minimum three (3) inch clear or higher vertical space above the accessible ceiling tiles for the horizontal cabling and pathway.

3.05 CUTTING AND HOLES

A. Locate holes in advance where they are proposed in structural sections such as ribs or beams. Prior to drilling through any structural section or member, obtain the written approval of the Architect/Structural Engineer of Record and the Owner.

B. Cut holes through concrete and masonry structures with a diamond core drill or concrete saw. Pneumatic hammer, impact electric, hand or manual hammer type drills are not allowed, except where permitted in advance by the Architect/Engineer and Owner, do to limited working space.

C. Openings in floor slabs or fire-rated walls or partitions for raceways and other electrical equipment shall, after installation of the raceway, be fire stopped using a product similar to THOMAS & BETTS "Flame-Safe" fire retardant.

END OF SECTION

SECTION 16120

WIRE, CABLE, AND CONNECTORS

PART 1 - GENERAL

1.01 REQUIREMENTS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 SCOPE

A. The work covered under this Section shall include furnishing and installing wire, metal-clad cable, two hour fire rated conduit cable, and connectors for all power wiring systems as shown on the Drawings and herein specified.

B. Wiring for data, communication, electronic, fire alarm, or other low voltage and special systems shall be provided as specified in the appropriate specialty Section of these Specifications.

1.03 QUALITY ASSURANCE

A. All equipment, materials, and their installation shall conform to the requirements of the National Electrical Code (NEC), local code requirements, and these Specifications.

B. All equipment and materials shall be listed by Underwriters Laboratories, Inc. (UL) for their intended use and shall bear the UL label.

C. Equipment shall be constructed in accordance with National Electrical Manufacturer's Association (NEMA) standards.

D. Submittals are required in accordance with SECTION 16010 of these Specifications.

1. Submittals shall include a preliminary schedule to perform the infrared scans described in Part 3 of this specification. The schedule shall be based on the contractual substantial completion date for this project.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. All conductors shall be new soft drawn high conductivity copper and shall be delivered to the site in their original unbroken packages plainly marked as follows:

1. UL Label.

2. Size, type and insulation rating of the wire marked every four (4) feet along the length.

3. Name of the manufacturing company and the trade name of the wire.

B. All conductors shall have 600 volt insulation, unless specified otherwise. The minimum operating temperature of the conductor's insulation shall be 75° C.

C. Where conductors are installed in a raceway, in dry and damp locations, conductor insulation shall be rated 75° C. Type THWN or dual rated THWN/THHN.

D. Where conductors are installed in a raceway, exposed to excessive temperatures, conductor insulation shall be rated 90° C. Type THHN, THWN/THHN (dual rated), XHHW or XHHW-2.

E. Where conductors are installed in a raceway, in wet locations, conductor insulation shall be rated 75° C. Type XHHW (wet locations), or XHHW-2 rated 90° C. (dry and wet locations) as appropriate.

F. Conductors on the secondary side of variable frequency drives (VFD) shall be Type XHHW or XHHW-2 as appropriate.

G. The minimum conductor size shall be No. 12 AWG, except for control wiring (minimum size shall be No. 14 AWG), and as stated in other Sections of these Specifications, or as shown on the Drawings. Conductors for 120/277 volt control signals shall not be considered as control wiring.

H. Branch circuits for emergency lighting, including illuminated exit signs, shall be a minimum of No. 10 AWG.

I. Conductors smaller than No. 8 shall be solid; No. 8 and larger shall be stranded.

J. All conductors throughout the project shall be color coded to identify phases, neutral, and ground. Color-coding shall be as follows:

	SYSTEM VOLTAGE	
CONDUCTORS	120/208	277/480
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray

Ground	Green	Green

K. Insulated conductors size No. 6 A.W.G. and smaller shall have the insulation color-code identification factory applied for the entire length of the conductor. On larger sizes, provide color-coded phasing tape at each box and connection. White or gray colored insulation shall only be used for grounded (neutral) conductors. For multiple neutrals run in the same conduit, provide separate neutral conductors with a continuous, factory applied tracer stripe matching the color of the respective phase conductor. Green colored insulation shall only be used for equipment grounding conductors.

L. Where conductor size is not indicated, its current carrying capacity shall be equal to or greater than the rating of its overcurrent protective device.

M. Where conductor sizes are increased for voltage drop or other reasons the equipment grounding conductor (when provided) shall be increased in size proportionately.

N. Where conductor sizes are increased for voltage drop they may be reduced in size within ten feet of the termination in order to fit under the lugs available on the overcurrent protective device but not less than the ampacity of the frame size of the overcurrent protective device.

PART 3 - EXECUTION

3.01 IDENTIFICATION OF CONDUCTORS

A. All branch circuits, including grounded (neutral) conductors, shall be tagged in the panelboards, in all gutters, and in all junction boxes where circuits terminate for the purpose of identifying the various circuits.

B. Feeders and mains shall be tagged in the distribution switchboards, panelboards, and within junction and pull boxes.

C. The method of tagging shall be with an adhesive type of marker. Tagging shall clearly distinguish between 120/208 volt and 277/480 volt conductors.

D. Tags shall be applied after wire is installed in conduit.

E. Where it is impractical to use printed markers on certain wires or cables, use blank type with identification marked thereon in indelible pencil.

3.02 INSTALLATION

A. Conduit/raceway system shall be complete prior to pulling in wires.

B. Any run of conduit/raceway which does not permit conductors to be pulled in readily shall be condemned and replaced to the satisfaction of the Architect/Engineer and Owner.

C. Conductors shall be continuous between outlets or junction boxes and no splices shall be made except in outlet boxes, junction boxes, and handholes.

D. Do not combine systems of various voltages or circuits from separate sources in the same raceway or conduit system, regardless of the voltage rating of the conductors, unless otherwise shown on the Drawings.

E. All joints, splices and taps for conductor sizes No. 10 and smaller (including luminaire pigtails) shall be connected with approved type crimp connectors, or spring type screw-on connectors (wire-nuts) with insulating skirts; No. 8 and larger shall be connected with solderless THOMAS & BETTS high pressure connectors with heat shrink insulation that possess equivalent or better mechanical strength and insulation ratings than that of the unspliced conductor. Refer to Specification Section 16110 for splices and taps within wiring troughs. The use of pressure connectors is **not** acceptable.

F. Oil, grease or silicon, which could damage the insulation of the conductors or cables, shall not be used when pulling conductors. Use only UL approved cable lubricants approved for the purpose.

G. Train conductors neatly in panelboards, cabinets, and other electrical equipment. Installed conductors shall allow for a minimum of one (1) future re-termination.

H. Tighten pressure type lugs on switchboards, panelboards, motors and other equipment to the manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and 486B.

I. Conductors in vertical conduit runs shall be supported with split-wedge type fittings that clamp each conductor and tighten under the weight of the conductors at intervals required by the NEC.

J. All wiring within the building structure, crawlspaces, and slabs shall be installed in conduit unless indicated or specified otherwise.

K. Homeruns longer than seventy five (75) feet from a 120/208 volt panelboard or one hundred seventy five (175) feet from a 277/480 volt panelboard shall be not less than No. 10 AWG, copper.

L. No more than three (3) current carrying phase conductors shall be installed in any one conduit, unless explicitly shown on the drawings.

M. Connect circuits and feeders as shown on the Drawings. Drawings are

diagrammatic and do not show every detail required in the wiring system.

N. Install wiring so conductors are not in tension in completed systems.

O. All conductors making up parallel feeders shall be the same size, same type, same insulation and all cut the same length. Bond each group of conductors making up a phase or neutral at both ends in an approved manner. Parallel conductors shall not be run in the same raceway.

P. Provide a separate neutral and grounding conductor (or conduit ground) for all GFI circuits or GFI devices to ensure an adequate ground-fault path.

Q. Branch circuits requiring a neutral conductor shall have one neutral conductor per phase conductor when installed in a common raceway, unless specifically shown otherwise on the Drawings.

R. Conductors or cables installed in conduit or tubing exposed to direct sunlight on rooftops require temperature adjustment factors in accordance with the values in NEC 2008 Table 310.15(B)(2)(c).

3.04 FIELD QUALITY CONTROL

A. After installing conductors and cables and before electrical circuitry has been energized, perform the following visual and mechanical inspections:

1. Verify cables and conductors comply with the contract documents.

2. Verify cables and conductors are braced for short circuit stresses where specified.

3. Verify cables and conductors are correctly identified at each termination, splice and tap where applicable.

4. Verify correct phase rotation is maintained throughout project.

5. Verify color coding and identification complies with specifications and the National Electrical Code.

6. Inspect all exposed sections of cables and conductors for physical damage and correct connection.

7. Inspect all bolted and compression connections.

B. Verify phase identification is A, B, C, left to right, front to back and top to bottom. If corrections are required change feeder and branch circuit identification at each end of circuit so that correct phase identification is maintained throughout the project. If incorrect identification is noted on existing systems notify the

Architect/Engineer and Owner for action to be taken.

C. Infrared Scanning: After Substantial Completion, but not more than sixty (60) days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger and a complete infrared scan of each panel board, switchboard, and lug terminations of each chiller and motor terminations 20 HP and larger. Remove box and equipment covers so splices and lugs are accessible to portable scanner.

1. Perform a follow-up infrared scan for all splices and terminations previously described approximately eleven (11) months after date of Substantial Completion, but must be during normal school (business) operating hours.

2. Contractor shall submit to the Architect/Engineer and Owner, at time of final inspection, a schedule to perform the infrared scans during normal school (business) operating hours while the building is in full operation, under load. Re-terminations requiring any power shut-downs must be coordinated with the Owner and performed during non-school (business) hours.

3. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

4. Record of Infrared Scanning: Prepare a certified report that identifies equipment and splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken and observations after remedial action.

D. Remove and replace malfunctioning units then verify, inspect and retest as specified above.

END OF SECTION

SECTION 16150

JUNCTION AND PULL BOXES

PART I - GENERAL

1.01 REQUIREMENTS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 SCOPE

A. The work covered under this Section shall include furnishing and installing junction and pull boxes complete for all electrical systems as shown on the Drawings and herein specified.

1.03 QUALITY ASSURANCE

A. All equipment, material, and their installation shall conform to the requirements of the National Electrical Code (NEC), local code requirements, and these Specifications.

B. All equipment and materials shall be listed by Underwriters Laboratories, Inc. (UL) for their intended use and shall bear the UL label.

C. Equipment shall be constructed in accordance with National Electrical Manufacturer's Association (NEMA) standards.

D. Submittals are required in accordance with SECTION 16010 of these specifications.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. Junction and pull boxes shall be provided where indicated and required and shall be of the type and size for the installation of the electrical system. Junction or pull boxes not over one hundred (100) cubic inches in volume shall be constructed in accordance with the requirements of NEC. All junction boxes shall have removable screwed covers and be accessible after completion of the building. Removable covers shall not exceed three (3) feet in size in any direction and split covers shall be used for boxes larger than three (3) feet in any direction. Where several feeders pass through a common pull box, the feeders shall be tagged to indicate clearly their electrical characteristics and branch circuit numbers and panelboard designation. This same information shall be stenciled in paint on the cover of each box.

B. Pull and junction boxes shall be made of code gauge galvanized sheet steel with removable screw covers. Minimum size shall be 4 inch x 4 inch x 2-1/8 inches deep.

C. Cast metal pull boxes shall be provided in damp or wet locations, with a gasketed screwed cover, and drilled and tapped holes as required. Screws shall be brass or bronze.

D. Pull boxes shall be provided in any conduit run which exceeds one hundred (100) feet in length, or any run having more than two hundred seventy (270) total degrees of bend.

2.02 UNDERGROUND BOXES AND ENCLOSURES

A. Underground boxes, enclosures and covers shall conform to all test provisions of the most current ANSI/SCTE 77 "Specifications For Underground Enclosure Integrity" for Tier 15 applications. When multiple tiers are specified the boxes must physically accommodate and structurally support compatible covers while possessing the highest Tier rating. In no assembly can the cover design load exceed the design load of the box. All components in an assembly (box and cover) shall be manufactured using matched surface tooling. All covers are required to have a minimum coefficient of friction of 0.05 in accordance with ASTM C1028 and the corresponding Tier level embossed on the top surface. Assemblies not U.L. Listed shall have independent third party verification or test reports stamped by a registered Professional Engineer certifying that all test provisions of this specification have been met are required with each submittal.

B. Underground boxes, enclosures and covers shall be as manufactured by QUAZITE or approved equal.

4. Other applications requiring the use of exterior underground boxes or enclosures shall use QUATIZE "PG" Series enclosure boxes appropriately sized complete with the proper cover with logo designating the use of the box or enclosure.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Pull and junction boxes shall be installed where indicated on the Drawings or as herein specified. Boxes shall be located so as to be inaccessible to the general public.

B. All boxes and conductors therein shall be marked as hereinbefore specified to indicate the voltage and circuit numbers.

C. Boxes shall not be fastened in place with drive pins and/or other methods using compressed air or gases.

D. Boxes located under roof decking shall not be less than 1½ inches from the nearest surface of the roof decking.

E. Pull and junction boxes shall be concealed except in electrical and mechanical equipment rooms, spaces architecturally designed to have an open structure without ceilings or as otherwise indicated on the Drawings.

F. All system pull and junction box covers shall be painted as follows:

1.	120/208 Volt	- Black
2.	277/480 Volt	- Orange
3.	Emergency	- White
4.	Fire Alarm	- Red
5.	Security System	- Gray

3.02 UNDERGROUND BOXES AND ENCLOSURES

A. Exterior underground boxes and enclosures shall be installed per manufacturer's recommendations and the following minimum requirements:

1. After the proper location of the underground enclosure has been established and the conduits, underground cables or ground rods, etc. are installed or located, the hole for the enclosure shall be excavated and shall be at least six (6) to eight (8) inches deeper that the depth of the enclosure and shall have a minimum of six (6) inches of gravel in the bottom of the hole or as shown on the Drawings. The gravel base shall extend past the side walls of the enclosure by at least four (4) to six (6) inches. Once the enclosure is positioned on top of the gravel base and the elevation check, the enclosure shall be back-filled.

2. Back-filling shall have 95% compaction or greater.

3. Provide internal bracing during back-filling to ensure minimal box sidewall deflections. Bracing supports shall be 2x4's or similar material sized to hold the box at mid-depth.

4. Top of the box and cover shall be flush with the finished grade.

3.03 CONDUCTORS

A. All conductors entering junction and pull boxes shall be of the same voltage. Do not mix voltages regardless of the conductors' voltage rating, unless specifically shown on the Drawings.

B. Branch circuit conductors and feeder conductors shall not occupy the same junction or pull box. Maintain separate boxes for branch circuits and separate boxes for feeders, unless specifically shown otherwise on the drawings.

3.04 ARC-PROOFING

A. All feeders entering a pull box containing more than one (1) feeder, or more than one (1) parallel feeder, shall be arc-proofed as follows. Conductors of the same feeder, including each set of a parallel feeder, shall be tightly grouped together and held in place with random wrapped 3M No. 33 Tape. Grouped cables shall be arc proofed using spirally wound one half-lapped layer of 3M No. 77 Fire and Arc-Proofed Tape which shall be held in place with random wrapped 3M No. 69 Glass Cloth Electrical Tape.

END OF SECTION

SECTION 16213

STANDBY ELECTRICAL POWER SYSTEM (EMERGENCY SHELTER SYSTEM)

PART 1 - GENERAL

1.01 REQUIREMENTS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 SCOPE

A. The work covered under this Section shall include furnishing and installing a standby electrical power system as shown on the drawings and specified herein.

1. Provide complete factory assembled generator set equipment with digital (microprocessor-based) electronic generator set controls, digital governor, digital voltage regulator, and remote annunciator panel.

2. Provide complete factory assembled power transfer equipment with field programmable digital electronic controls designed for fully automatic operation and including: surge voltage isolation, voltage sensors on all phases of both sources, linear operator, permanently attached manual handles, positive mechanical and electrical interlocking, and mechanically held contacts for both sources.

3. Provide generator-base fuel oil tank (UL 2085).

4. Provide a complete fuel oil transfer pumping system.

5. Provide factory test, startup by a supplier authorized by the equipment manufacturer(s), and on-site testing of the system.

6. The generator set manufacturer shall warrant all equipment provided under this section, whether or not it is manufactured by the generator set manufacturer, so that there is one source for warranty and product service. Technicians specifically trained and certified by the manufacturer to support the product and employed by the generator set supplier shall service the generator sets.

B. The standby "emergency" electrical power system for life safety is a separate system and not apart of this standby electrical power system.

1.03 QUALITY ASSURANCE

A. The manufacturer of the generator set shall maintain service parts inventory at a

central location which is accessible to the service location 24 hours per day, 365 days per year.

B. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

C. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of critical replacement parts at the local service organization, and in service vehicles. The service organization shall be on call 24 hours per day, 365 days per year, who has had parts and service facilities available locally (within a 50 mile radius of the job site) for the last five (5) years.

D. Submittals are required in accordance with SECTION 16010 of the Specifications, which shall include the following minimum information for review:

1. Manufacturer's product literature and performance data, sufficient to verify compliance to specification requirements.

2. Manufacturer's certification of prototype testing.

3. Manufacturer's published warranty documents.

4. Shop drawings showing plan and elevation views with certified overall dimensions, as well as wiring interconnection details.

5. Interconnection wiring diagrams showing all external connections required; with field wiring terminals marked in a consistent point-to-point manner.

6. Manufacturer's installation instructions.

E. Factory Testing:

1. The generator set manufacturer shall perform a complete operational test on the generator set prior to shipping from the factory. A certified test report shall be provided. Equipment supplied shall be fully tested at the factory for function and performance.

2. Generator set factory tests on the equipment shall be performed at rated load and rated power factor. Generator sets that have not been factory tested at rated power factor will not be acceptable. Tests shall include: run at full load, maximum power, voltage regulation, transient and steady-state governing, single step load pickup, and function of safety shutdowns.

3. The automatic transfer switch manufacturer shall perform a complete

operational test on the transfer switch prior to shipping from the factory. A certified test report shall be available on request. Test process shall include calibration of voltage sensors.

1.04 CODES AND STANDARDS

A. The generator set installation and on-site testing shall conform to the requirements of the following codes and standards, as applicable. The generator set shall include necessary features to meet the requirements of these standards:

1. CSA 282, 1989 Emergency Electrical Power Supply for Buildings

2. IEEE446-Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.

3. NFPA 37

4. NFPA 70 – National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701 and 702.

5. NFPA 99 – Essential Electrical Systems for Health Care Facilities

6. NFPA 110 – Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit, component level type tests will not substitute for this requirement.

B. The generator set and supplied accessories shall meet the requirements of the following standards, as applicable:

1. NEMA MG1. Alternator shall comply with the requirements of the current version this standard as they apply to AC alternators.

2. UL142 – Sub base tanks.

3. UL2085 – Sub-base tanks.

4. UL1236 – Battery Chargers.

5. UL2200. The generator set shall be listed to UL2200 or submit to an independent third party certification process to verify compliance as installed.

C. The control system for the generator set shall comply with the following requirements, as applicable:

1. CSA C22.2, No. 14 – M91 Industrial Control Equipment.

2. EN50082-2, Electromagnetic Compatibility – Generic Immunity Requirements, Part 2: Industrial.

3. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.

4. FCC Part 15, Subpart B.

5. IEC8528 part 4. Control Systems for Generator Sets.

6. IEC STD 801.2, 801.3, and 801.5 for susceptibility, conducted, and radiated electromagnetic emissions.

7. UL508. The entire control system of the generator set shall be UL508 listed and labeled.

8. UL1236. Battery chargers.

D. The automatic transfer switch(es) installation and application shall conform to the requirements of the following codes and standards:

1. CSA 282, Emergency Electrical Power Supply for Buildings
2. NFPA70 – National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
3. NFPA99 – Essential Electrical Systems for Health Care Facilities
4. NFPA110 – Emergency and Standby Power Systems. The transfer switch shall meet all requirements for Level 1 systems.
5. IEEE446 – Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
6. NEMA ICS10-1993 – AC Automatic Transfer Switches.

E. The transfer switch assembly shall comply with the following standards:

1. CSA C22.2, No. 14 – M91 Industrial Control Equipment.
2. EN55011, Class B Radiated Emissions
3. EN55011, Class B Conducted Emissions
4. IEC 1000-4-5 (EN 61000-4-5); AC Surge Immunity.
5. IEC 1000-4-4 (EN 61000-4-4) Fast Transients Immunity
6. IEC 1000-4-2 (EN 61000-4-2) Electrostatic Discharge Immunity
7. IEC 1000-4-3 (EN 61000-4-3) Radiated Field Immunity

8. IEC 1000-4-6 Conducted Field Immunity
9. IEC 1000-4-11 Voltage Dip Immunity.
10. IEEE 62.41, AC Voltage Surge Immunity.
11. IEEE 62.45, AC Voltage Surge.
12. UL1008 – Transfer Switches. Transfer switches shall be UL1008 listed. UL1008 transfer switches may be supplied in UL891 enclosures if necessary to meet the physical requirements of the project.

F. The generator set manufacturer and the automatic transfer switch manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

1.05 ACCEPTABLE MANUFACTURERS

A. Generator set equipment specifications for this project are based on microprocessor-based generator sets manufactured by CUMMINS POWER GENERATION. Equipment by CATERPILLAR or KOHLER POWER SYSTEMS that meets the requirements of this specification shall be acceptable.

B. Automatic transfer switch equipment specifications for this project are based on microprocessor-based transfer switches manufactured by CUMMINS POWER GENERATION Model OTPC or equal as manufactured by AUTOMATIC SWITCH COMPANY (ASCO) Model 7000 Series.

C. The Cummins Power Generation transfer switches shall be provided with the Cummins Power Generation generator set and the ASCO transfer switches shall be provided with the Caterpillar generator set, to ensure there is one source for warranty and product service.

PART 2 – PRODUCTS

2.01 GENERATOR SET

A. Ratings
1. The generator set shall operate at 1800 rpm and at a voltage of: 277/480 Volts AC, Three phase, Four wire, 60 hertz.

2. The generator set shall be rated at 250 kW, 312 kVA at 0.8 PF, standby rating, Model D250, based on site conditions of: Altitude 1000 ft, ambient temperatures up to 104 degrees F.

3. The generator set rating shall be based on emergency/standby service.

B. Performance

1. Voltage regulation shall be plus or minus 0.5 percent for any constant load between no load and rated load for both parallel and non-parallel applications. Random voltage variation with any steady load from no load to full load shall not exceed plus or minus 0.5 percent.

2. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.5%.

3. The diesel engine-generator set shall be capable of single step load pick up of 100% nameplate kW and power factor, less applicable derating factors, with the engine-generator set at operating temperature.

4. Motor starting capability shall be a minimum of 567 skVA. The generator set shall be capable of recovering to a minimum of 90% of rated no load voltage with the application of the specified kVA load at near zero power factor applied to the generator set. Maximum voltage dip on application of this load, considering both alternator performance and engine speed changes shall not exceed 25%.

5. The alternator shall produce a clean AC voltage waveform, with not more than 5% total harmonic distortion at full linear load, when measured from line to neutral, and with not more than 3% in any single harmonic, and no 3rd order harmonics or their multiples. Telephone influence factor shall be less than 40.

   a. The generator set shall be certified by the engine manufacturer to be suitable for use at the installed location and rating, and shall meet all applicable exhaust emission requirements at the time of commissioning.

C. Construction:

1. The engine-generator set shall be mounted on a heavy-duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within the rails.

2. All switches, lamps, and meters in the control system shall be oil-tight and dust-tight. There shall be no exposed points in the control (with the door open) that operate in excess of 50 volts.

D. Connections.

1. The generator set load connections shall be composed of silver or tin

plated copper bus bars, drilled to accept mechanical or compression terminations of the number and type as shown on the Drawings.

2. Sufficient lug space shall be provided for use with cables of the number and size as shown on the Drawings.

3. Power connections to auxiliary devices shall be made at the devices, with required protection located at a wall-mounted common distribution panel.

4. Generator set control interfaces to other system components shall be made on a common, permanently labeled terminal block assembly. Labels describing point functions shall be provided.

2.02 ENGINE AND ENGINE EQUIPMENT

A. The engine shall be diesel, 4 cycle, radiator and fan cooled. Engine shall be EPA, Tier-**3** certified. Minimum displacement shall be 538 cubic inches. The horsepower rating of the engine at its minimum tolerance level shall be sufficient to drive the alternator and all connected accessories. Two cycle engines are not acceptable. Engine accessories and features shall include:

1. An electronic governor system shall provide automatic isochronous frequency regulation. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate and excitation as appropriate to the state of the generator set. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed and accelerating to rated speed. The governing system shall include a programmable warm up at idle and cool down at idle function. While operating in idle state, the control system shall disable the alternator excitation system.

2. Skid-mounted radiator and cooling system rated for full load operation in 122 degrees F (50 degrees C) ambient as measured at the generator air inlet. Radiator fan shall be suitable for use in a system with 0.5 in H_2O restriction. Radiator shall be sized based on a core temperature which is 20˚F higher than the rated operation temperature, or prototype tested to verify cooling performance of the engine/radiator/fan operation in a controlled environment. Radiator shall be provided with a duct adapter flange. The cooling system shall be filled with a 50/50-ethylene glycol/water mixture prior to shipping by the equipment manufacturer. Rotating parts shall be guarded against accidental contact.

3. Electric starter(s) capable of three complete cranking cycles without overheating.

4. Positive displacement, mechanical, full pressure, lubrication oil pump.

5. Full flow lubrication oil filters with replaceable spin-on canister elements and dipstick oil level indicator.

6. An engine driven, mechanical, positive displacement fuel pump. Fuel filter with replaceable spin-on canister element. Fuel cooler, suitable for operation of the generator set at full rated load in the ambient temperature specified shall be provided if required for operation due to the design of the engine and the installation.

7. Replaceable dry element air cleaner with restriction indicator.

   a. Flexible supply and return fuel lines.

   b. Engine mounted battery charging alternator, 40-ampere minimum, and solid-state voltage regulator.

   c. Coolant heater.

      i. Engine mounted, thermostatically controlled, coolant heater(s) for each engine. Heater voltage shall be as shown on the project drawings. The coolant heater shall be UL499 listed and labeled.

      ii. The coolant heater shall be installed on the engine with high temperature silicone hose connections. Steel tubing shall be used for connections into the engine coolant system wherever the length of pipe run exceeds 12 inches. The coolant heater installation shall be specifically designed to provide proper venting of the system. The coolant heaters shall be installed using quick disconnect couplers with provisions to isolate the heater for replacement of the heater element. The quick disconnect/automatic sealing couplers shall allow the heater element to be replaced without draining the engine cooling system or significant coolant loss.

      iii. The coolant heater shall be provided with a DC thermostat, installed at the engine thermostat housing. An AC power connection box shall be provided for a single AC power connection to the coolant heater system.

      iv. The coolant heater(s) shall be sized as recommended by the engine manufacturer to warm the engine to a minimum of 104˚F (40˚C) in a 40˚F (4˚C) ambient, in compliance with NFPA110 requirements, or the temperature required for starting and load pickup requirements of this specification.

v. Provide vibration isolators, spring/pad type, quantity as recommended by the generator set manufacturer. Isolators shall include seismic restraints if required by site location.

vi. Starting and Control Batteries shall be calcium/lead antimony type, 24 volt DC, sized as recommended by the engine manufacturer, complete with battery cables and connectors. The batteries shall be capable of a minimum of three (3) complete 15-second cranking cycles at 40˚F ambient temperature when fully charged.

B. Provide exhaust silencer(s) for each engine of size and type as recommended by the generator set manufacturer and approved by the engine manufacturer. The exhaust silencer (muffler) shall be critical grade. Exhaust system shall be installed inside the generator set enclosure.

C. Provide a minimum 12 amp battery charger for each generator set battery bank. Generator sets incorporating two battery banks shall be provided with two charger sets connected together and operated in parallel, with alarm outputs connected in parallel. The chargers shall include the following capabilities:

1. Chargers shall be UL 1236-BBHH listed and CSA or CUL certified for use in emergency applications.

2. The charger shall be compliant with UL 991 requirements for vibration resistance.

3. The charger shall comply with the requirements of EN61000-4-5 for voltage surge resistance; EN50082-2 for immunity; EN61000-4-2 for ESD; EN-61000-4-3 for radiated immunity; ANSI/IEEE C62.41 category B and IN61000-4-4 for electrically fast transient; EN61000-4-6 for conducted emissions; and FCC Part 15 Class A for radiated emissions.

4. The charger shall be capable of charging a fully discharged battery without damage to the charger. It shall be capable of returning a fully discharged battery to fully charged condition within 24 hours. The charger shall be UL-labeled with the maximum battery amp-hour rating that can be recharged within 24 hours. The label shall indicate that the charger is suitable for charging of 220AH batteries per NFPA requirements.

5. The charger shall incorporate a 4-state charging algorithm, to provide trickle charge rate to restore fully discharged batteries, a bulk charge rate to provide fastest possible recharge after normal discharge, an absorption state to return the battery to 100 percent of charge, and a float stage to maintain a fully charged battery and supply battery loads when the

generator set is not operating. In addition, the charger shall include an equalization timer. Charge rates shall be temperature compensated based on the temperature directly sensed at the battery.

6. The DC output voltage regulation shall be within plus or minus 1%. The DC output ripple current shall not exceed 1 amp at rated output current level.

7. The charger shall include the following features:

   a. Two line alphanumeric display with programming keys to allow display of DC output ammeter and voltmeters (5% accuracy or better), display alarm messages, and perform programming;

   b. LED indicating lamp(s) to indicate normal charging condition (green), equalize charge state (amber), and fault condition (red);

      i. AC input overcurrent, over voltage, and undervoltage protection;

      ii. DC output overcurrent protection;

      iii. Alarm output relay;

      iv. Corrosion resistant aluminum enclosure.

2.03 GENERATOR – BASE FUEL TANK

A. Provide a dual wall sub-base fuel storage tank with 1000 gallons capacity. The tank shall be constructed of corrosion resistant steel and shall be UL listed. The equipment, as installed, shall meet all local and regional requirements for above ground tanks.

B. Certifications

1. Underwriters Laboratories (UL) 2085 Special-Purpose Flammable-Liquid Protected Secondary-Containment Generator-Base Tank Listing

2. The tank must have been tested by UL for:

   a. Fire – Not to exceed 260˚ in UL Full-Scale Fire Test

   b. Projectile Resistant – UL Section 21

   c. Vehicle Impact Resistant – UL Section 20

3. The internal and external tank shall be constructed in accordance with UL

142.

4. The tank shall have an identifying UL Nameplate attached with the following:

   a. "Special Purpose Flammable Liquid Tank Protected Secondary Containment Generator Base Tank UL 2085"

   b. Tank serial number

   c. "This tank is Intended For Installation In Accordance With NFPA 30, NFPA 30A or NFPA 31, NFPA 37, NFPA 110"

   d. Manufacturer's name, location and telephone number

   e. Date of manufacture

   f. Model number of tank

   g. Primary Tank Capacity in Gallons (1000 gallons)

   h. Containment Percentage

   i. "Tank Requires Emergency Relief Venting, Capacity Not Less Than ____ Cubic Feet Per Hour, PRIMARY TANK and ___ Cubic Feet Per Hour ANNULAR SPACE".

   j. "Maximum Generator Weight ____".

   k. "Tank Is Intended for Stationary Installation Only. Tank shall be inspected to determine suitability after fire exposure".

   l. "For Diesel Fuel Only"

   m. "Pressurize Primary Tank When Pressure Testing Annular Space. Follow Installation Instructions".

C. Insulation

1. The internal steel tank shall be encased in 6" of LIGHTWEIGHT INSULATING CONCRETE; which is capable of preventing the internal tank temperature from rising not more than 260˚.

2. The insulation shall not contain any aggregates that may act as heat sinks.

3. The insulation shall be a monolithic (seamless) pour and contain no cold

joints or multiple concrete sections.

D. Painting

1. Sand blast tank to commercial sandblast standard.

2. Prime coat with Industrial Primer.

3. The entire exterior finish coating shall be petroleum-resistant two-part white.

4. Bottom of tank to be coated with coal-tar epoxy.

E. Construction

1. The internal tank shall be rectangular in shape, listed and constructed in accordance with UL 142 Standard for Generator-Base Tanks.

2. The inner and outer steel tank shall be constructed of minimum 3/16" thick, A-36 Hot Rolled Steel.

3. The tank shall meet seismic zone standards and provide the capability to be anchored as required by local codes for earthquake and/or flood.

4. The internal tank shall be pressure tested and pass a test of 5 psi at the factory.

5. The tank shall be designed with over-spill containment and shall have a 2" interstitial test monitoring pipe.

6. The tank shall include atmospheric and emergency venting nozzles sized to UL requirements.

7. The tank shall have signs to include: Labels to meet applicable codes, product content, and tank capacity. Each nozzle on Flammable, No Smoking, the tank shall be identified for its intended use.

8. The tank shall be designed to meet weight loads of the engine generator set.

9. The tank shall be designed with earthquake, hurricane, and flood tie-down points.

10. Leak detection provisions shall be provided and wired to the generator set control for local and remote alarm indicators.

11. Tank shall be equipped with multiple float switches for high and low fuel

levels alarms, activation of fuel oil transfer pumps and for any other requirements of the engine generator set manufacturer and as shown on the drawings. Switches shall be wired to the generator control for local and remote indications.

12. The fuel fill opening shall be recessed in the enclosure wall with a lockable door near the high fuel alarm box.

13. Conduit stub-up sleeves shall be provided for generator set load and control wiring and cabling. Spare couplings shall be provided in tank and rupture basin for customer use. External to the base main rail beams shall be two grounding bosses, one each end opposite corners, for customer grounding requirements.

F. Tank supplier shall also provide suitable steps and a man-way platform to provide complete maintenance access to the generator set and enclosure. The platform and stairs shall be constructed of galvanized steel. The platform and stairs shall be minimum 3'-0" in width.

2.04 AC GENERATOR

A. The AC generator shall be; synchronous, four pole, 2/3 pitch, revolving field, drip-proof construction, single prelubricated sealed bearing, air cooled by a direct drive centrifugal blower fan, and directly connected to the engine with flexible drive disc. All insulation system components shall meet NEMA MG1 temperature limits for Class H insulation system and shall be UL1446 listed. Actual temperature rise measured by resistance method at full load shall not exceed 105 degrees Centigrade.

B. The generator shall be capable of delivering rated output (kVA) at rated frequency and power factor, at any voltage not more than 5 percent above or below rated voltage.

C. A permanent magnet generator (PMG) shall be included to provide a reliable source of excitation power for optimum motor starting and short circuit performance. The PMG and controls shall be capable of sustaining and regulating current supplied to a single phase or three phase fault at approximately 300% of rated current for not more than 10 seconds.

D. The sub transient reactance of the alternator shall not exceed 15 percent, based on the standby rating of the generator set.

2.05 GENERATOR SET CONTROL

A. The generator set shall be provided with a microprocessor-based control system that is designed to provide automatic starting, monitoring, and control functions for the generator set. The control system shall also be designed to allow local

monitoring and control of the generator set, and remote monitoring and control as described in this specification.

B. The control shall be mounted on the generator set. The control shall be vibration isolated and prototype tested to verify the durability of all components in the system under the vibration conditions encountered.

C. The generator set mounted control shall include the following features and functions:

1. Control Switches

a. Mode Select Switch. The mode select switch shall initiate the following control modes. When in the RUN or Manual position, the generator set shall start, and accelerate to rated speed and voltage as directed by the operator. A separate push-button to initiate starting is acceptable. In the OFF position the generator set shall immediately stop, bypassing all time delays. In the AUTO position, the generator set shall be ready to accept a signal from a remote device to start and accelerate to rated speed and voltage.

b. EMERGENCY STOP switch. Switch shall be Red "mushroom-head" push-button. Depressing the emergency stop switch shall cause the generator set to immediately shut down, and be locked out from automatic restarting. Switch shall have a cover to prevent accidental activation.

c. RESET switch. The RESET switch shall be used to clear a fault and allow restarting the generator set after it has shut down for any fault condition.

d. PANEL LAMP switch. Depressing the panel lamp switch shall cause the entire panel to be lighted with DC control power. The panel lamps shall automatically be switched off 10 minutes after the switch is depressed, or after the switch is depressed a second time.

2. Generator Set AC Output Metering. The generator set shall be provided with a metering set including the following features and functions:

a. Analog voltmeter, ammeter, frequency meter, and kilowatt (KW) meter. Voltmeter and ammeter shall display all three phases. Meter scales shall be color coded in the following fashion: green shall indicate normal operating condition, amber shall indicate operation in ranges that indicate potential failure, and red shall indicate failure impending. Metering accuracy shall be within 1%

at rated output.

b. Digital metering set, 1% accuracy, to indicate generator RMS voltage and current, frequency, output current, output KW, KW-hours, and power factor. Generator output voltage shall be available in line-to-line and line-to-neutral voltages, and shall display all three phase voltages (line to neutral or line to line) simultaneously.

c. Both analog and digital metering are required. The analog and digital metering equipment shall be driven by a single microprocessor, to provide consistent readings and performance.

d. The control system shall monitor the total load on the generator set, and maintain data logs of total operating hours at specific load levels ranging from 0 to 110% of rated load, in 10% increments. The control shall display hours of operation at less than 30% load and total hours of operation at more than 90% of rated load.

e. The control system shall log total number of operating hours, total kWH, and total control on hours, as well as total values since reset.

3. Generator Set Alarm and Status Display

a. The generator set shall include LED alarm and status indication lamps. The lamps shall be high-intensity LED type. The lamp condition shall be clearly apparent under bright lighting conditions. Functions indicated by the lamps shall include:

- The control shall include five (5) configurable alarm-indicating lamps. The lamps shall be field adjustable for any status, warning, or shutdown function monitored by the generator set. They shall also be configurable for color, and control action (status, warning, or shutdown).

- The control shall include green lamps to indicate that the generator set is running at rated frequency and voltage, and that a remote start signal has been received at the generator set. The running signal shall be based on actual sensed voltage and frequency on the output terminals of the generator set.

- The control shall include a flashing red lamp to indicate that the control is not in automatic state, and red common shutdown lamp.

- The control shall include an amber common warning indication lamp.

b. The generator set control shall indicate the existence of the warning and shutdown conditions on the control panel. All conditions indicated below for warning shall be field-configurable for shutdown. Conditions required to be annunciated shall include:

- Low oil pressure (warning)
- Low oil pressure (shutdown)
- Oil pressure sender failure (warning)
- Low coolant temperature (warning)
- High coolant temperature (warning)
- High coolant temperature (shutdown)
- High oil temperature (warning)
- Engine temperature sender failure (warning)
- Low coolant level (warning)
- Fail to crank (shutdown)
- Fail to start/overcrank (shutdown)
- Overspeed (shutdown)
- Low DC voltage (warning)
- High DC voltage (warning)
- Weak battery (warning)
- Low fuel-base tank (warning)
- High AC voltage (shutdown)
- Low AC voltage (shutdown)
- Under frequency (shutdown)
- Over current (warning)
- Over current (shutdown)
- Short circuit (shutdown)
- Ground fault (warning) (optional – when required by code or specified)
- Over load (warning)
- Emergency stop (shutdown)
- (4) configurable conditions

c. Provisions shall be made for indication of four customer-specified alarm or shutdown conditions. Labeling of the customer-specified alarm or shutdown conditions shall be of the same type and quality as the above specified conditions. The non-automatic indicating lamp shall be red, and shall flash to indicate that the generator set is not able to automatically respond to a command to start from a remote location.

4. Engine Status Monitoring.

   a. The following information shall be available from a digital status panel on the generator set control:

      - Engine oil pressure (psi)
      - Engine coolant temperature (degrees F)
      - Engine oil temperature (degrees F)
      - Engine speed (rpm)
      - Number of hours of operation (hours)
      - Number of start attempts
      - Battery voltage (DC volts)

   b. The control system shall also incorporate a data logging and display provision to allow logging of the last 10 warning or shutdown indications on the generator set, as well as total time of operation at various loads, as a percent of the standby rating of the generator set.

5. Engine Control Functions

   a. The control system provided shall include a cycle cranking system, which allows for user selected crank time, rest time, and # of cycles. Initial settings shall be for 3 cranking periods of 15 seconds each, with 15-second rest period between cranking periods.

   b. The control system shall include an idle mode control, which allows the engine to run in the idle mode in the RUN position only. In this mode, the alternator excitation system shall be disabled.

   c. The control system shall include an engine governor control, which functions to provide steady state frequency regulation as noted elsewhere in this specification. The governor control shall include adjustments for gain, damping, and a ramping function to control engine speed and limit exhaust smoke while the unit is starting.

   d. The control system shall include time delay start (adjustable 0-300 seconds) and time delay stop (adjustable 0-600 seconds) functions.

   e. The control system shall include sender failure monitoring logic for speed sensing, oil pressure and engine temperature which is capable of discriminating between failed sender or wiring

components, and an actual failure conditions.

6. Alternator Control Functions:

a. The generator set shall include a full wave rectified automatic digital voltage regulation system that is matched and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from misoperation due to load-induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The voltage regulation system shall be equipped with three-phase line to neutral RMS sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The system shall include a torque-matching characteristic, which shall reduce output voltage in proportion to frequency below an adjustable frequency threshold. Torque matching characteristic shall be adjustable for roll-off frequency and rate, and be capable of being curve-matched to the engine torque curve with adjustments in the field. The voltage regulator shall include adjustments for gain, damping, and frequency roll-off. Adjustments shall be broad range, and made via digital raise-lower switches, with an alphanumeric LED readout to indicate setting level. Rotary potentiometers for system adjustments are not acceptable.

b. A microprocessor-based protection device shall be provided to individually monitor all phases of the output current of the generator set and initiate an alarm (over current warning) when load current exceeds 110% of the rated current of the generator set on any phase for more than 60 seconds. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (over current shutdown). The protective functions provided shall be in compliance to the requirements of NFPA 70 article 445.

c. A microprocessor-based protection device shall be provided to individually monitor all phases of the output current for short circuit conditions. The control/protection system shall monitor the current level and voltage. The controls shall shut down and lock out the generator set when output current level approaches the thermal damage point of the alternator (short circuit shutdown). The protective functions provided shall be in compliance to the requirements of NFPA 70 article 445.

d. Controls shall be provided to monitor the KW load on the generator set, and initiate an alarm condition (over load) when total load on the generator set exceeds the generator set rating for in excess of 5 seconds. Controls shall include a load shed

control, to operate a set of dry contacts (for use in shedding customer load devices) when the generator set is overloaded.

e. A microprocessor-based protection device AC over/under voltage monitoring system that responds only to true RMS voltage conditions shall be provided. The system shall initiate shutdown of the generator set when alternator output voltage exceeds 110% of the operator-set voltage level for more than 10 seconds, or with no intentional delay when voltage exceeds 130%. Under voltage shutdown shall occur when the output voltage of the alternator is less than 85% for more than 10 seconds. The system shall monitor individual phases and be connected line to neutral on three-phase, four-wire generator sets, and for systems that are solidly grounded.

f. When required by the National Electrical Code or indicated on the Drawings. The Control System shall include a ground fault monitoring relay. The relay shall be adjustable from 3.8-1200 amps, and include adjustable time delay of 0-10.0 seconds. The relay shall be for indication only, and not trip or shut down the generator set. Note bonding and grounding requirements for the generator set, and provide relay that will function correctly in system as installed.

g. The generator set control shall include a 120 VAC-control heater.

7. Other Control Functions:

a. The generator set shall be provided with a network communication module to allow LonMark compliant communication with the generator set control by remote devices. The control shall communicate all engine and alternator data, and allow starting and stopping of the generator set via the network in both test and emergency modes.

b. A battery monitoring system shall be provided which initiates alarms when the DC control and starting voltage is less than 25VDC or more than 32VDC. During engine cranking (starter engaged), the low voltage limit shall be disabled, and if DC voltage drops to less than 14.4 volts for more than two seconds a "weak battery" alarm shall be initiated.

8. Control Interfaces for Remote Monitoring:

a. All control and interconnection points from the generator set to remote components shall be brought to a separate connection box. No field connections shall be made in the control enclosure

or in the AC power output enclosure.

b. The control system shall provide four (4) programmable output relays. These relay outputs shall be configurable for any alarm, shutdown, or status condition monitored by the control. The relays shall be configured to indicate: 1) generator set operating at rated voltage and frequency; 2) common warning; 3) common shutdown; 4) load shed command.

c. A fused 10 amp switched 24VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit whenever the generator set is running.

d. A fused 10 amp 24VDC power supply circuit shall be provided for customer use. DC power shall be available from this circuit at all times from the engine starting/control batteries.

e. Provide two (2) Form C dry contacts for connection to the fire alarm system graphic annunciator panel for "Generator Run" and "Generator Fault" indications.

f. Provide two (2) Form C dry contacts for connection to the Security Intrusion System panel for "Generator Run" and "Generator Fault" indications.

g. The control shall be provided with a direct serial communication link for the LonWorks communication network interface as described elsewhere in this specification and shown on the Drawings.

2.06 MAIN LINE CIRCUIT BREAKER

A. The generator set shall be provided with a mounted main line 100% rated circuit breaker, sized to carry the rated output current of the generator set. The circuit breaker shall incorporate an electronic trip unit that operates to protect the alternator under all overcurrent conditions, or a thermal-magnetic trip with other overcurrent protection devices that positively protect the alternator under overcurrent conditions. The supplier shall submit time overcurrent characteristic curves and thermal damage curve for the alternator, demonstrating the effectiveness of the protection provided.

2.07 REMOTE ALARM ANNUNCIATOR PANEL

A. Provide and install a 20-light LED type remote alarm annunciator with horn, located as shown on the drawings in the building engineer's office or in a location directed by the Owner. The remote annunciator shall provide all the audible and

visual alarms called for by NFPA Standard 110 for level 1 systems for the local generator control panel. Spare lamps shall be provided to allow future addition of other alarm and status functions to the annunciator. Provisions for labeling of the annunciator in a fashion consistent with the specified functions shall be provided. Alarm silence and lamp test switch(es) shall be provided. LED lamps shall be replaceable, and indicating lamp color shall be capable of changes needed for specific application requirements. Alarm horn shall be switchable for all annunciation points. Alarm horn (when switched on) shall sound for first fault, and all subsequent faults, regardless of whether first fault has been cleared, in compliance with NFPA110 3-5.6.2. The interconnecting wiring between the annunciator and other system components shall be monitored and failure of the interconnection between components shall be displayed on the annunciator panel.

B. The annunciator shall include the following alarm labels, audible annunciation features, and lamp colors:

Condition	Lamp Color	Audible Alarm
Normal Power (to Loads)	Green	No
Genset Supplying Load	Amber	No
Genset Running	Green	No
Not in Auto	Red (Flashing)	Yes
High Battery Voltage	Red	Yes
Low Battery Voltage	Red	Yes
Charger AC Failure	Red	Yes
Fail to Start	Red	Yes
Low Engine Temperature	Amber	Yes
Pre-High Engine Temperature	Amber	Yes
High Engine Temperature	Red	Yes
Pre-Low Oil Pressure	Amber	Yes
Low Oil Pressure	Red	Yes
Overspeed	Red	Yes
Low Coolant Level	Amber	Yes
Low Fuel Pressure	Amber	Yes
Network OK	Green	Yes
Fuel Tank Leak	Amber	Yes
(2) Spares	Configurable	Configurable

C. Low battery voltage lamp shall also be lighted for low cranking voltage or weak battery alarm.

2.08 OUTDOOR WEATHER-PROTECTIVE SOUND ATTENUATING HOUSING

A. The generator set shall be provided with a sound-attenuating housing which allows the generator set to operate at full rated load in the ambient conditions previously specified. The enclosure shall reduce the sound level of the generator

set while operating at full rated load to a maximum of 76 dBA at any location 7 meters from the generator set in a free field environment. Housing configuration and materials used may be of any suitable design which meets application needs, except that acoustical materials used shall be non-hydroscopic and oil resistant. No foam materials shall be used unless they can be demonstrated to have the same durability and life as fiberglass.

B. Radiator discharge outlet shall be deflected upward, ducted through built-in hood in an approved manner to allow recommended air flow for engine cooling, and to allow minimum clearance in front of the radiator and also help to reduce the sound level of the generator set.

C. The enclosure shall be constructed of minimum 12 gauge steel for framework and 14 gauge steel for panels. All hardware and hinges shall be stainless steel.

D. The enclosure shall include hinged access doors to maintain easy access for all operating and service functions. Key-locking and padlockable door latches shall be provided for all doors, and include retainers to hold the door open during service. Door hinges shall be stainless steel.

E. Enclosure roof shall be cambered to prevent rainwater accumulation. The roof shall be designed for evenly distributed loading of 50 lbs./square foot. The roof shall also be designed to support the largest commercially available silencer in addition to two 250-lb men during normal maintenance procedures. Additional support added for project specific requirements shall be incorporated where required.

F. Provide motorized louvers and dampers to minimize air flow through the enclosure when the generator set is not operating. Louvers shall include provisions to prevent accumulation of ice or snow that might prevent operation.

G. Inlet ducts shall include rain hoods.

H. The enclosure shall be provided with a factory mounted and wired electrical distribution panel to serve the generator set and enclosure. The provisions shall include:

1. 120/208 VAC, 3-phase, 4-wire, 100 amp panelboard connected to the buildings utility service by this Contractor

2. Two GFCI duplex receptacles, one inside the enclosure and one receptacle outside the enclosure with an “in-use” weatherproof cover.

3. Two three-way switches controlling three AC lamps mounted in vapor tight and gasketed fixtures.

4. Factory-wired normal AC service from the panelboard to the engine

coolant heaters, alternator heaters, battery charger, etc.

I. The enclosure shall be provided with an exhaust silencer which is mounted inside of the enclosure, and allows the generator set package to meet specified sound level requirements. The exhaust shall exit the enclosure through a rain collar and terminate with a rain cap. Exhaust connections to the generator set shall be through seamless flexible connections.

J. All sheet metal shall be primed for corrosion protection and finish painted in a color selected by the Architect. All surfaces of all metal parts shall be primed and painted.

K. Painting of hoses, clamps, wiring harnesses and other non-metallic service parts shall not be acceptable. Fasteners used shall be corrosion resistant, and designed to minimize marring of the painted surface when removed for normal installation or service work.

L. The enclosure shall include the following maintenance provisions:

1. Flexible coolant and lubricating oil drains lines, which extend to the exterior of the enclosure, with internal drain valves.

2. External radiator fill provision.

M. The enclosure shall have sufficient guards and screens to prevent entrance by small animals.

2.09 SEQUENCE OF OPERATION -- GENERATOR SET

A. Generator set shall start on receipt of a start signal from remote equipment. The start signal shall be hardwired connection to the generator set control and a redundant signal over the required network connection.

B. The generator set shall complete a time delay start period as programmed into the control.

C. The generator set control shall initiate the starting sequence for the generator set. The starting sequence shall include the following functions:

1. The control system shall verify that the engine is rotating when the starter is signaled to operate. If the engine does not rotate after two attempts, the control system shall shut down and lock out the generator set, and indicate "fail to crank" shutdown.

2. The engine shall fire and accelerate as quickly as practical to start disconnect speed. If the engine does not start, it shall complete a cycle cranking process as described elsewhere in this specification. If the

engine has not started by the completion of the cycle cranking sequence, it shall be shut down and locked out, and the control system shall indicate "fail to start".

3. The engine shall accelerate to rated speed and the alternator to rated voltage. Excitation shall be disabled until the engine has exceeded programmed idle speed, and regulated to prevent over voltage conditions and oscillation as the engine accelerates and the alternator builds to rated voltage.

D. On reaching rated speed and voltage, the generator set shall operate as dictated by the control system in isochronous state.

E. When all start signals have been removed from the generator set, it shall complete a time delay stop sequence. The duration of the time delay stop period shall be adjustable by the operator.

F. On completion of the time delay stop period, the generator set control shall switch off the excitation system and shall shut down.

G. Any start signal received after the time stop sequence has begun shall immediately terminate the stopping sequence and return the generator set to isochronous operation.

2.11 AUTOMATIC TRANSFER SWITCH (ATS)

A. The complete automatic transfer switch(es) shall be suitable for utility power (source 1) to engine generator set (source 2) application, be completely factory assembled with field programmable digital electronic controls designed for fully automatic operation and including: surge voltage isolation, and including voltage sensors on all phases of both sources, linear operator, permanently attached manual handles, positive mechanical and electrical interlocking, and mechanically held contacts for both sources.

B. Ratings

1. Refer to Drawings for sizes and types of transfer equipment, voltage and ampere ratings, enclosure type, and accessories.

2. Main contacts shall be rated for 600 Volts AC minimum.

3. Transfer switch(es) shall be rated to carry 100 percent of rated current continuously in the enclosure supplied, in ambient temperatures of - 40 to + 60 degrees C, relative humidity up to 95% (non-condensing), and altitudes up to 10,000 feet (3000M).

5. Transfer switch equipment shall have withstand and closing ratings

(WCR) in RMS symmetrical amperes greater than the available fault currents, but not less than 30,000 for an ATS up to 260 amperes and 65,000 for an ATS larger than 260 amperes, at the specified voltage. The transfer switch shall be third party listed and labeled for use with the specified protective device(s) installed in the application.

6. Service-Rated Transfer Switch:

   a. Comply with UL 869A and UL 489.
   b. Provide terminals for bonding the grounding electrode conductor to the grounded service conductor.
   c. In systems with a neutral, the bonding connection shall be on the neutral bus.
   d. Provide removable link for temporary separation of the service and load grounded conductors.
   e. Surge Protective Device: Service rated.
   f. Ground-Fault Protection: Comply with UL 1008 for normal bus.
   g. Service Disconnecting Means: Externally operated, manual mechanically actuated.

C. Construction

1. Transfer switch(es) shall be double-throw, electrically and mechanically interlocked, and mechanically held in the source 1 and source 2 positions. The transfer switch shall be specifically designed to transfer to the best available source if it inadvertently stops in a neutral position.

2. Transfer switches rated through 1000 amperes shall be equipped with permanently attached manual operating handles and quick-make over-center contact mechanisms. Transfer switches over 1000 amperes shall be equipped with manual operators for service use only under de-energized conditions.

3. Main switch contacts shall be high-pressure silver alloy. Contact assemblies shall have arc chutes for positive arc extinguishing. Arc chutes shall have insulating covers to prevent inter-phase flashover.

4. Transfer switch internal wiring shall be composed of pre-manufactured harnesses that are permanently marked for source and destination. Harnesses shall be connected to the control system by means of locking disconnect plug(s), to allow the control system to be easily disconnected and serviced without disconnecting power from the transfer switch mechanism.

5. Transfer switch shall be provided with flame retardant transparent covers to allow viewing of switch contact operation but prevent direct contact with

line voltage components.

6. Four (4) pole transfer switches shall be provided with a switched neutral pole. The neutral pole shall be of the same construction and have the same ratings as the phase poles. All poles shall be switched simultaneously using a common crossbar. Equipment using overlapping neutral contacts is not acceptable.

7. Three (3) pole transfer switches shall be provided with a neutral bus and lugs. The neutral bus shall be sized to carry 100% of the current designated on the switch rating.

8. Heater: Equip switches exposed to outdoor temperatures and humidity, and other units indicated, with an internal heater. Provide thermostat within enclosure to control heater.

D. Connections

1. Field control connections shall be made on a common terminal block that is clearly and permanently labeled.

2. Transfer switch shall be provided with AL/CU mechanical lugs sized to accept the full output rating of the generator set. Lugs shall be suitable for the number and size of conductors shown on the drawings.

E. Transfer Switch Control

1. Operator Panel. Each transfer switch shall be provided with a control panel to allow the operator to view the status and control operation of the transfer switch. The operator panel shall be a sealed membrane panel rated NEMA 3R/IP53 or better (regardless of enclosure rating) that is permanently labeled for switch and control functions. The operator panel shall be provided with the following features and capabilities.

a. High intensity LED lamps to indicate the source that the load is connected to (source 1 or source 2); and which source(s) are available. Source available LED indicators shall operate from the control microprocessor to indicate the true condition of the sources as sensed by the control.

b. High intensity LED lamps to indicate that the transfer switch is "not in auto" (due to control being disabled or due to bypass switch enabled or in operation) and "Test/Exercise Active" to indicate that the control system is testing or exercising the generator set.

c. "OVERRIDE" pushbutton to cause the transfer switch to bypass any active time delays for start, transfer, and retransfer and

immediately proceed with its next logical operation.

d. "TEST" pushbutton to initiate a preprogrammed test sequence for the generator set and transfer switch. The transfer switch shall be programmable for test with load or test without load.

e. "RESET/LAMP TEST" pushbutton that will clear any faults present in the control, or simultaneously test all lamps on the panel by lighting them.

f. The control system shall continuously log information on the number of hours each source has been connected to the load, the number of times transferred, and the total number of times each source has failed. This information shall be available via a PC-based service tool and an operator display panel.

g. Vacuum fluorescent alphanumeric display panel with push-button navigation switches. The display shall be clearly visible in both bright (sunlight) and no light conditions. It shall be visible over an angle of at least 120 degrees. The Alphanumeric display panel shall be capable of providing the following functions and capabilities.

1) Display source condition information, including AC voltage for each phase of normal and emergency source, frequency of each source. Voltage for all three phases shall be displayed on a single screen for easy viewing of voltage balance. Line to neutral voltages shall be displayed for 4-wire systems.

2) Display source status, to indicate source is connected or not connected.

3) Display load data, including 3-phase AC voltage, 3-phase AC current, frequency, KW, KVA, and power factor. Voltage and current data for all phases shall be displayed on a single screen.

4) The display panel shall allow the operator to view and make the following adjustments in the control system, after entering an access code:

i. Set nominal voltage and frequency for the transfer switch.

ii. Adjust voltage and frequency sensor operation set points.

iii. Set up time clock functions.

iv. Set up load sequence functions.

v. Enable or disable control functions in the transfer switch, including program transition.

vi. Set up exercise and load test operation conditions, as well as normal system time delays for transfer time, time delay start, stop, transfer, and retransfer.

5) Display Real Time Clock data, including date, and time in hours, minutes, and seconds. The real time clock shall incorporate provisions for automatic daylight savings time and leap year adjustments. The control shall also log total operating hours for the control system.

6) Display service history for the transfer switch. Display source connected hours, to indicate the total number of hours connected to each source. Display number of times transferred, and total number of times each source has failed.

7) Display fault history on the transfer switch, including condition, and date and time of fault. Faults to include controller checksum error, low controller DC Voltage, ATS fail to close on transfer, ATS fail to close on retransfer, battery charger malfunction, network battery voltage low, network communications error.

8) Display information for other transfer switches in the system, including transfer switch name, real time load in KW on the transfer switch, current source condition, and current operating mode.

F. Internal Controls

1. The transfer switch control system shall be configurable in the field for any operating voltage level up to 600VAC. Provide RMS voltage sensing and metering that is accurate to within plus or minus 1% of nominal voltage level. Frequency sensing shall be accurate to within plus or minus 0.2%. Voltage sensing shall be monitored based on the normal voltage at the site. Systems that utilize voltage monitoring based on standard voltage conditions are not acceptable.

2. Transfer switch voltage sensors shall be close differential type, providing

source availability information to the control system based on the following functions:

a) Monitoring all phases of the normal service (source 1) for under voltage conditions (adjustable for pickup in a range of 85 to 98% of the normal voltage level and dropout in a range of 75 to 98% of normal voltage level).

b) Monitoring all phases of the emergency service (source 2) for under voltage conditions (adjustable for pickup in a range of 85 to 98% of the normal voltage level and dropout in a range of 75 to 98% of pickup voltage level).

c) Monitoring all phases of the normal service (source 1) and emergency service (source 2) for voltage imbalance.

d) Monitoring all phases of the normal service (source 1) and emergency service (source 2) for loss of a single phase.

e) Monitoring all phases of the normal service (source 1) and emergency service (source 2) for phase rotation.

f) Monitoring all phases of the normal service (source 1) and emergency service (source 2) for over voltage conditions (adjustable for dropout over a range of 105 to 135% of normal voltage, and pickup at 95-99% of dropout voltage level).

g) Monitoring all phases of the normal service (source 1) and emergency service (source 2) for over or under frequency conditions.

h) Monitoring the neutral current flow in the load side of the transfer switch. The control shall initiate an alarm when the neutral current exceeds a preset adjustable value in the range of 100-150% of rated phase current for more than an adjustable time period of 10 to 60 seconds.

3. All transfer switch sensing shall be configurable from a Windows XP or NT PC-based service tool, to allow setting of levels, and enabling or disabling of features and functions. Selected functions including voltage sensing levels and time delays shall be configurable using the operator panel. The transfer control shall incorporate a series of diagnostic LED lamps.

4. The transfer switch shall be configurable to control the operation time from source to source (program transition operation). The control system shall be capable of enabling or disabling this feature, and adjusting the

time period to a specific value. A phase band monitor or similar device is not an acceptable alternate for this feature.

5. The transfer switch shall incorporate adjustable time delays for generator set start (adjustable in a range from 0-15 seconds); transfer (adjustable in a range from 0-120 seconds); retransfer (adjustable in a range from 0-30 minutes); and generator stop (cool down) (adjustable in a range of 0-30 minutes).

6. The transfer switch shall be configurable to accept a relay contact signal and a network signal from an external device for load shedding purposes. On receipt of this signal, the transfer switch shall switch to a neutral position when connected to source 2. If source 1 is available when the load-shed signal is received, the transfer switch shall connect to source 1.

7. The transfer switch shall be configurable to accept a relay contact signal and a network signal from an external device to prevent transfer to the generator service.

8. The transfer switch shall provide a relay contact signal prior to transfer or retransfer. The time period before and after transfer shall be adjustable in a range of 0-50 seconds.

9. The control system shall be designed and prototype tested for operation in ambient temperatures from -40C to +70C. It shall be designed and tested to comply with the requirements of the noted voltage and RFI/EMI standards.

10. The control shall have optically isolated logic inputs, high isolation transformers for AC inputs, and relays on all outputs, to provide optimum protection from line voltage surges, RFI and EMI.

11. The transfer switch network monitoring equipment, when supplied, shall be provided with a battery based auxiliary power supply to allow monitoring of the transfer switch when both AC power sources are non-operational. The battery power supply shall be monitored for proper condition, and the transfer switch shall include an alarm condition to indicate low battery condition.

G. Control Interface

1. The transfer switch will provide an isolated relay contact for starting of a generator set. The relay shall be normally held open, and close to start the generator set. Output contacts shall be form C, for compatibility with any generator set.

2. Provide one set of Form C auxiliary contacts on both sides, operated by

transfer switch position, rated 10 amps 250 VAC.

3. The transfer switch shall provide relay contacts to indicate the following conditions: source 1 available, load connected to source 1, source 2 available, source 2 connected to load.

4. The transfer switch shall be provided with a network communication card, and configured to allow LonMark compliant communication with the transfer switch and other network system components. The network shall provide a redundant start signal to the generator set(s) in the system.

H. Enclosure

Enclosures shall be UL listed, NEMA Type 3R or better or as shown on the Drawings. The cabinet shall provide code-required wire bend space. Manual operating handles and all control switches (other than key-operated switches) shall be accessible to authorized personnel only by opening the key-locking cabinet door. Transfer switches with manual operating handles and/or non key-operated control switches located on outside of cabinet do not meet this specification and are not acceptable.

2.12. SEQUENCE OF OPERATION – AUTOMATIC TRANSFER SWITCH(ES)

A. Transfer switch normally connects an energized utility power source (source1) to loads and a generator set (source 2) to loads when normal source fails. The normal position of the transfer switch is source 1 (connected to the utility), and no start signal is supplied to the generator set.

B. Standby electrical power systems for Fairfax County Shelters shall have a remote manual override switch(es) of the type and locations shown on the Drawings. The override switch shall have two settings, NORMAL MODE and SHELTER MODE. NORMAL MODE switch position shall **not** allow the transfer switch to send a start signal to the generator set to operate upon loss of utility power. SHELTER MODE switch position **shall** allow the generator set to operate upon loss of utility power and the transfer switch to transfer the loads to the generator set.

C. Generator Set Exercise (Test) With Load Mode. The control system shall be configurable to test the generator set under load. In this mode, the transfer switch shall control the generator set in the following sequence:

1. Transfer switch shall initiate the exercise sequence at a time indicated in the exercise timer program, or when manually initiated by the operator.

2. When the control systems senses the generator set at rated voltage and frequency, it shall operate to connect the loads to the generator set by opening the normal source contacts, and closing the alternate source

contacts a predetermined time period later. The timing sequence for the contact operation shall be programmable in the controller.

3. The generator set shall operate connected to the load for the duration of the exercise period. If the generator set fails during this period, the transfer switch shall automatically reconnect the generator set to the normal service.

4. On completion of the exercise period, the transfer switch shall operate to connect the loads to the normal source by opening the alternate source contacts, and closing the normal source contacts a predetermined time period later. The timing sequence for the contact operation shall be programmable in the controller.

5. The transfer switch shall operate the generator set unloaded for a cool down period, and then remove the start signal from the generator set. If the normal power fails at any time when the generator set is running, the transfer switch shall immediately connect the system loads to the generator set only when the remote manual override switch is set to "SHELTER MODE", otherwise the generator set shall continue with the normal exercise sequence.

D. Generator Set Exercise (Test) Without Load Mode. The control system shall be configurable to test the generator set without transfer switch load connected. In this mode, the transfer switch shall control the generator set in the following sequence:

1. Transfer switch shall initiate the exercise sequence at a time indicated in the exercise timer program, or when manually initiated by the operator.

2. When the control systems senses the generator set at rated voltage and frequency, it shall operate the generator set unloaded for the duration of the exercise period.

3. At the completion of the exercise period, the transfer switch shall remove the start signal from the generator set. If the normal power fails at any time when the generator set is running, the transfer switch shall immediately connect the system loads to the generator set only when the remote manual override switch is set to "SHELTER MODE", otherwise the generator set shall continue with the normal exercise sequence.

PART 3 - EXECUTION

3.01 INSTALLATION

A. This Contractor shall furnish and install complete the standby electrical power

system including the engine generator set, automatic transfer switch(es), batteries and charging system, exhaust system, vibration isolation, cooling system, electrical system, concrete pad, generator-base fuel tank, man-way platforms, enclosure, and accessories in accordance with the system manufacturer's recommendations.

B. Equipment shall be installed by this Contractor in accordance with final submittals and contract documents. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction. Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.

C. Installation of equipment shall include furnishing and installing all interconnecting wiring between all major equipment provided for the on-site power system. The contractor shall also perform interconnecting wiring between equipment sections (when required), under the supervision of the equipment supplier.

D. The Contractor shall furnish and install a concrete base for the engine generator set and generator base fuel tank, as shown on the drawings. Equipment shall be permanently fastened to the concrete pad in accordance with the manufacturer's instructions.

1. Concrete foundation shall be as follows:

   a. Minimum compressive strength at 28 days – 3500 PSI
   b. Maximum nominal aggregate size – 1 inch
   c. Maximum W/C ratio by mass – 0.45
   d. Air content – 5 + 1%
   e. Slump – 2" + 0.75"

2. Top of concrete bases shall be trowel finished smooth and level with beveled edges. Top surface shall not vary by more than 1/8" in depth as measured across the widest surface.

3. All concrete shall be fully vibrated.

4. Reinforcing Steel – Reinforcing to meet ASTM requirements. Spacing of bars shall be adjusted to suit conduit spacing.

E. This Contractor shall ground the generator set as per the NEC, as shown on the Drawings, and as herein specified.

F. All equipment shall be physically inspected for damage. Scratches and other installation damage shall be repaired. Equipment shall be thoroughly cleaned to remove all dirt and debris prior to initial operation and final testing of the system.

G. All fuel tanks shall be field testing in accordance with the requirements of the

authority having jurisdiction (AHJ). All fuel tanks shall be filled to full capacity by this Contractor after final testing and Owner acceptance.

3.02 START-UP SERVICE AND ACCEPTANCE TEST

A. Start-up Service: The standby electrical power system's equipment shall be initially started, operated and tested by the manufacturer's representative prior to the "on-site acceptance test". The Owner shall be notified in advance before any testing in order to coordinate any possible disruption or downtime with the school or facility.

B. On-Site Acceptance Test:

1. The manufacturer shall furnish service personnel and all testing equipment and temporary cable connections to completely service and field test, in the presence of the Owner, the standby electrical power system.

2. The test shall include, but not be limited to, a "cold start" test, a minimum period of four (4) hours with a load bank test at one hundred percent (100%) of the nameplate rating of the engine generator set and a one step rated load pickup test in accordance with NFPA 110. The manufacturer shall make any adjustments to the system to assure proper operation.

3. The manufacturer shall instruct the Owner's personnel as to proper maintenance and operation and furnish three (3) sets of operating, technical, factory service manuals and maintenance instructions, including descriptive literature of equipment, parts list, and the names and telephone numbers of manufacturer's representatives.

3.03 SOFTWARE AND TRAINING

A. The manufacturer shall supply to the Owner a complete set of service and maintenance software for use in properly supporting the product. The software shall be provided at a training class attended by the Owner's personnel, to qualify them in proper use of the software. The software shall have the following features and capabilities:

1. The software shall be 32 bit and shall be Windows '95, Windows '98, XP, and NT compatible.

2. The software shall use the Windows "Explorer" format, for ease of use and commonality with other software in use at the facility.

3. The software shall allow adjustment of all functions described herein via the tool; adjustment of operating levels of all protective functions; and

programming of all optional functions in the controller. Adjustments shall be possible over modem from a facility that is remote from the generator set.

4. The software shall allow simulation of fault conditions, to verify operation of all protective devices.

5. The software shall include the ability to store and display data for any function monitored by the generator set control. This data shall be available in common file formats, and on graphical "strip chart" displays.

6. The software shall automatically record all control operations and adjustments performed by any operator or software user, for tracking of changes to the control.

7. The software shall display all warning, shutdown, and status changes programmed into transfer switch controller. For each event, the control shall provide information on the nature of the event, when it last occurred, and how many times it has occurred.

8. The software shall include detailed operation and service information on the specific generator set supplied, so that no other documentation (other than schematic and wiring diagram drawings) is necessary for service of the product.

9. The software shall have been developed under strict quality control guidelines, and comply with the requirements of ISO 9001 and Mil Standard 498 for software development.

B. After generator set installation and successful acceptance test, the generator set supplier shall conduct a complete operation, basic maintenance, and emergency service seminary for up to 10 persons employed by the Owner. The seminary shall include instruction on operation of the transfer equipment, normal testing and exercise, adjustments to the control system, use of the PC based service and maintenance tools provided under this contract, and emergency operation procedures. The class duration shall be at least 8 hours in length, and include practical operation with the installed equipment.

3.04 WARRANTY

A. The warranty for the complete standby electric power system shall be unconditional for a period of one (1) year with unlimited operating hours from the date of the successful acceptance test. The warranty shall be furnished by the system manufacturer. Said coverage shall be for all equipment provided under this specification section whether or not it is manufactured by the Standby Electrical System Manufacturer and shall include parts, labor, travel expenses, and labor to remove/reinstall said equipment per the manufacturer's standard published warranty. There shall be no deductibles applied to said warranty.

Multiple warranties for individual components, engine alternator, controls, etc. will not be acceptable. Satisfactory warranty documents shall be furnished. Refer to SECTION 01740 WARRANTIES AND BONDS.

B. Contractor shall provide Warranty Coverage Labels mounted conspicuously on the engine generator control section and on the door of the automatic load transfer switch. The labels shall identify the one source supplier/manufacturer's address and telephone number, coverage description, coverage type, start-up date, model number, serial number, system registration number and other information deemed pertinent by the supplier/manufacturer. It is the intent of this warranty specification to have a single source contact for the Owner to call for warranty service for all standby electrical power system equipment.

C. The manufacturer shall be prepared to offer a service contract for the maintenance of the standby electric power system after the warranty period and/or an extended warranty.

END OF SECTION

SECTION 16435

BRANCH CIRCUIT PANELBOARDS

PART 1 - GENERAL

1.01 REQUIREMENTS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 SCOPE

A. The work covered under this Section shall include furnishing and installing circuit breaker type branch circuit panelboards complete for all systems as shown on the Drawings and herein specified.

1.03 QUALITY ASSURANCE

A. All equipment, materials, and their installation shall conform to the requirements of the National Electrical Code (NEC), local code requirements, and these Specifications.

B. All equipment and materials shall be listed by Underwriter's Laboratories, Inc. (UL) for their intended use and shall bear the UL label.

C. Equipment shall be constructed in accordance with National Electrical Manufacturer's Association (NEMA) standards.

D. Submittals are required in accordance with SECTION 16010 of these Specifications. The manufacturer shall furnish, but not be limited to the following:

1. Circuit breaker layout with dimensions and nameplate designation.

2. Circuit breaker trip ratings and frame sizes.

3. Assembly ratings, including short-circuit rating, voltage, and continuous current rating.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver material and products in factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations.

B. Each panelboard section shall be delivered in individual shipping cases and individually wrapped for protection.

C. Store in a clean, dry space. Maintain factory protection and /or provide an additional heavy canvas or heavy plastic cover to protect panelboards from dirt, water, construction debris, and traffic. Where applicable, provide adequate heating within enclosures to prevent condensation.

D. Handle in accordance with NEMA PB1.1 and manufacturer's written instructions. Handle carefully to avoid damage to panelboards internal components, enclosure and finish.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. The branch circuit panelboards shall be as manufactured by CUTLER-HAMMER, GENERAL ELECTRIC or SIEMENS.

2.02 CIRCUIT BREAKERS

A. Electrical circuits shall be protected by molded case circuit breakers as indicated on the Drawings.

B. The circuit breakers shall be operated by a toggle type handle and shall have a quick-make, quick-break over-center switching mechanism that shall be mechanically trip free from the handle so that the contacts cannot be held closed against short circuits and abnormal currents. Tripping due to overload or short circuit shall be clearly indicated by the handle automatically assuming a position midway between the manual "ON" and "OFF" positions. All latch surfaces shall be ground and polished. All poles of a multi-pole breaker shall be so constructed that they open, close, and trip simultaneously.

C. The circuit breakers shall be completely enclosed in a molded case. Non-interchangeable trip breakers shall have their covers sealed; interchangeable trip breakers shall have the trip unit sealed to prevent tampering. Ampere ratings shall be clearly visible. Contacts shall be non-welding silver alloy. Arc extinction shall be accomplished by means of arc chutes consisting of metal grids mounted in an insulating support. Breakers shall be of the bolt-on type; plug-in, plug-on, blow-on, and clamp-on circuit breakers shall not be acceptable.

D. Circuit breakers shall be 80% rated unless indicated on the Drawings to be 100% rated.

E. Circuit breakers shall have a minimum symmetrical interrupting capacity as indicated on the Drawings. The interrupting ratings of the circuit breakers shall

be at least equal to, or greater than, the available short circuit at the line terminals and not less than those values shown on the Drawings and specified in this specification section.

F. Circuit breakers shall be listed with UL, conform to the applicable requirements of the latest issue of NEMA Standards Publication No. AB1.

G. Circuit breakers shall have thermal-magnetic trip units, with inverse time-current characteristics, unless otherwise noted on the Drawings and/or specified herein.

1. Automatic operation of all circuit breakers shall be obtained by means of thermal-magnetic tripping devices located in each pole providing inverse time delay and instantaneous circuit protection. Instantaneous pick-up settings for each phase shall be adjustable on all frames 250A and above.

2. Circuit breakers shall be ambient compensating in that, as the ambient temperature increases over 40° C, the circuit breaker automatically derates itself to better protect its associated conductor.

I. Where a circuit breaker is the disconnecting means for fire alarm equipment, a listed breaker locking device shall be installed.

J. Circuit breaker accessories: Provide shunt trips, bell alarms and auxiliary switches, etc. as may be shown on the drawings. All accessories shall be UL Listed for field installation.

K. Circuit breakers shall be manufactured by the same manufacturer as the panelboard and factory installed.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The cabinets and enclosures shall be mounted in accordance with the NEC. This Contractor shall furnish all materials necessary for mounting the branch circuit panelboards.

B. Install units plumb, level and rigid without distortion to the branch circuit panelboard.

C. Branch circuit panelboard interiors shall be factory assembled with circuit breakers, wire connectors, etc. Circuit breakers shall be sequence numbered to correspond with the panelboard directory.

D. Contractor shall install required safety labels.

E. The mounting of junction boxes, wire troughs, and auxiliary gutters to the top, bottom or sides of a branch circuit panelboard is prohibited unless approved by the FCPS technical inspection staff on a case by case basis.

3.02 FIELD TESTS

A. Check tightness of all accessible mechanical and electrical connections to assure they are torqued to the minimum acceptable manufacturer's recommendations.

B. Check all panelboards for proper grounding, fastening and alignment.

3.03 FIELD ADJUSTMENTS

A. This Contractor shall perform field adjustments of the protective devices as required to place the equipment in final operating condition. Necessary field settings of devices and adjustments and minor modifications to equipment shall be carried out by this Contractor at no additional cost to the Owner.

3.04 CLEANING

A. Remove debris from panelboards and wipe dust and dirt from all components.

B. Repaint marred and scratched surfaces with touch-up paint to match original finish.

3.05 EXISTING BRANCH CIRCUIT PANELBOARDS

A. This Contractor shall clean, adjust, and tighten all feeder and branch circuit connections (new and existing) and provide new typewritten directories (as described above) in all existing branch circuit panelboards that are associated with work on this project. Panelboard's not associated with work on this project are not subject to this requirement.

END OF SECTION

SECTION 16460

GROUNDING

PART 1 - GENERAL

1.01 REQUIREMENTS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 SCOPE

A. The work under this Section shall consist of furnishing and installing grounding systems as shown on the Drawings and herein specified.

1.03 QUALITY ASSURANCE

A. All equipment, materials, and their installation shall conform to the requirements of the National Electrical Code (NEC), local code requirements, and these Specifications.

B. All equipment and material shall be listed by Underwriter's Laboratories, Inc. (UL) for their intended use and shall bear the UL label.

C. Equipment shall be constructed in accordance with National Electrical Manufacturer's Association (NEMA) standards.

1.04 DESCRIPTION

A. The equipment grounding system shall be designed so all building steel, metallic structures, raceways, enclosures, cabinets, machine frames, junction boxes, outlet boxes, portable equipment, and all other conductive items in close proximity with electrical circuits operate continuously at ground potential providing a low impedance path for possible ground fault currents.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. The equipment grounding conductors and straps shall be sized in compliance with the NEC. All equipment grounding conductors shall be provided with green insulation equivalent to the insulation on the associated phase conductors. The related feeder and branch circuit grounding conductors shall be connected to the ground bus with pressure connectors. A feeder serving several panelboards shall have a continuous grounding conductor which shall be connected to each

related cabinet ground bus.

B. This Contractor shall furnish and install a separate green insulated equipment grounding conductor for each single or three-phase feeder and each branch circuit with a two-pole or three-pole protective device. The required grounding conductor shall be installed in the same raceway with the related phase and/or neutral conductors. Where there are parallel feeders installed in more than one raceway, each raceway shall have a green insulated equipment ground conductor. Single-phase branch circuits required for 120 and 277 volt lighting, receptacles, and motors shall consist of phase and neutral conductors installed in a common metallic raceway, which shall serve as the grounding conductor. Flexible metallic conduit equipment connections utilized in conjunction with the above single-phase branch circuits shall be provided with suitable green insulated grounding conductors connected to grounding terminals at each end of the flexible conduit.

C. This Contractor shall furnish and install in the same raceway with the associated phase and/or neutral conductors, a green colored equipment ground conductor having the same type insulation and connected as described below:

1. Where electrical devices, such as heaters, are installed in air ducts, provide a green insulated equipment ground conductor sized in accordance with the NEC based on the rating of the overcurrent device supplying the unit. This conductor shall be bonded to the ground bus in the associated panelboard.

2. From the equipment ground bus in panelboards through raceways and flexible metallic conduit to ground terminal in a connection box mounted on three-phase motors, furnish and install a ground conductor sized as herein specified. Where the motor has a separate starter and disconnecting device, the ground conductor shall originate at the ground bus in the panelboard. Motors shall be bonded to each starter and disconnecting device enclosure.

C. Ground Rods: Copper-clad steel, 5/8 inch by 8-ft.

D. Conductors:

1. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

2. Bare Copper Conductors:

a. Solid Conductors: ASTM B3.
b. Stranded Conductors: ASTM B8.
c. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.

d. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
e. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch wide and 1/16 inch thick.

PART 3 - EXECUTION

3.01 POWER SYSTEM GROUNDING

A. Branch circuit grounding: This Contractor shall furnish and install grounding bushings, ground terminal blocks, and grounding jumpers at distribution centers, pullboxes, panelboards, and the like.

B. Bonding jumpers: This Contractor shall furnish and install a green insulated bonding conductor (size shall correlated with the over-current device protecting the conductor) attached to grounding bushings on the raceway, to lugs on boxes, and other enclosures.

C. Bonding conductors: This Contractor shall furnish and install a bonding conductor in all flexible conduits connected at each end to a grounding bushing.

D. Pole mounting luminaire (lighting fixture) grounding: This Contractor shall furnish and install a ground conductor with green insulation to the lighting standard (pole). Connect to a corrosion-resistant ground stud or ground clamp furnished as part of the standard. The ground conductor shall originate and be run with the branch circuit wiring.

E. All electrical outlets shall be connected from the device grounding terminal to the outlet box with No. 12 AWG green insulated conductor. This Contractor shall furnish and install a green screw terminal in the outlet box and a continuous green ground conductor from the green terminal screw to the grounding systems as indicated on the Drawings.

F. Metallic Fences: Comply with requirements of IEEE C2.

1. Grounding Conductor: Bare copper, not less than No. 6 AWG.
2. Gates: Must be bonded to the grounding conductor with a flexible bonding jumper.
3. Barbed Wire: Strands must be bonded to the grounding conductor.

3.02 FENCE GROUNDING

B. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.

C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inch below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.

D. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.

3.03 TESTS

A. The completed grounding system shall be subjected to a ground resistance test with an earth test megger to ensure that the ground resistance, without chemical treatment or other artificial means, does not exceed five (5) ohms at the service entrance equipment's ground bus. The Contractor shall furnish and install additional ground rods and conductors from the exterior ground grid to achieve the required resistance to ground. Testing equipment must be calibrated to the manufacturer's requirements. Upon request, the Contractor shall provide documentation of the testing equipment's most recent calibration.

END OF SECTION