

DURHAM PUBLIC SCHOOLS
Lakeview School
Controls Replacement

Dewberry Project No. 50155237
DPS Project #341-03



PROJECT MANUAL

PREPARED FOR:

Durham Public Schools
Construction and Capital Planning
2011 Hamlin Road
Durham, NC 27704

March 24, 2023

PREPARED BY:

Dewberry Engineers, Inc.
2610 Wycliff Road
Suite 410
Raleigh, NC 27607
Phone: 919.881.9939
Fax: 919.881.9923
www.dewberry.com
NC License No.: F-0929

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Durham Public Schools
3507 Dearborn Dr, Durham, NC 27704

DPS #: 314-03

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RFP # 179-2223-674-CTRL_Lakeview
ADVERTISEMENT FOR BIDS
Durham Public Schools / Durham County

Sealed bids from licensed contractors will be received by Durham Public Schools, Durham, North Carolina on **Monday, April 10, 2023** for furnishing of labor, material, and equipment for the DPS Lakeview School Controls Replacement, 3507 Dearborn Dr, Durham, NC 27704. Bids will be received up to **2:00pm** from Single Prime bidders at which time and place all bids will be publicly opened and read aloud. Deliver bids to the **Durham Public Schools Office located at 2011 Hamlin Road, Durham, NC 27704.**

- No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of sixty (60) days.
- Bid security required is 5% of the bid in cash, certified check, or Bid Bond.
- Performance and Payment Bonds for 100% of the contract amount will be required.
- Durham Public Schools reserves the right to reject any and all bids and to waive informalities or irregularities.

Minority Business Participation: Bidders shall note that compliance with County of Durham MBE policies and the North Carolina Statute 143-128.2 (c) are required for this project.

Iran Divestment Act: Bidders shall note that the submission of a bid constitutes the bidder's certification to the State Treasurer that, as of the date of bid, it is not listed on the Final Divestment List created and maintained by the North Carolina Department of State Treasurer (the "Treasurer's Office") pursuant to the Iran Divestment Act of 2015, Chapter 147-Article 6E of the General Statutes of North Carolina (the "Iran Divestment Act").

Davis-Bacon Act: The successful bidder will be required to conform to the wage requirements prescribed by the federal Davis-Bacon and Related Acts which requires that all laborers and mechanics employed by contractors and subcontractors performing on contracts funded in whole or in part with federal funds in excess of \$2,000 pay their laborers and mechanics not less than the prevailing wage rates and fringe benefits, as determined by the Secretary of Labor, for corresponding classes of laborers and mechanics employed on similar projects in the area.

Project scope: The scope of this project is to replace existing system controllers, sensors, enclosures, and field devices. Existing actuators, free stats, valves, and relays are intended to remain. Any found not functional during checkout are to be captured on a deficiency report and replaced as needed. Integrate new equipment into the existing control system, previously installed, as per accompanying as-builts.

Pre-Bid Conference: Scheduled for **Tuesday, March 28, 2023 at 10:00am at 3507 Dearborn Dr., Durham Meet at the front entrance of the school, then the group will travel throughout the school.** Inspection of the site shall be scheduled immediately after the Pre-Bid Conference. The project Designer or Designer's representative will be available to answer questions. It is **Non Mandatory** that prime bidders attend the entire Pre-Bid Conference and visit the site prior to bidding.

Preferred Brands Conference: A preferred brands conference shall follow the pre-bid conference at 10:30am. Inspection of the project site shall follow.

Statement of Qualifications: Each proposal shall be accompanied by a statement of qualifications that demonstrates experience in at least five (5) projects of similar scope within the past three (3) years with references.

Statement of ability to staff project: Each proposal shall be accompanied by a statement of ability to staff including current project load, current staff levels, and individual staff to be committed to this project if awarded.

Durham Public Schools

RFP # 179-2223-674-CTRL_Lakeview

Attn: Kevin Coyne

Direct all inquiries concerning this RFP to:

Durham Public Schools/LeCHASE

Attn: Kevin Coyne

All questions must be submitted via email no later than 2:00pm on Friday, March 31, 2023.

Email: kevin.coyne@leCHASE.com

Issue RFP	03/23/2023
Pre-Bid	03/28/2023 @ 10:00am
Last RFI	03/31/2023 @ 2:00pm
Last Addenda	04/03/2023 @ 3:00pm
Bid Opening	04/10/2023 @ 2:00pm

Thank you for your consideration. Signed:

Wilma Jordan, Director
Construction and Capital Planning
Durham Public Schools, Durham, North Carolina

INFORMATION AVAILABLE TO BIDDERS

Durham Public Schools

A-1. SUBMISSION OF BIDS AND BID OPENING:

- A. Bids will be received by Durham Public Schools (DPS) and will be opened and read at the times and places set forth in the Advertisement for Bids. Bidders, or their representative, and other interested persons may be present at the opening of proposals.
- B. The envelopes containing the bids must be sealed and addressed to Durham Public Schools, 511 Cleveland Street Durham, NC 27701, and marked on the outside of the envelope "Bid Proposal for **DPS Lakview School Controls Replacement**" with the name of the Bidder and his North Carolina State Contractor's License Number.
- C. The Bidder shall assume full responsibility for timely delivery at the exact location designated for receipt of Bids.
- D. In accordance with the Advertisement for Bids, bids will be received for a Single Prime Construction Contract.

A-2. BID DOCUMENTS:

- A. Bid Documents include the Advertisement for Bids, Information for Bidders, Form of Proposal, the Bid Security and the proposed Contract Documents, including any Addenda issued prior to receipt of bids. All requirements and obligations of the Bid Documents are hereby incorporated by reference into the Contract Documents and are binding on the Successful Bidder upon award of the contract.
- B. Bidders may obtain complete sets of the Bid Documents from the issuing office designated in the Advertisement for Bids in the number and for the price, if any, stated therein.
- C. Bidders shall use complete sets of Bid Documents in preparing Bids; neither the Owner nor the Design Consultant shall assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.
- D. By making the Bid Documents available on the above terms, the Owner does so only for the purpose of obtaining Bids on the Work and does not confer a license or grant for any other use.

A-3. DEFINITIONS:

A. THE BID:

A Bid is a complete and properly signed proposal to do the work or designated portion thereof for the sums stipulated therein, submitted in accordance with the Bidding Documents and North Carolina law.

B. BASE BID:

The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which work may be added or from which work may be deleted for sums stated in Alternate Bids, if any.

C. ALTERNATES:

An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

A-4. QUALIFICATION OF BIDDER:

- A. If requested by the Owner prior to the signing of the contract, the successful Bidder shall submit a statement of work to be performed by his own forces.
- B. Prior to Contract award or within seven days of the Owner's request to do so, the successful Bidder shall be prepared to demonstrate that his present organization, direct labor force and prior work experience is of adequate size and development to maintain responsible control of the project and to schedule, coordinate and perform the work in an expeditious manner and in accordance with the Contract Documents.
- C. At the request of the Owner, the Bidders, whether residents or nonresidents in North Carolina must be able to show documented evidence of the following:
 - 1. A contractor's license in good standing with the North Carolina General Contractor's Licensure Board (or NC State Board of Examiners for Plumbing, Mechanical, Electrical, and / or Fire Protection only projects) with the appropriate level of limitations and classifications.
 - 2. A current registration in good standing with the North Carolina Secretary of State's to allow the Bidder do business in the State of North Carolina.
- D. The Owner will consider, in determining the qualifications of a Bidder, their record in the performance of any contracts for construction work into which they may have entered with the Owner or with similar public or private bodies or corporations. The Owner expressly reserves the right to reject the bid of any Bidder if such record discloses that such Bidder, in the opinion of the Owner, has not properly performed such contracts or has habitually and without just cause neglected the payment of bills, or has otherwise disregarded his obligations, Subcontractors, material men, suppliers or employees.
- E. The Owner may make such investigation as they deem necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner

all such information and data for this purpose as they may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of such Bidder, fails to satisfy the Owner that such Bidder is a responsive and responsible Bidder in accordance with N.C. Gen. Stat. 143-128 and 143-129, and the criteria set forth herein. Conditional bids will not be accepted.

A-5. BIDDER'S REPRESENTATIONS:

By submitting his bid, each Bidder represents that:

- A. The Bidder has read and understands the Bid Documents and their Bid is made in accordance therewith; and Bidder agrees to be bound by the terms and requirements set forth in the Bid and Contract Documents.
- B. The Bidder has visited the site, has familiarized themselves with the local conditions under which the Work is to be performed in accordance with Article A-10 herein, and has correlated its observations with the requirements of the proposed Contract Documents.
- C. Prior to the submission of the bid, the Bidder has made known to the Owner any significant discrepancies discovered during the preparation of its bid. These are items that could result in a significant change in time or money.
- D. The submitted bid is based upon the materials, systems and equipment required by the Bidding Documents without exception.
- E. The Bidder has the capability, in all respects, and the moral and business integrity, reliability, technical ability, financial resources, plant, management, superintendence, equipment and materials which will assure effective and efficient good faith performance in full compliance with the Contract Documents and with any and all schedules and Milestone and Completion dates required by the Owner. The Bidder acknowledges and represents that he has made allowances for normal inclement weather as outlined in the Contract Documents, in his estimating, planning and scheduling of the Work. The Bidder hereby certifies that the work shall be completed, in place, in full accordance with the Contract Documents, within the time limits specified.
- F. The Bidder agrees that upon receipt of the Notice of Award, he will execute the formal Contract, and will deliver all bonds and proof of insurance coverage as required by the Specifications.
- G. The Bidder agrees to execute the formal Contract within ten (10) days from the date of Notice of Award, and in case he fails or neglects to appear within the specified time to execute the Contract, he will be considered as having abandoned the Contract, and the Bid Security accompanying this Proposal will be forfeited to the Owner by reason of such failure on the part of the Bidder.
- H. He has made a good faith effort to solicit Minority Business Enterprises (MBEs) per N.C. Gen. Stat. 143-128.2, as subcontractors. The Bidders shall provide the Owner a notarized affidavit with its bid stating that it made the good faith effort required pursuant to G.S. 143-128.2. The Bidder's failure to file the affidavit with its bid shall be grounds for rejection of the Bid.

A-6. BID SECURITY:

- A. Each bid must be accompanied by (1) cash; or (2) a Cashier's Check or a Certified Check of the Bidder in an amount not less than 5% of the bid, made payable to the Owner; or (3) a bidder's bond on the Bid Bond Form provided herein or on a similar form which in every respect materially complies with said Bid Bond, in the amount of 5% of his bid. For purposes of this provision, the amount of the bid shall be the Base Bid plus all positive amount alternates. The Bidder's bond shall be issued by a surety company licensed to conduct business in the state of North Carolina and acceptable to the Owner.

- B. Said bid security is given as a guarantee that the Bidder will enter into a contract if awarded the work and, in the case of refusal or failure to so enter into said contract, the security shall be declared forfeited to the Owner. Such security shall be returned to all but the three lowest Bidders within three days after the opening of bids and the remaining security will be returned within 48 hours after the Owner and the successful Bidder have executed the Contract. If no Contract has been awarded or the bidder has not been notified of the acceptance of his bid within sixty (60) days of the bid opening, the Bidder may withdraw his bid and request the return of his bid security. If, at the Owner's request, the Bidder agrees to extend and maintain his bid beyond the specified 60 days, his bid security will not be returned until the expiration of the period of extension.

A-7. FORFEITURE OF BID BOND:

The Successful Bidder, upon his failure or refusal to execute the Contract within ten (10) days after he has received Notice of Award, shall forfeit to the Owner the security deposited with his bid in accordance with North Carolina General Statute 143-129.

A-8. EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this contract, the contractor agrees as follows:

- A. The contractor will not discriminate against any employee or applicant for employment because of race, handicap, age, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to race, handicap, age, color, religion, sex or national origin. Such action shall include but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or recruiting advertising, layoff or termination rates of pay or other forms of compensation, and selection for training including apprenticeship. The contractor agrees to post in conspicuous places available to employees and applicants for employment notices setting forth the provisions of the nondiscrimination clause.

- B. The contractor will in all solicitations or advertisements for employees placed by or on behalf of the contractor state that all qualified applicants will receive consideration for employment without regard to race, handicap, age, color, religion, sex, or national origin.

- C. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided advising the labor union or workers' representative of the contractor's commitments under the Equal Employment Opportunity section of this contract and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- D. In the event of the contractor's noncompliance with nondiscrimination clauses of this contract or with any such rules, regulations or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further County contracts.
- E. The contractor will include the provisions of this section in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Board of County Commissioners of the County of Durham, North Carolina so that such provisions will be binding such subcontractor or vendor.

A-9. MINORITY and WOMEN BUSINESS ENTERPRISES:

- A. Bidders are required to submit information about participating M/WBEs with their bid. Each bidder shall identify on its bid the minority businesses that it will use on the project and an affidavit listing the good faith efforts it has made pursuant to N.C. Gen. Stat. § 143-128.2(f). The information must include the name and address of each M/WBE, a description of the work to be performed by each, and the dollar value of the work to be performed by each. Any bidder who does not achieve the indicated M/WBE participation goal stated above is required to provide the aforementioned documentation demonstrating that good faith efforts were made in an attempt to meet the established goal. AFFIDAVITS A through D and APPENDIX E, are provided to record this information and must be completed and enclosed with your bid. Any bid which does not include M/WBE information and documentation may be considered non-responsive. The County's Minority and Women Business Enterprise Ordinance may be obtained from the Duham County website at <http://www.dconc.gov> or by contacting the Durham County Purchasing Division.
- B. The apparent lowest responsible, responsive bidder, within three (3) business days, shall also provide either (1) an affidavit (Affidavit C) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal or (2) documentation of its good faith effort that was identified in the bid to meet the goal (Affidavit D), including any advertisements, solicitations, and evidence of other specific actions demonstrating recruitment and selection of minority businesses for participation in the contract. **Failure to file the required affidavit or supporting documentation that demonstrates that the contractor made the required good faith effort is grounds for rejection of the bid.**
- C. M/WBE: A business which is at least 51% owned and controlled by minority group members or a woman. A M/WBE is bona fide only if the minority group or female ownership interests are real and continuing and not created solely to meet the M/WBE requirement. In addition, the M/WBE must itself perform satisfactory work or service or provide supplies under the contract and not act as a conduit. The contractual relationship must be bona fide.

- D. Owned and controlled: (1) A sole proprietorship legitimately owned by an individual who is a minority group member or female; (2) a partnership or joint venture controlled by minorities and/or females; (3) a corporation or other entities controlled by minorities or females, and in which at least 51% of the voting interests and 51% of the beneficial ownership interests are legitimately held by minorities and/or females. These persons must control the management and operations of the business on a day-to-day basis.
- E. A person who is a citizen or lawful permanent resident of the United States and who is:
- a. "Black American"; a person having origins in any of the Black racial groups of Africa;
 - b. "Hispanic American"; a person of Spanish culture with origins in Mexico, Central or South America, or the Caribbean, regardless of race;
 - c. "Native American"; a person who is a member or is eligible to be a member of a federally recognized Indian tribe. A federally recognized Indian tribe means an Indian tribe, or band, nation, rancho, pueblo, colony, or other organized group or community, including any Alaska native village, which is recognized by the Secretary of the Interior on October 1, 1985 as having special rights and is recognized as eligible for service provided by the United States to Indians because of their status as Indians, and any tribe that has a pending application for federal recognition on October 1, 1985, as having special rights and is recognized as eligible for services provided by the United States to Indians because of their status as Indians, and any tribe that has a pending application for Federal recognition on October 1, 1985.
- F. During the construction of a project, if it becomes necessary to replace an M/WBE subcontractor, the prime contractor shall advise the owner. No M/WBE subcontractor may be replaced with a different subcontractor except (1) if the subcontractor's bid is later determined by the contractor to be nonresponsible or nonresponsive, or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work or (2) with the approval of the Board for good cause.
- Good faith efforts as set forth in N.C. Gen. State. § 143-131(b) shall apply to the selection of a substitute subcontractor. Prior to substituting a subcontractor, the contractor shall identify the substitute subcontractor and inform the Board or its designee of its good faith efforts pursuant to N.C. Gen. State. § 143-131(b).
- G. If during the construction of a project additional subcontracting opportunities become available, the prime contractor shall make a good faith effort to solicit subbids from M/WBEs.
- H. Durham Public Schools periodically conducts Construction Information Meetings to engage the business community about current and future project opportunities. Table 1 attached to this Section 00200 includes the list of participants of the most recent Construction Information Meeting. Many of these firms are M/WBE qualified and should be considered as viable participants in the bidding process. Durham Public Schools provides this list as information without endorsing the qualifications or capabilities of these firms or individuals. Bidders are encouraged to contact these

firms and individuals. Bidders are expected to independently evaluate applicability of M/WBE qualifications to the Work described herein and are encouraged to also utilize other reputable resources for M/WBE identification.

A-10. SITE CONDITIONS AND CONDITIONS OF THE WORK:

- A. Each bidder must acquaint himself thoroughly as to the character and nature of the work to be done. Each bidder furthermore must make a careful examination of the site of the work and inform himself fully as to the difficulties to be encountered in the performance of the work, the facilities for delivering, storing and placing materials and equipment, and other conditions relating to construction and labor.
- B. No plea of ignorance of conditions that exist or may hereafter exist on the site of the work, or difficulties that may be encountered in the 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 successful Bidder to fulfill in every detail all the requirements of the Contract Documents and to complete the work or the consideration set forth therein, or as a basis for any claim whatsoever.
- C. Insofar as possible, the Successful Bidder, in carrying out his work, must employ such methods or means as will not cause interruption of or interference with the work of the Owner or any separate contractor.

A-11. BIDDER'S QUESTIONS, ADDENDA AND INTERPRETATIONS:

- A. Bidders and Sub-bidders shall promptly notify the Design Consultant of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding and Contract Documents or of the site and local conditions. No interpretation of the meaning of the drawings, specifications or other contract documents will be made to any Bidder orally.
- B. Every request for such interpretation should be in writing addressed to the Design Consultant with a copy forwarded to the Owner.
- C. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the Bidding Documents which, if issued, will be transmitted to all prospective Bidders (at the respective addresses furnished for such purposes) not later than three calendar days prior to the date fixed for the opening of bids. Neither the Design Consultant nor the Owner will be responsible for any other explanations or interpretations of the proposed documents. Failure of any Bidder to receive any such addendum or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.
- D. Each Bidder shall ascertain prior to submitting his bid that he has received all Addenda issued, and he shall acknowledge receipt and inclusion in his proposal of all Addenda.

A-12. SECURITY FOR FAITHFUL PERFORMANCE:

All bidders shall include in their bid the costs of a Performance Bond and a Labor and Material Payment Bond. The cost of bonds covering the base bid work is to be carried in the base bid only. The cost of bonds covering any alternate scopes of work is to be included within each individual alternate bid. The successful bidder shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum, as security for the payment of all persons performing labor and furnishing materials under this Contract. The successful bidder shall provide a Performance Bond and a Labor and Material Payment Bond using the forms attached as Exhibits A and B. The Performance Bond and the Labor and Material Payment Bond shall be delivered to the Owner not later than the date of execution of the Contract.

A-13. TIME FOR COMPLETION AND LIQUIDATED DAMAGES FOR NON-COMPLETION:

The Substantial Completion date will be March 8, 2024, and Final Completion to be April 5, 2024. In the event of delay in Substantial of Final completion, the Contractor shall pay liquidated damages to DPS in the amount of Two Hundred Fifty (\$250.00) per day.

A-14. LOCATION OF WORK:

The site of the proposed work is on Owner owned property, public streets, easements and/or other right-of-ways, as shown on the drawings.

A-15. LIABILITY INSURANCE AND WORKMEN'S COMPENSATION:

The Successful Bidder will be required to carry public liability and workmen's compensation and other insurance in the amounts and under the terms stipulated under the General Conditions.

A-16. BIDDERS REFERRED TO LAWS:

- A. The attention of Bidders is called to the provisions of all Municipal, County and State laws, regulations, ordinances and resolutions, as well as laws, regulations, ordinance resolutions and permits relating to obstructing streets, maintaining signals, storing and handling of explosives, or affecting the Bidder, or his employees or his work hereunder in his relation to the Owner or any other person. The Bidder shall obey all such laws, regulations, ordinances, permits or resolutions controlling or limiting Contractors while engaged in the prosecution of work under this Contract.
- B. The provisions of this contract shall be interpreted in accordance with the laws of North Carolina and in accordance with the laws, ordinances, regulations, permits and resolutions of Durham County.

A-17. TAXES

All applicable Federal, State and Local Taxes shall be included in the Bidder's proposal. The successful bidder shall provide the Owner with monthly documentation of North Carolina sales taxes paid for all purchases on the project in a form acceptable to the Owner.

DPS has determined this project to be a Capital Improvement as defined by the NC General Statute § 105-164.

A-18. RIGHT TO REJECT BIDS:

The Owner expressly reserves the right to reject any or all bids, to waive any informalities or irregularities in the bids received, and to accept that bid which in its judgment, best serves the interest of the Owner.

A-19. EQUAL PRODUCTS AND SUBSTITUTIONS:

- A. Whenever possible, the Design Consultant shall specify in the plans the required performance and design characteristics for materials as required by N.C. Gen. Stat. § 133-3. When it is impossible or impractical to specify the required performance and design characteristics for materials, the Design Consultant may use a certain brand, make, manufacturer, article, device, product, material, fixture, form or type construction by name, make or catalog number to convey the general style, type, character and standard of quality of the article desired. Unless specifically stated to the contrary, all materials, supplies and articles furnished under this Contract shall, whenever specified and otherwise practicable, be the standard products of recognized, reputable manufacturers. Unless otherwise specifically provided in the Contract Documents, the naming of a certain brand, make, manufacturer or article, device, product, material, fixture or type of construction shall convey the general style, type, character and standard of quality of the article desired and shall not be construed as limiting competition. If approval by the Design Consultant prior to bid opening is desired, the bidder shall request approval in writing at least ten (10) days prior to the bid date. The Design Consultant's approval will be in the form of an Addendum to the Specifications issued to all prospective Bidders indicating that the additional makes or brands are equivalent to those specified. Nothing in this paragraph is intended to restrict or inhibit free and open competition on school system projects.
- B. The bidder may request approval for substitutions of materials or type of construction in writing up to ten (10) days prior to the bid date. The standard for acceptance of substitutions shall be as expressed in Paragraph 4.15 of the contract General Conditions.

A-20. PREPARATION AND SUBMITTAL OF FORM OF BID:

- A. Bids shall be submitted utilizing the Form of Proposal as bound herein, or otherwise provided with the Contract Documents, and shall be complete in every respect. The total bid amount shall be entered in words and figures in the space provided. Where applicable, the unit price or lump sum items, and their extensions, shall be entered in figures in the respective columns provided for each bid item. All entries shall be typewritten or printed in ink. The signatures of all persons shall be in longhand. Any entry of amount that appears on the face of the bid to have involved an erasure, deletion, white-out and/or substitution or other such change or alteration, shall show by them the initials of the person signing the bid and the date of the change or alteration. A failure to comply with this requirement may be cause for disqualification of the bid.

- B. For Unit Price bids, in the event of any discrepancies between the unit prices and the extensions thereof or the total bid amount, the unit prices shall govern. For Lump Sum bids, in the event of a discrepancy between the bid amount in writing and that in figures, the written value shall govern.
- C. Bids shall not contain any restatement or qualifications of work to be done, and alternate bids will not be considered unless called for. No oral bids or modifications will be considered.
- D. The amount of a bid submitted by a subcontractor to the general contractor under the single prime contracting system shall not exceed the bid, if any, for the same work by that subcontractor to the Owner under the multiple prime system.
- E. Each single-prime bid shall identify the contractors selected to perform the HVAC, plumbing and electrical work and the subcontractors' respective bid prices for the work.

A-21. MODIFICATION OR WITHDRAWAL OF BID:

- A. A Bidder may withdraw his bid from consideration if such bid was based upon a mistake as provided in North Carolina General Statute 143-129.1.
- B. Prior to the time and date designated for receipt of bids, any bid submitted may be modified or withdrawn by notice to the party receiving bids at the place designated for receipt of bids. Such notice shall be in writing over the signature of the Bidder or by telegrams; if by telegram, written confirmation over the signature of the Bidder shall be mailed and postmarked on or before the date and time set for receipt of bids, and it shall be so worded as not to reveal the amount of the original bid.
- C. Withdrawn bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with this Information for Bidders.
- D. Bid security, if any is required, shall be in an amount sufficient for the bid as modified or resubmitted.

A-22. DETAILED BID BREAKDOWN:

If the Owner directs, the Bidder shall provide a detailed breakdown of his bid acceptable to the Owner. In addition to verifying accounting requirements, the breakdown may be used by the Owner to determine whether the Bidder has grossly misjudged the requirements of any area. Failure to provide the requested detailed breakdown may result in rejection of the bid proposal.

A-23. AWARD OF CONTRACT:

- A. The contract will be awarded to the lowest responsive and responsible bidder under the single prime system, taking into consideration quality, performance, and the time specified in the bids for the performance of the contract.
- B. The lowest bidder shall be determined by the aggregate amount of the unit prices set forth in the form of bid, if work is bid on a unit price basis, or the aggregate

amount of the Base Bid, plus any Alternates selected by the Owner. Single prime bids will be received and awarded according to state law.

- C. A Responsive Bidder shall mean a Bidder who has submitted a bid which conforms, in all material respects, to the Bidding Documents.
- D. 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. Whether the bidder can 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 performance of previous contracts or services. For example the following information will be considered:
 - a. the administrative and consultant cost overruns incurred by Owners on previous contracts with Bidder,
 - b. the Bidder's compliance record with contract general conditions on other projects,
 - c. the submittal by the bidder of excessive and/or unsubstantiated extra cost proposals and claims on other projects,
 - d. the Bidder's record for completion of the work within the Contract Time or within Contract Milestones and Bidders compliance with scheduling and coordination requirements on other projects,
 - e. the Bidder's demonstrated cooperation with the Owner or the Design Consultant and other contractors on previous contracts,
 - f. whether the work performed and materials furnished on previous contracts was in accordance with the Contract Documents;
 - 5. The previous and existing compliance by the bidder with laws and ordinances relating to contracts or services;
 - 6. The sufficiency of 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. The ability of the Bidder to provide future maintenance and service for the warranty period of the contract;
 - 9. Whether the Bidder is in arrears to the Owner on debt or contract or is a defaulter on surety to the Owner;
 - 10. Whether the bidder has demonstrated a good faith effort to use M/WBEs as subcontractors;

11. Such other information as may be secured by the Owner having a bearing on the decision to award the contract, to include, but not limited to:
 - a. the ability, experience and commitment of the Bidder to properly and reasonably plan, schedule, coordinate and execute the Work,
 - b. whether the Bidder has ever been debarred from bidding or found ineligible for bidding on any other projects.
- F. The purpose of the above is to enable the Owner in its opinion, to select the lowest responsible bidder. The ability of the low Bidder to provide the required bonds will not of itself demonstrate responsibility of the Bidder.
- G. In addition to the qualifications package submitted with the bid, the Owner reserves the right to require from the Bidder: (1) submissions of additional references, within seven days of bid opening, to include a listing of previous and current projects and (2) financial statements indicating current financial status, prepared in accordance with generally accepted accounting principles, by a CPA licensed to do business in North Carolina, and (3) any other information deemed necessary in order to establish the responsiveness and responsibility of the bidder.
- H. The Owner reserves the right to defer award of this contract for a period of Sixty (60) days after the due date of bids. During this period time, the Bidder shall guarantee the prices quoted in his bid.

A-24. ADDITIONAL REQUIREMENTS:

- A. All bidders must complete the Vendor Application/Bidder Profile Form and include it with their bid package. This information will be used to create or update Durham County's electronic Bidder/Vendor files.
- B. Security of Non-public Records: Pursuant to N.C.G.S. § 132-1.7, entitled, "Sensitive Public Security Information", public records, as defined in G.S. 132-1, shall not include information containing specific details of public security plans and arrangements or the detailed plans and drawings of public buildings and infrastructure facilities. Therefore, all information provided, received, gathered or obtained by Bidder containing specific details of public security plans and arrangements or the detailed plans and drawings of public buildings and infrastructure facilities shall be held confidential and shall be used by the Bidder only for the purpose of responding to this bid. All plans and drawings shall be returned to the Owner no later than the bid closing date. Any breach of this paragraph by the Bidder may result in Bidder being barred from being awarded any contracts with the Owner.
- C. To ensure a fair bidding process, questions and/or clarifications requested by contractors will be accepted up to **seven (7) days prior to Bid Opening**. Bidders/contractors are required to submit their questions in writing to the Designer, Johnny Wood, PE, jwood@dewberry.com, 919.215.2010
- D. The following forms must be returned:
 - a. Bid Forms
 - b. Non-Collusion Affidavit

- c. Bid Bond
 - d. Power of Attorney
 - e. Vendor Application and W-9 Form
 - f. M/WBE Forms:
 - i. Identification of Minority Business Participation with contract amounts (\$),
- AND -
 - ii. Affidavit A – Listing of Good Faith Efforts **- OR -**
 - iii. Affidavit B – Intent to Perform Contract with Own Workforce
 - g. Statement of Qualifications
- E. Following the bid opening, the Owner will issue a Determination of Apparent Low letter to the contractor it has deemed to be the apparent low responsible, responsive bidder based on the initial bid documentation. The contractor is required to submit Affidavit C or D including all statute-required back-up information within seventy-two (72) hours of the receipt of the letter.
- F. Within 14 calendar days of the contract award, the contractor shall submit a complete list of all identified subcontractors the contractor will use on the project.
- G. **ASBESTOS-CONTAINING BUILDING MATERIALS IN SCHOOL FACILITIES:**Asbestos-containing building materials must not be disturbed if encountered during repairs, renovations, and other construction and installation activities. If disturbance of these materials cannot be reasonably avoided, no work shall begin until Durham Public School System has been notified and has issued specific instructions on the proper procedures for the activity in accordance with federal, state and local regulation. If Asbestos is identified DPS shall perform asbestos and lead based paint surveys of the affected areas of the facility.

H.

RELATED SECTIONS:

- A. Exhibit A – Performance Bond Form (Section 00 61 13)
- B. Exhibit B – Material and Labor Payment Bond Form (Section 00 61 13)

END OF INFORMATION FOR BIDDERS

Contract: **Single Prime**

Project: **Lakeview School Controls Replacement**
Durham Public Schools Board of Education
Durham County, NC

Bidder: _____

Date: _____

The undersigned, as bidder, hereby declares that the only person or persons interested in this proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The Bidder further declares that he has examined the site of the work and the contract documents relative thereto, has read all special and supplemental provisions furnished prior to the opening of bids, has satisfied himself relative to the work to be performed, and thereby proposes and agrees if this proposal is accepted, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the fabrication and delivery of the work, and other related work in full and complete accordance with the plans, specifications and contract documents, to the full and entire satisfaction of the Owner, with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and other contract documents, on the **DPS Lakeview School Controls Replacement Project in Durham, NC**

Bidders are advised that a notice to proceed may be issued upon approval by the Durham Public Schools Board of Education, and in advance of the contract document.

The Bidder proposes and agrees, if this proposal is accepted, to execute a Contract within ten (10) days after notification of award, for the above work and for the below stated Compensation, in the form of Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum., for the sum of:

BASE BID: _____

_____ Dollars (\$ _____)

Mechanical Subcontractor:

_____ Sub Bid Amount (\$ _____)

Electrical Subcontractor:

_____ Sub Bid Amount (\$ _____)

ALTERNATES:

The Bidder proposes to perform the work indicated as alternates for the amounts entered below, which amounts shall be added to or deducted from the Base Bid as indicated in the space below. (Bidders must enter an amount for each alternate. If acceptance of the alternate will not change the contract amount, enter “No Change”. Insert the words “Add” or “Deduct” in the space provided before the amount.)

List of Alternates:	<u>Add/Deduct</u>	<u>Amount</u>
Alternate #1: Manufacturer Preferred Brand of BAS: Distech	_____	\$ _____

BID UNIT PRICES:

NONE

ADDENDA:

The following addenda were received and used in computing this bid:

	Date	Initial
Addendum #1	_____	_____
Addendum #2	_____	_____
Addendum #3	_____	_____
Addendum #4	_____	_____

The Bidder further proposes and agrees hereby to commence work under this contract on a date to be specified in a written order by the Owner or Designer on or before **May 1, 2023**, and shall substantially complete the work on or before **September 14, 2023 (136 calendar days)** from the “Notice to Proceed” or the contract, whichever is dated first.

The undersigned further agrees that in the case of failure on his part to execute the said contract and the bond within ten (10) consecutive calendar days after written notice being given of the award of the contract, the certified check, cash or bid bond accompanying this bid shall be paid into the funds of the Owner’s account set aside for the project, as liquidated damages for such failure; otherwise the certified check, cash or bid bond accompanying this proposal shall be returned to the undersigned. Attach certified check, cash or bid bond to this proposal.

BID FORM Section 00 41 13.02

Contractor Initials & Date _____

RESPECTFULLY SUBMITTED this _____ day of _____, 200__.

(Name of firm or corporation making bid)

By: _____

Title: _____
(Owner / Partner / President / Vice President)

License No. _____

Federal ID No. _____

WITNESS: (Proprietorship / Partnership)

By: _____

ATTEST: (Corporation)

By: _____

(CORPORATE SEAL)

Title: _____
(Corporate Secretary or Asst. Secretary Only)



Vendor Application

IT IS CRITICAL TO THE COUNTY OF DURHAM THAT YOU COMPLETE ALL DATA - PLEASE PRINT OR TYPE
(A W-9 FORM IS REQUIRED AND MUST BE SUBMITTED WITH THIS FORM)

1. Vendor Name: _____

Do you require a 1099? Yes ___ No ___

2. Mailing address for payments: _____

3 Mailing address for purchase orders, proposals and bids: _____

4. Contact Person _____ Phone #: _____
Fax #: _____

5. In what City and State is your firm licensed? _____
If licensed in NC, indicate County (for tax purposes) _____

6. Indicate your firm's organizational type:
Individual ___ Partnership ___ Corporation ___ Governmental Agency ___ Other _____

7. Is your firm a large business? Yes ___ No ___ 8. Is your firm a small business? Yes ___ No ___

9. Is your firm 51 percent or more owned and operated by a woman? Yes ___ No ___
If yes, with what governmental agencies are you certified? _____

10. Is your firm 51 percent or more owned and operated by a minority? Yes ___ No ___
If yes, with what governmental agencies are you certified? _____
Identify appropriate minority group:

Black American ___ Native American ___ Hispanic ___ Asian/Pacific ___ Asian Indian ___

11. Is your firm incorporated? Yes ___ No ___

12. Is your firm a not-for-profit concern? Yes ___ No ___

13. Is your firm a handicapped business concern? Yes ___ No ___

14. Give a brief description of goods or services your firm provides:

Signature: _____ Title: _____

Print name: _____ Date: _____

If you have any questions concerning this form, call Durham County Business Development Manager (919) 560-0051

Return to: County of Durham Purchasing Div. or Fax to : (919) 560-0057
200 E Main St 4th Floor
Durham, NC 27701

Rev 02/06

**Request for Taxpayer
Identification Number and Certification**

**Give form to the
requester. Do not
send to the IRS.**

Print or type See Specific Instructions on page 2.	Name (as shown on your income tax return)	
	Business name, if different from above	
	Check appropriate box: <input type="checkbox"/> Individual/Sole proprietor <input type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ▶ <input type="checkbox"/> Exempt payee <input type="checkbox"/> Other (see instructions) ▶	
	Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
	City, state, and ZIP code	
	List account number(s) here (optional)	

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number
or
Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here	Signature of U.S. person ▶	Date ▶
------------------	----------------------------	--------

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

- The U.S. grantor or other owner of a grantor trust and not the trust, and
- The U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person, do not use Form W-9. Instead, use the appropriate Form W-8 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a “saving clause.” Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called “backup withholding.” Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),
3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the instructions below and the separate Instructions for the Requester of Form W-9.

Also see *Special rules for partnerships* on page 1.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name

If you are an individual, you must generally enter the name shown on your income tax return. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first, and then circle, the name of the person or entity whose number you entered in Part I of the form.

Sole proprietor. Enter your individual name as shown on your income tax return on the “Name” line. You may enter your business, trade, or “doing business as (DBA)” name on the “Business name” line.

Limited liability company (LLC). Check the “Limited liability company” box only and enter the appropriate code for the tax classification (“D” for disregarded entity, “C” for corporation, “P” for partnership) in the space provided.

For a single-member LLC (including a foreign LLC with a domestic owner) that is disregarded as an entity separate from its owner under Regulations section 301.7701-3, enter the owner’s name on the “Name” line. Enter the LLC’s name on the “Business name” line.

For an LLC classified as a partnership or a corporation, enter the LLC’s name on the “Name” line and any business, trade, or DBA name on the “Business name” line.

Other entities. Enter your business name as shown on required federal tax documents on the “Name” line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the “Business name” line.

Note. You are requested to check the appropriate box for your status (individual/sole proprietor, corporation, etc.).

Exempt Payee

If you are exempt from backup withholding, enter your name as described above and check the appropriate box for your status, then check the “Exempt payee” box in the line following the business name, sign and date the form.

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

The following payees are exempt from backup withholding:

1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2),
2. The United States or any of its agencies or instrumentalities,
3. A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities,
4. A foreign government or any of its political subdivisions, agencies, or instrumentalities, or
5. An international organization or any of its agencies or instrumentalities.

Other payees that may be exempt from backup withholding include:

6. A corporation,
7. A foreign central bank of issue,
8. A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States,
9. A futures commission merchant registered with the Commodity Futures Trading Commission,
10. A real estate investment trust,
11. An entity registered at all times during the tax year under the Investment Company Act of 1940,
12. A common trust fund operated by a bank under section 584(a),
13. A financial institution,
14. A middleman known in the investment community as a nominee or custodian, or
15. A trust exempt from tax under section 664 or described in section 4947.

The chart below shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 15.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 9
Broker transactions	Exempt payees 1 through 13. Also, a person registered under the Investment Advisers Act of 1940 who regularly acts as a broker
Barter exchange transactions and patronage dividends	Exempt payees 1 through 5
Payments over \$600 required to be reported and direct sales over \$5,000 ¹	Generally, exempt payees 1 through 7

¹ See Form 1099-MISC, Miscellaneous Income, and its instructions.

² However, the following payments made to a corporation (including gross proceeds paid to an attorney under section 6045(f), even if the attorney is a corporation) and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, and payments for services paid by a federal executive agency.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited liability company (LLC)* on page 2), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office or get this form online at www.ssa.gov. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at www.irs.gov/businesses and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting www.irs.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, and 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). Exempt payees, see *Exempt Payee* on page 2.

Signature requirements. Complete the certification as indicated in 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, social security number (SSN), or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

Call the IRS at 1-800-829-1040 if you think your identity has been used inappropriately for tax purposes.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS personal property to the Treasury Inspector General for Tax Administration at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: spam@uce.gov or contact them at www.consumer.gov/idtheft or 1-877-IDTHEFT(438-4338).

Visit the IRS website at www.irs.gov to learn more about identity theft and how to reduce your risk.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account ¹
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor ²
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee ¹
b. So-called trust account that is not a legal or valid trust under state law	The actual owner ¹
5. Sole proprietorship or disregarded entity owned by an individual	The owner ³
For this type of account:	Give name and EIN of:
6. Disregarded entity not owned by an individual	The owner
7. A valid trust, estate, or pension trust	Legal entity ⁴
8. Corporate or LLC electing corporate status on Form 8832	The corporation
9. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
10. Partnership or multi-member LLC	The partnership
11. A broker or registered nominee	The broker or nominee
12. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity

¹ List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

² Circle the minor's name and furnish the minor's SSN.

³ You must show your individual name and you may also enter your business or "DBA" name on the second name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

⁴ List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 1.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA, or Archer MSA or HSA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. The IRS may also provide this information to the Department of Justice for civil and criminal litigation, and to cities, states, the District of Columbia, and U.S. possessions to carry out their tax laws. We may also disclose this information to other countries under a tax treaty, to federal and state agencies to enforce federal nontax criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism.

You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold 28% of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.

BID BOND FORM Section 00 43 13

KNOW ALL MEN BY THESE PRESENTS, That we,

(Bidder's Name)

_____, of _____
(Street Address) (City, State, Zip)

Hereinafter called the Principal, and

(Surety's Name)

A corporation organized and existing under the Laws of the State of _____, and authorized to transact business in the State of _____, as Surety, hereinafter called Surety, are held and firmly bound unto the _____ (Owner).

Hereinafter called Obligee, in the Penal sum of five percent (5%) of the amount bid, good and lawful money of the United States of America, for the payment of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The Condition of this Obligation is such, that, WHEREAS the Principal has submitted a proposal to the Obligee on a contract for the construction

of _____
(Contract Name and Number)

NOW THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the Bidding or Contract Documents with good and sufficient surety for the faithful performance of such construction for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void; otherwise to remain in full force and effect.

BID BOND FORM Section 00 43 13

In witness whereof, we have hereunto set our signatures and seal this _____ day of _____, 20_____, all pursuant to due authorization.

Principal (Seal)

By
Surety

By
Attorney-in-Fact in accordance with the attached Power of Attorney

STATE OF _____)

ss:

COUNTY OF _____)

I, _____, a Notary Public in and for the State and County aforesaid, do hereby certify that _____, and _____, whose names are signed to the foregoing bond, this day personally appeared before me in my State and County aforesaid and acknowledged the same.

Given under my hand seal this _____ day of _____, 19_____.

Notary Public (Seal)

My Commission expires:

BID PACKET REQUIREMENTS

Bid envelopes will have the following information on the outside of the envelope:

Bidder's name
Bidder's NC License Number
Bidder's Address

Proposal for Construction Contract for
Lakeview School Controls Replacement
DPS Project #: 341-03

Addressed to: Durham Public Schools
ATTN: Purchasing
511 Cleveland St.
Durham, NC 27702

The following completed documents will be required in your base bid package:

1. Form of Proposal – Single Prime Contract
 - a. NOTE: Part 5, Addenda Acknowledgment **must** be filled out with the correct number of Addenda's Issued before bid date.
2. Non-Collusion Affidavit
3. Bid Bond
4. Bid Bond Power of Attorney
5. Vendor Application and W-9 Form
6. M/WBE Forms
 - a. Identification of Minority Business Participation – **AND** –
 - b. Affidavit A – Listing of Good Faith Efforts – **OR** –
 - c. Affidavit B – Intent to Perform Contract with Own Workforce
7. Statement of Qualifications
8. Statement of workload and staffing

The omission of any of the above forms will constitute the bid as invalid and the contractors bid amount will not be read.

Tax Clarification, Reference "Information For Bidders" Section A-17, "All applicable Federal, State and Local Taxes shall be included in the Bidder's proposal".

Affidavit C or D will be submitted only by the apparent lowest responsible, responsive bidder within seventy-two (72) hours after the bid closing date.

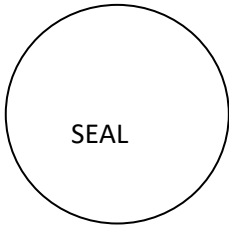
AFFIDAVIT OF E-VERIFICATON

The undersigned hereby certifies on behalf of _____
 (“Bidder”) that Bidder and its proposed Subcontractors for this project are in compliance with
 Article 2 of Chapter 64 of the North Carolina General Statutes, except for those with less than
 twenty five (25) employees that are exempt from the E-Verification requirements.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of North Carolina, County of _____

Subscribed and sworn to before me this _____ day of _____ 20____

Notary Public _____

My commission expires _____

NON-COLLUSION AFFIDAVIT

State of North Carolina
County of Durham

I _____, being first duly sworn, deposes and says that:

1. He/She is the _____ of _____, the offeror that has submitted the attached proposal;
2. He / She is fully informed respecting the preparation and contents of the attached proposal and of all pertinent circumstances respecting such proposal;
3. Such proposal is genuine and is not a **collusive** or **sham** proposal;
4. Neither the said offeror nor any of its officers, partners, owners agents, representatives, employees or parties of interest, including this affidavit, has in any way colluded, conspired, connived or agreed, directly or indirectly, with any other offeror, firm or person to submit a **collusive** or **sham** proposal in connection with the contract for which the attached proposal has been submitted or to refrain from proposaling in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other offeror, firm or person to fix the price or prices in the attached proposal or of any other offeror, or to fix any overhead, profit or cost element of the proposal price of any other offeror or to secure through collusion, conspiracy, connivance or unlawful agreement any advantage against the County of Durham or any person interested in the proposed contract; and
5. The price or prices quoted in the attached proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the offeror or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit.

Signature of offeror

Date

Subscribed and sworn before me,
this _____ day of _____, 20_____

(SEAL)

TITLE

Notary Public
My Commission Expires _____

ARTICLE V. - MINORITY AND WOMEN BUSINESS ENTERPRISES (as of February 18, 2020)

Sec. 8-131. - Purpose.

- (a) The county has commissioned a disparity study, which determined that there is a strong basis in evidence to conclude that minority and women-owned firms continue to suffer from both discrimination and the present effects of past discrimination in the Durham marketplace, which have a direct affect on the procurement processes of the County of Durham. The study findings conclude that the county should utilize race-neutral remedies to address the identified discriminatory barriers faced by minority and women-owned businesses and further concludes that, where appropriate, the county should take action to ensure that minority and women-owned firms are not discriminated against.
- (b) This article establishes a plan of action to help ensure that the county's purchasing practices provide for participation by, and equal opportunities for businesses owned and controlled by minorities and women.
- (c) This article is enacted pursuant to authority provided by law, including G.S. 143-128, 153A-12, 153A-13, 153A-121, and 153A-134.

(Ord. of 1-14-08(1), § 1)

Sec. 8-132. - Policy statement.

It is the policy of the county to provide minorities and women equal opportunity to participate in all aspects of the county's contracting programs, including, but not limited to, construction projects, and/or materials and service contracts, consistent with law. It is further the policy of the county to prohibit discrimination against any business in pursuit of these opportunities on the basis of race, color, national origin, religion, sex, age, disability, or veteran's status. It is further the policy of the county to conduct its contracting programs so as to prevent such discrimination, correct present discrimination and to resolve claims of such discrimination.

(Ord. of 1-14-08(1), § 1)

Sec. 8-133. - Definitions.

Unless the context requires otherwise, the following words as used in this article have the indicated meanings:

To *bid* means to offer to furnish goods or services. Bids are the means by which the offer is communicated and includes, but is not limited to, formal and informal bids, proposals, and responses to a request for proposals. A bid need not be in writing, unless otherwise required.

Bidder means a business which has bid to provide goods or services to the county.

Business includes businesses regardless of legal status, including persons, corporations, partnerships, joint stock companies, joint ventures and any other private legal entity.

Contractor means a business which has a contract with the county to provide goods or services to the county.

County means County of Durham, North Carolina.

County manager means the Durham County Manager or the county manager's designee.

Department head means the Durham County Department Head or the designee of the department head, such as the project manager.

Director means the Durham County Purchasing Director or the designee of the director.

Goals means M/WBE goals expressed as a percentage of the total dollar volume for participation of minorities and women on county contracts.

Goods mean apparatus, supplies, materials and equipment.

Historically underutilized business means a business which meets the conditions specified in G.S. 143-128.4(a).

Joint venture means an association of two or more businesses to carry out a single enterprise for profit, for which purpose they combine their property, capital, efforts, skills, or knowledge.

MBE means an M/WBE which is a minority business enterprise, which includes minority or women business enterprise.

M/WBE means a business which holds a current certification as a minority or women business enterprise.

Minority means an individual who is a citizen or lawful permanent resident of the United States and who is:

- (1) *African American*. A person having origins in any of the black racial groups of Africa.
- (2) *Asian American*. A person having origins in any of the original peoples of the Far East, Southeast Asia, Asia, Indian continent, or Pacific Islands.
- (3) *Hispanic American*. A person of Spanish or Portuguese culture having origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race.
- (4) *Native American*. A person having origins in any of the original Indian peoples of North America.

Other professional means professional services other than architecture, engineering, or professional services performed for the human services agencies of the county.

Services mean nonconstruction services.

Subcontractor means any business contracting with a contractor to provide goods and/or services in fulfillment of the contractor's obligations arising from a contract with the county.

WBE means an M/WBE which is a woman-owned business enterprise.

(Ord. of 1-14-08(1), § 1)

Sec. 8-134. - Administration.

- (a) The county manager, with the advice of the director, shall implement this article. The county manager is hereby authorized to take all usual and legal administrative actions necessary to implement this article.
- (b) This article applies to all bids and contracts for the purchase of goods or services which the county enters into after the adoption hereof.
- (c) The county manager and the director shall consider and implement special programs to assist local M/WBEs including, but not limited to, bonding assistance and technical assistance.

(Ord. of 1-14-08(1), § 1)

Sec. 8-135. - Encouragement of M/WBE contracting.

- (a) *Race-neutral steps*. The county shall take the following race-neutral steps to attempt to eliminate discrimination which has been shown to exist.

- (1) *Creation and identification of separate work.* In the preparation of bid request packages and in projects in which the county engages an independent architect or engineer, the director and department head shall make reasonable attempts to divide the work requirements so that there are good opportunities for small companies to perform as subcontractors. This may be accomplished, for example, by the director and department head working together to identify contracting strategies which ensure that opportunities are created for smaller firms.
 - (2) *Advertising for bids.* Whenever the county manager finds it to be reasonably practicable, a period of at least 30 days will be given between advertising and receiving bids so that small companies may have adequate time to obtain bonding, licensing, or any other technical assistance. Further, such advertising shall be made through the majority and minority media as well as through majority and minority trade and professional organizations and publications.
 - (3) *Pre-bid conference.* The director shall be present at each pre-bid conference. The director shall provide potential subcontractors with a list of contractors who attend the pre-bid and pre-proposal meetings.
 - (4) *Bonding, etc.* The county manager shall, where applicable and feasible, make efforts to assist companies in obtaining bonding. Bonding and other technical assistance shall be coordinated with the United States Small Business Administration, other governmental entities and, where feasible, financial institutions.
 - (5) *[System development.]* The director shall develop a system to make available information on current informal bids via internet access or electronic mail.
 - (6) *Other requirements.* The director shall insert, in contracts to be executed by the county, provisions requiring the other parties to adhere to the requirements of this article.
- (b) *Race-conscious steps.* The county shall take the following race-conscious steps to attempt to eliminate discrimination which has been shown to exist:
- (1) *Maintaining M/WBE availability data bank.* The county shall utilize the statewide data bank of historically underutilized businesses, established by the North Carolina Department of Administration HUB Office. This information is to be made available to all prospective contractors and shall be used by the county in notifying M/WBEs of opportunities to contract with the county. The director shall utilize electronic technology to the greatest extent practicable to maintain information on certified historically underutilized businesses which seek to do business with the county. The information should include at least the following: name of business, address, telephone number, services or products provided, capabilities of the business, line of work performed by the business, licensing and number of persons employed by ethnicity and gender.
 - (2) *Outreach and assistance to subcontractors.* To ensure that opportunities to participate on county contracts are available to the widest feasible universe of interested, available and qualified businesses, the county shall develop and implement a written comprehensive outreach program aimed at increasing business participation in the county's contracting and procurement process. This program may include, without limitation, any or all of the following:
 - a. The county may disseminate at community events, trade shows, and other appropriate business functions, and publish at regular intervals, in print and in electronic media (including publications or electronic media targeted to MWBEs and small businesses) information describing the minority business opportunity program and the functions of the county.
 - b. The county may establish a procedure to engage in continuous recruitment and outreach efforts directed at business assistance organizations to increase the pool of businesses available to do business with the county. The county may identify suppliers through business development organizations and participation at various trade shows, supplier diversity groups and work with various national and local supplier development councils and organizations.

- c. The county may disseminate at community events, trade shows, and other appropriate business functions, and publish at regular intervals, in print and in electronic media, information identifying ongoing contracting opportunities with the county, and providing contact information by which businesses may obtain additional information from the county. The county will provide this information in languages other than English, where appropriate. To the extent feasible, the county may enter into arrangements to share data regarding upcoming county projects, and subcontracting opportunities on the projects, with other businesses and agencies or jurisdictions in the region.
 - d. The county may assist businesses in submitting bids for eligible projects by providing individualized counseling, and/or by conducting seminars regarding the process for submitting a bid on a county project. The county may sponsor "How to do business with the County of Durham" seminars and invite a wide array of businesses.
 - e. The county may actively encourage businesses to attend the pre-bid conferences, providing face-to-face and one-on-one meeting opportunities with employees of the county within the divisions and departments that are involved with the contracting and procurement process. The county may establish and implement training and awareness programs with the employees of the county's user departments to educate them with regard to increasing utilization of MWBEs.
- (c) *Bidders' responsibilities.* Bidders shall take affirmative steps prior to submission of any bid to encourage participation in projects by M/WBEs where discrimination has been shown to currently exist. Such steps shall include:
- (1) Segmenting total work requirements to permit M/WBE participation.
 - (2) Assuring that M/WBEs are solicited whenever there are possible sources of goods or services. This may include:
 - a. Sending letters or making other personal contacts with M/WBEs (e.g. those whose names appear on the historically underutilized businesses listed in the North Carolina State-Wide Data Bank). M/WBEs are to be contacted within a reasonable time prior to bid submission or the closing date of receipt of initial offers. Those letters or other contacts shall communicate the following:
 - 1. A specific and accurate description of the work to be subcontracted;
 - 2. Information on how and where to obtain a copy of this article and specification or other detailed price quotation;
 - 3. The date the quotation is due to the bidder for preparation of the bid; and
 - 4. The name, address and phone number of the person in the bidder's business whom the prospective M/WBE subcontractor should contact for additional information.
 - b. Sending letters or making other personal contacts, as referenced in subsection 8-135(b)(2)a., with local state, federal, and private agencies and M/WBE associations relevant to the project. Such contacts should provide the same information as provided in the direct contact with M/WBEs.
 - c. Where feasible, establishing delivery schedules which will encourage participation by M/WBEs.
 - d. In determining the availability of M/WBEs, the relevant area shall be the same as that used to solicit bidders.
 - (3) Attending the pre-bid conference, if such a conference is held.
 - (4) Advertising in minority/female trade publications and minority/female-owned media no less than 20 days from the date that bids are due. If 20 days are not available, advertising must be sought as soon as the bidder learns of the solicitation of bids. The publication should be one which

reasonably covers the area used to solicit the bidder. The advertisement should be for specific subcontracts described in reasonable detail.

- (5) The advertised subcontracts should equal the M/WBE goal specified in the bid.
 - (6) Assisting M/WBEs in finding sources of bonding and insurance required by the bidder.
 - (7) Not imposing requirements regarding surety bonds that are more onerous for M/WBEs than for non-M/WBEs similarly situated.
 - (8) Making all reasonable efforts to provide technical assistance to assist in the upgrading of M/WBE capabilities.
 - (9) Making bulk purchases whenever reasonably practicable in order to reduce the capital requirements of M/WBE subcontractors.
 - (10) Reporting all businesses which it has reasonable grounds to believe have fraudulently claimed M/WBE status in order to unjustly benefit from the requirements of this article.
 - (11) To demonstrate compliance with the responsibilities as set forth herein, bidders shall keep detailed records of all correspondence with M/WBEs and the responses thereto, logs of all telephone calls made and received regarding the project and copies of advertisements in minority and women-owned publications and media.
- (d) *Responsibilities of bidders and contractors.* Bidders and contractors shall:
- (1) Furnish regular reports and information, in a form determined by the director (Appendix E, M/WBE Documentation for Contract Payments) sufficient to allow the county and the director to determine that the bidders and contractors are meeting the requirements of this article. This information must be submitted by the contractor to the county department head or designee, with each pay request.
 - (2) Cooperate in good faith with the county to attempt to resolve any complaints of discrimination made against bidders and contractors.
 - (3) After the county manager has identified a bidder as the apparent lowest responsible bidder, whether as a result of a sealed bid process or otherwise, and that bidder proposes to replace a subcontractor, to increase the quantity of subcontracted work, or to change the allocation of work among subcontractors, the bidder must provide M/WBEs an equal opportunity for such work. Substitutions of subcontractors in these circumstances, both prior to and after the awarding of a contract, are subject to the written approval by the county manager.
 - (4) When a contractor proposes to replace subcontractors, to increase the quantity of subcontracted work, or to change the allocation of work among subcontractors, the contractor must provide M/WBEs an equal opportunity for such work. Substitutions of subcontractors in these circumstances are subject to the written approval of the county manager.
- (e) *Obligations of M/WBEs.* M/WBEs and businesses that qualify to be certified as M/WBEs are responsible for promoting themselves and taking the initiative to obtain contracts and subcontracts, and for encouraging joint venture arrangements. M/WBE's interested in special assistance shall take the following steps:
- (1) Submit information to the contract recipients to identify status as an MBE or WBE.
 - (2) Become certified as an MBE or WBE under the North Carolina Department of Administration, Historically Underutilized Business (HUB) certification program.
 - (3) Contact federal, state, and local M/WBE liaison offices to obtain information on potential jobs.
 - (4) Provide capability statements to state agencies, the director, county engineer, and prospective bidders stating types of work performed by the business, size of job that the business could handle, bonding information and any special skills.

- (5) Make every effort to establish contacts and relationships with prospective bidders for potential future business, including attending pre-bid conferences and subscribing to industry and trade journals.
- (6) Contact the county's engineering department to obtain information on planned projects. Visit the Durham County website periodically for posting of bid opportunities.
- (7) Respond promptly to solicitation requests.
- (8) Attend seminars, classes, and workshops designed to enhance business skills and the ability to build capacity.

(Ord. of 1-14-08(1), § 1)

Sec. 8-136. - Goals.

- (a) In determining the value of contracts awarded to MBEs and WBEs as required by this section, contracts and subcontracts are deemed awarded if the bidder lists them in the paperwork required by the director as part of the county's bid process. Durham County hereby establishes the following goals for the expenditure of funds with M/WBEs:

Ethnicity/Race/Gender Industry	African American	Asian American	Hispanic American	Native American	Women-Owned
Construction	2.61%	N/A	N/A	N/A	3.98%
Construction subcontracting	14.67%	N/A	2.14%	N/A	10.76%
Professional services (including architecture and engineering)	N/A	N/A	N/A	N/A	N/A
Other professional services	7.20%	N/A	N/A	N/A	3.55%
Goods/supplies	N/A	N/A	N/A	N/A	12.05%

- (b) The county manager may waive the required goals subject to the availability of qualified firms. The county reserves the right to set goals on a project-by-project basis depending on the availability of qualified firms.

(Ord. of 1-14-08(1), § 1)

Sec. 8-137. - Certification of M/WBEs.

- (a) Minority businesses seeking to be counted toward Durham County's minority business participation goals shall be certified or designated as minority business by the North Carolina Department of Administration HUB Office, or by another certifying agency of the State of North Carolina or local unit of government.

- (b) As a result of North Carolina's Legislative Session Law 2007, Senate Bill 320, a new requirement has been created for the state department of administration to develop and administer a state-wide uniform program for certification of Historically Underutilized Businesses (HUBs) for use by state and local agencies, and to create and maintain a state-wide database of certified HUBs. This requirement for all state and local agencies to use HUB's listed in the database created in accordance with the new law becomes effective July 1, 2009.
- (c) Pursuant to the provisions of G.S. Article 3, § 143-128.4 shall read as follows:
 - (1) *G.S. 143-128.4*. Historically underutilized business defined; state-wide uniform certification. As used in this chapter, the term "historically underutilized business" means a business that meets all of the following conditions:
 - a. At least 51 percent of the business is owned by one or more persons who are members of at least one of the groups set forth in subsection (d) of this section, or in the case of a corporation, at least 51 percent of the stock is owned by one or more persons who are members of at least one of the groups set forth in subsection (d) of this section.
 - b. The management and daily business operations are controlled by one or more owners of the business who are members of at least one of the groups set forth in subsection (d) of this section.
 - (2) As used in this chapter, the term "minority business" means a historically underutilized business.
- (d) To qualify as a historically underutilized business under this section, a business must be owned and controlled as set forth in subsection (c) of this section by one or more citizens or lawful permanent residents of the United States who are members of one or more of the following groups:
 - (1) *Black*. A person having origins in any of the black racial groups of Africa.
 - (2) *Hispanic*. A person of Spanish or Portuguese culture having origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race.
 - (3) *Asian American*. A person having origins in any of the original peoples of the Far East, Southeast Asia, Asia, Indian continent, or Pacific Islands.
 - (4) *American Indian*. A person having origins in any of the original Indian peoples of North America.
 - (5) *Female*.
 - (6) *Disabled*. A person with a disability as defined in G.S. 168-1 or G.S. 168A-3.
 - (7) *Disadvantaged*. A person who is socially and economically disadvantaged as defined in 15 U.S.C. § 637.

(Ord. of 1-14-08(1), § 1)

Sec. 8-138. - Contractor selection procedures.

- (a) *Contractor and subcontractor selection*. The county may award the contract and/or reject bids in accordance with law, taking into consideration M/WBE requirements. In writing specifications and requirements for bidding, the county manger may specify what M/WBE and employment information and documents must be submitted with the bid, what M/WBE and employment information must be submitted afterwards and on what schedule. The employment information may include ethnicity, gender, and occupation of employees. If the county manager determines that a bid was made with good faith efforts to comply with this article, the county commissioners and the county manager shall consider that bid to have complied with this chapter in the absence of a bid which has met the M/WBE requirements, including having obtained the goals set forth pursuant to section 8-136.

- (b) *Number of bids.* To the extent allowed by law, for purposes of counting the minimum number of bids required under G.S. 143-132, bids made with good faith efforts to comply with this article shall not be considered to be nonresponsive for failing to meet the M/WBE requirements.
- (c) *Calculation of MWBE participation.* The degree of participation by minority-majority joint ventures, M/WBE contractors and subcontractors in contracts awarded shall be calculated as follows:
- (1) The total dollar value of the contract awarded to the M/WBE is counted as participation.
 - (2) The total dollar value of a contract awarded to an M/WBE owned and controlled by both minority males and nonminority females is counted as participation for minorities and women respectively, in proportion to the percentage of ownership and control of each group in the business. The total dollar value of an M/WBE owned and controlled by minority women is counted as either the minorities' or women's participation, but not both. The M/WBE may choose which category the credit will apply.
 - (3) The county may count as its M/WBE participation a portion of the total dollar value of a contract with a joint venture eligible under the standards of this article equal to the percentage of the ownership and control of the M/WBE partner in the joint venture.
 - (4) The county may count as M/WBE participation only expenditures to an M/WBE that performs a commercially useful function when it is responsible for execution of a distinct element of the work of a contract and for carrying out its responsibilities by actually performing, managing, and/or supervising the work involved. The qualified owners themselves must be actively involved in carrying out those responsibilities. To determine whether an M/WBE is performing a commercially useful function, the county shall take into account the amount of work subcontracted, industry practices, the adequacy of the resources of the business for the work, the qualification of the owners.
 - (5) Consistent with normal industry practices, an M/WBE may enter into subcontracts. If an M/WBE bidder or contractor subcontracts a significantly greater portion of the work of the contract than would be expected based on normal industry practices, the M/WBE shall be presumed not to be performing a commercially useful function. The M/WBE may present evidence to rebut this presumption to the county.
- (d) *Documenting M/WBE participation.* Bidders shall be required to submit, at a time and in a form specified by the director, the following information on each M/WBE related subcontract:
- (1) A description of the subcontractors for significant goods and services to be used to perform the prime contract, and the name, address, contact person and telephone number of each of those subcontracts;
 - (2) The dollar amount of participation of each M/WBE;
 - (3) A statement of intent from each prospective M/WBE subcontractor identified in subsection (d)(1) above, to the effect that it intends to subcontract as described;
 - (4) If the bid does not indicate that the bidder will achieve the applicable M/WBE goals, the bidder shall submit sworn statements, with appropriate documentation, showing that it made good faith efforts to engage M/WBEs; and
 - (5) M/WBE's must be certified by the North Carolina Department of Administration HUB Office, or by another certifying agency of the State of North Carolina or local unit of government prior to submittal of a bid in order to receive credit towards the achievement of the M/WBE goals.
- (e) *Good faith efforts.* It is the responsibility of bidders and contractors to make good faith efforts. Any act or omission by the county shall not relieve them of this responsibility. The county manager shall apply the following criteria, with due consideration of the quality, quantity, intensity and timeliness of efforts of bidders and contracts, in determining good faith efforts to engage M/WBEs, along with criteria that the county manager deems proper:
- (1) Attendance at the pre-bid conference, if held;

- (2) Whether and when the bidder or contractor provided written notice to all M/WBEs listed in the North Carolina Department of Administration HUB Office databank that performs the type of work to subcontract and advising the M/WBEs:
 - a. Of the specific work the bidder or contractor intends to subcontract;
 - b. That their interest in the contract is being solicited; and
 - c. How to obtain and inspect the applicable plans, specifications and descriptions of the item to be purchased.
- (3) Whether the bidder or contractor selected feasible portions of work to be performed by M/WBEs, including, where appropriate, breaking contracts or combining elements of work into feasible units, and considering the ability of the bidder or contractor to perform the work with its work force;
- (4) Whether the bidder or contractor considered all bids received from M/WBEs and for those bids not accepted, the bidder or contractor shall provide an explanation of why the M/WBE will not be used during the course of the contract;
- (5) Whether the bidder or contractor provided interested M/WBEs assistance in reviewing applicable plans and specification and descriptions of items to be purchased;
- (6) Whether the bidder or contractor advertised in general circulation, trade association and minority/women focus media concerning the subcontracting opportunities;
- (7) Whether the bidder or contractor provided written notice to a reasonable number of specific M/WBEs that their interest in the contract was being solicited, in sufficient time to allow them to participate effectively;
- (8) Whether the bidder or contractor followed up initial solicitation of interest by contacting M/WBEs to determine with certainty whether the M/WBEs were interested;
- (9) Whether the bidder or contractor provided interested M/WBEs with adequate information about the plans and specification and requirements of the contract;
- (10) Whether the bidder or contractor negotiated in good faith with interested M/WBEs, not rejecting M/WBEs as unqualified without sound reason based on a thorough investigation of their capabilities;
- (11) Whether the bidder or contractor made efforts to assist interested M/WBEs in obtaining bonding, lines of credit or insurance if such assistance was necessary;
- (12) Whether the bidder or contractor effectively used the services of available minority/women community organizations; minority/women contractor groups; local, state and federal minority/women business assistance offices; and other organizations which provided assistance in recruitment and placement of M/WBEs;
- (13) Whether the bidder or contractor has utilized M/WBE subcontractors on other county contractors; and
- (14) Whether the bidder or contractor's efforts were merely pro forma, and given all relevant circumstances, could not reasonably be expected to provide sufficient M/WBE participation to meet the goals.

(Ord. of 1-14-08(1), § 1)

Sec. 8-139. - Enforcement and monitoring.

(a) *Contract compliance.*

- (1) The county manager and the director shall be responsible for monitoring all contracts for compliance with M/WBE requirements. They may take the following steps to determine such compliance:
 - a. Conducting site visits;
 - b. Reviewing all documents submitted for payment by the contractor to determine whether payments are being made to M/WBEs as indicated in the contract and bid;
 - c. Reviewing certification.
 - (2) The contractor shall submit such information to the director, which the director designates as reasonably necessary to determine whether the contractor complies with the M/WBE requirements of the contract.
 - (3) If the county manager, with the advice of the director, notifies the contractor of the county manager's finding that there are deficiencies in the performance of the contractor insofar as compliance with this article, the contractor shall have 15 days, or if 15 days do not remain in the contract, a reasonable lesser amount of time to cure the deficiencies. If a contractor materially breaches the M/WBE requirements of the contract, and has not cured the breach within the time allowed for the purpose, the county commissioners shall have the right to take all lawful action in response thereto, including, but not limited to, terminating the contract, imposing liquated damages, and/or considering the contractor to be nonresponsible when awarding future county contractors.
- (b) *Sanctions.* All contractors, after being awarded a contract, are legally bound to observe their terms of the contract, including all M/WBE provisions. The county commissioners have the authority to impose penalties for noncompliance with the provisions of this article including, suspension of contract eligibility, liquated damages, and termination of the contract.
- (c) *Maintaining M/WBE participation.* Contractors must maintain the M/WBE percentages indicated at the time of contract award throughout the term of the contract. This includes any increase of the contract by amendment of change order. For contracts in the amount provided by G.S. 143-129, or any local act pertaining thereto where there are certified minority/women business enterprise firms available for subcontracting, failure by the contractor to comply with pre-bid requirements under section 8-138, or to adequately document good faith efforts to subcontract with M/WBE firms, or to purchase significant material supplies from M/WBE firms, shall subject the bid to rejection as being nonresponsive.
- (d) *Monitoring the program.* The county manager, with input of the director, shall be responsible for monitoring the implementation of this article and reporting to the county commissioners annually on the efficiency of this article. To the greatest extent possible the county shall utilize computerized electronic systems for monitoring compliance and providing reports as required under this article. Toward that end, the county manger shall have compiled:
- (1) Reports from the information submitted by successful bidders outlining the total dollars spent and the amount spent for minority contractors;
 - (2) A fiscal report on all contracts awarded;
 - (3) A comparison of the percentage of M/WBEs and major contractors doing business with the county;
 - (4) A report on the percentage of M/WBEs located in the county;
 - (5) Reports describing the general categories of contracts awarded M/WBEs;
 - (6) Reports showing the percentage of dollar values of all contracts awarded during the quarter which were awarded to M/WBEs;
 - (7) Separate records relating to MBEs and WBEs; and
 - (8) Other documentation necessary to substantiate disparity.

(Ord. of 1-14-08(1), § 1)

Sec. 8-140. - Contracts awarded by the county manager.

(a) The county manager may determine that all or specified portions of the following parts of this article shall not apply to contracts that are to be awarded by the county manager:

Section:

8-135(a)(2)	Advertising for bids
8-135(c)	Bidders' responsibilities
8-138(d)	Documenting M/WBE participation
8-138(e)	Good faith efforts

(b) The determination may be made for classes of contracts or for individual contracts. The determination shall be in writing.

(Ord. of 1-14-08(1), § 1)

Sec. 8-141. - Federal and state requirements; conflict resolution.

Where a federal or state grant agreement, or any federal or state law or regulations prevent the full application of this article, this article shall apply to the extent permitted by the applicable agreement, laws, and regulations.

(Ord. of 1-14-08(1), § 1)

Sec. 8-142. - Effective date.

This article shall continue in effect until 11:59 p.m. on December 31, 2012, at which time it shall be deemed repealed without further action by the county commissioners. Unless otherwise provided by an ordinance enacted by the county commissioners or by a contract between the county and the other party of the contract, if a legal action is commenced before the repeal of this article to enforce any contractual provision which incorporates by reference any of this article, the rights of parties with respect to such contractual provision shall, for purposes of the legal action, continue in effect notwithstanding the repeal. This article shall be effective on ratification.

(Ord. of 1-14-08(1), § 1)

The total value of minority business contracting will be (\$)_____

AFFIDAVIT A

This Affidavit and ALL THREE (3) SECTIONS Herein Must Be Completed By ALL BIDDERS and Submitted with Bid.

Section I - Listing of the Good Faith Effort

Bidder must earn at least 50 points from the Good Faith Efforts list for their Bid to be considered responsive and must submit documentation supporting all items checked within the timeframes set forth in Section III below.

I have made Good Faith Effort to comply under the following areas checked:

- 1 - Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed. "Contact" means contact by letter, fax, e-mail or other means to a viable and active address. CONTRACTOR MUST ATTACH EVIDENCE OF CONTACT TO THIS AFFIDAVIT AND SUBMIT WITH BID. Value = 10 points.
- 2.-Made the construction plans, specifications and requirements available for review by prospective MWBE businesses, or providing these documents to them at least 10 days before the bids are due. Value = 10 points.
- 3 - Broken down or combined elements of work into economically feasible units to facilitate minority participation. Value = 15 points.
- 4 - Worked with MWBE trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of MWBE'S. Value = 10 points.
- 5 - Attended prebid meetings scheduled by the public owner. Value = 10 points.
- 6 - Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors. Value = 20 points.
- 7 - Negotiated in good faith with interested MWBE'S and did not reject them as unqualified without discussing with MWBE'S sound reasons based on their capabilities. CONTRACTOR MUST ATTACH TO THIS AFFIDAVIT AND SUBMIT WITH BID COPIES OF QUOTES OR RESPONSES FROM ALL FIRMS SUBMITTING QUOTES OR RESOPNSES, AND, IF APPLICABLE, WRITTEN JUSTIFICATION FOR ANY REJECTION OF A MWBE BASED ON LACK OF QUALIFICATION. Value = 15 points.
- 8 - Provided assistance to an otherwise qualified MWBE in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help MWBE businesses in establishing credit. Value = 25 points.
- 9 - Negotiated joint venture and partnership arrangements with MWBE businesses in order to increase opportunities for MWBE business participation on the construction or repair project when possible. Value = 20 points.
- 10 - Provided quick pay agreements and policies to enable MWBE contractors and suppliers to meet cash-flow demands. Value = 20 points.

The undersigned hereby certifies that he or she has read the terms of the MWBE business commitment, that the bidder has made the Good Faith Efforts in the areas checked above, and that he or she is authorized to bind the bidder to the commitment herein set forth.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Section II - Portion of the Work to be Performed by Minority Firms

I will expend a minimum of _____% of the total dollar amount of the contract with MWBE. MWBE will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below.

(Attach additional sheets if necessary)

Name and Phone Number	*MWBE Category	Work description	Dollar Value

*MWBE categories: Black, African American (B), Hispanic (H), Asian American (A) American Indian (I), Female (F) Socially and Economically Disadvantaged (D)

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with MWBE for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date _____ Name of Authorized Officer: _____

Signature: _____

Section III — Documentation of Good Faith Efforts

ALL BIDDERS, regardless of percentage of MWBE participation, MUST provide documentation of all Good Faith Efforts checked in Section I within the timeframes set forth in Parts A and B below.

Failure to submit these documents / information shall be grounds for deduction of Good Faith Points. In the event such a deduction results in a failure to achieve the required number of Good Faith Points, the Bid shall be rejected unless the bidder has otherwise demonstrated Good Faith Efforts.

PART A (Documentation Required to be Submitted With Bid)

Documentation MUST be provided WITH THE BID in order for the bidder to receive credit for certain items checked. If the bidder checked Items 1 or 7 in Section I, the bidder MUST provide documentation supporting those Good Faith Efforts WITH THE BID.

Examples of such documentation include, but are not limited to, the following:

ITEM 1

- Copies of solicitations for quotes to at least three (3) MWBE's from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.
- Copies of quotes and responses received from each firm responding to the solicitation.
- A telephone log of follow-up calls to each firm sent a solicitation.

ITEM 7

- Copies of quotes or responses received from all firms submitting quotes or responses for each subcontract, and, if applicable a letter detailing the reason(s) for any rejection of minority business(es) due to lack of qualification.

I do certify the attached documentation as true and accurate representation of my good faith efforts.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of North Carolina, County of _____
Subscribed and sworn to before me this _____ day of _____ 20____
Notary Public _____
My commission expires _____

PART B (Documentation Required to be Submitted Within 72 Hours of Notification)

Certain documentation **MUST** be provided within 72 hours of notification of being the apparent lowest responsible, responsive bidder in order to receive credit for certain additional Items checked. If the bidder checked Items 2, 3, 4, 5, 6, 8, 9 or 10, the bidder **MUST** provide documentation supporting those Good Faith Efforts within 72 hours of notification of being the apparent lowest responsible, responsive bidder.

Examples of such documentation include, but are not limited to the following:

ITEM 2

- Invitation to view construction plans, specifications and requirements.
- Cover letter enclosing construction plans, specifications and requirements.

ITEM 3

- Copies of all bid solicitations or request for proposals broken down by scope of work.
- Letter detailing contractor's efforts to break down or combine elements of work into economically feasible units to facilitate minority participation.

ITEM 4

- Documentation of any contacts or correspondence to MWBE, community, or contractor organizations in an attempt to meet the goal.

ITEM 5

- Copy of pre-bid roster.

ITEM 6

- Letter documenting efforts to provide assistance in obtaining required bonding or insurance for MWBE.

ITEM 8

- Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

ITEM 9

- Letter documenting negotiations with MWBE businesses to create joint venture or partnership arrangement for the construction or repair project.

ITEM 10

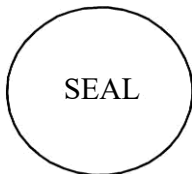
- Copy of quick pay agreements.
- Copy of quick pay policies.

I do certify the attached documentation as true and accurate representation of my good faith efforts.

Date _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of North Carolina, County of _____

Subscribed and sworn to before me this _____ day of _____ 20 _____

Notary Public _____

My commission expires _____

AFFIDAVIT B Intent to Perform Contract with Own Workforce.

County of _____

Affidavit of _____
(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the _____

_____ contract.
(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform elements of the work on this project with his/her own current work forces; and

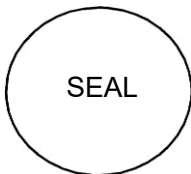
The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of North Carolina, County of _____

Subscribed and sworn to before me this _____ day of _____ 20____

Notary Public _____

My commission expires _____

APPENDIX E

MWBE DOCUMENTATION FOR CONTRACT PAYMENTS

Prime Contractor/Architect: _____

Address & Phone: _____

Project Name: _____

Pay Application #: _____ Period: _____

The following is a list of payments made to Minority and Women Business Enterprises on this project for the above-mentioned period.

A	B	C	D	E	F	G	H
MWBE FIRM NAME	* TYPE OF MWBE	ORIGINAL CONTRACT AMOUNT	PREVIOUS PAYMENTS	PAYMENT THIS PERIOD	TOTAL CHANGE ORDERS TO DATE	TOTAL AMOUNT COMMITTED (C +F)	TOTAL RETAINED TO DATE

*Minority categories: Black (B), Hispanic (H), Asian American (AA), American Indian (AI), White Female (WF), Socially and Economically Disadvantaged (SED)

Approved/Certified By:

Name

Title

Date

Signature

SUBMIT WITH EACH PAY REQUEST - FINAL PAYMENT - FINAL REPORT

Identification of MWBE Participation

Submission of Affidavits which include statements of "To Be Determined" or failure to submit the required information as outlined in the Specifications shall cause the Bid be deemed non-responsive and subject to rejection.

(Name of Bidder)

do hereby certify that on this project, we will use the following minority business enterprises as construction subcontractors, vendors, suppliers or providers of professional services.

Firm Name, Address and Phone #	Work type	"MWBE Category

*Minority categories: Black, African American (B), Hispanic (H), Asian American (A) American Indian (I), Female (F) Socially and Economically Disadvantaged (D)

**DURHAM PUBLIC SCHOOLS BOARD OF EDUCATION
POLICY NUMBER 6070:**

Minority Business Enterprise Participation in Construction and Purchase Contracts

It is the policy of the Board to provide minorities equal opportunity to participate in all aspects of the school system's contracting and purchasing programs, including but not limited to participation in procurement contracts for materials, supplies and equipment, and contracts for the construction, renovation or repair of school facilities and equipment.

It is further the policy of the Board to prohibit discrimination against any person or business enterprise on the basis of race, color, ethnic origin, sex, handicapping condition, or religion and to conduct its contracting and purchasing programs so as to prevent such discrimination.

It is the policy of the Board in concert with other local, state and federal agencies and with the assistance of minority groups and agencies, actively to seek and identify qualified minority business enterprises (MBEs) and to offer them the opportunity to participate, and to encourage them to participate, in the school system's contracting and purchasing programs. Under this policy, the Board adopts the definition of MBEs contained in N.C. Gen. Stat. 143-128.2.

It is not the policy of this Board to provide information or other opportunities to minority business enterprises that will not be available to all other business enterprises. It is the intent of this policy to establish procedures designed to assure MBEs access to information and opportunities available to other business enterprises. It is not the intent of this policy to establish procedures that will increase the cost of the school system's construction and purchasing programs. It is the intent of this policy to widen opportunities for participation, to increase competition, and to reduce costs.

The Board will award public building contracts without regard to race, religion, color, creed, national origin, sex, age, or handicapping condition, as defined in N.C. Gen. Stat. 168A-3. The Board will award contracts to the lowest responsible, responsive bid.

Durham Public Schools is following Chapter 8 Article V of the Durham County Code of Ordinances for M/WBE Participation.

These projects shall be bid strictly in accordance with N.C. Gen. Stat. § 143-128 and -129. The school system shall require bidders on school construction and renovation projects to provide documentation demonstrating that they have met the verifiable goal for participation by minority business or that they have made good faith efforts to do so as specified in the accompanying regulations and in N.C. Gen. Stat. § 143-128.2. Data generated pursuant to this section shall be reported to the Department of Administration, Office of Historically Underutilized Business, as required by N.C. Gen. Stat. § 143-128.3(a).

OWNER-CONTRACTOR AGREEMENT

PROJECT NUMBER: 341-03

SCHOOL NAME: **Lakeview School**

THIS AGREEMENT, in four (4) copies, made this () day of _____, Two Thousand and Twenty Three by and between _____ (herein referred to as the "Owner"), whose mailing address is _____ and _____. (herein referred to as the "Contractor"), whose mailing address is _____. Correspondence, submittals, and notices relating to or required under this Contract shall be sent in writing to the above addresses; unless either party is notified in writing by the other, of a change in address.

WITNESSETH:

WHEREAS, it is the intent of the Owner to obtain the services of the Contractor in connection with the new construction of () (hereinafter referred to as the "Project" or the "Work"); and

WHEREAS, the Contractor desires to perform such construction in accordance with the terms and conditions of this Agreement,

NOW, THEREFORE, in consideration of the promises made herein and other good and valuable consideration, the following terms and conditions are hereby mutually agreed to, by and between the Owner and Contractor:

Article 1

DEFINITIONS

1.1 All terms in this Agreement which are defined in the Information for Bidders and the General Conditions shall have the meanings designated therein.

1.2 The Contract Documents are as defined in the General Conditions. Such documents form the Contract, and all are as fully a part thereof as if attached to this Agreement or repeated herein. The Contract Documents consist of the Owner-Contractor Agreement, the General and Supplemental Conditions of the Contract, the Drawings, the Specifications, all Addenda issued prior to bidding, and all Modifications and Change Orders issued after execution of the Contract.

Article 2

STATEMENT OF THE WORK

2.1 The Project is the Work identified in the plans and specifications prepared by _____ dated _____, 2019 for _____ Board of Education, _____, including the following addenda:

A listing of the plans and specifications included in the Contract Documents is attached as Exhibit A.

2.2 The Parties agree that the Project shall include the following alternates:

2.3 The Parties agree to the following modifications to the Project's plans and specifications, including the noted value engineering items:

List item(s) and proposed deduct/add(s). If none, delete this language list "None"

2.4 The Parties agree that the following allowances are included in the Contract Sum in Section 5.1 below:

List item(s) and proposed allowance(s). If none, delete this language list "None"

2.5 The Contractor shall provide and pay for all materials, tools, equipment, labor and professional and non-professional services, and shall perform all other acts and supply all other things necessary, to fully and properly perform and complete the Work, as required by the Contract Documents.

2.6 The Contractor shall further provide and pay for all related facilities described in any of the Contract Documents, including all work expressly specified therein and such additional work as may be reasonably inferred therefrom, saving and excepting only such items of work as are specifically stated in the Contract Documents not to be the obligation of the Contractor. The totality of the obligations imposed upon the contractor by this Article and by all other provisions of the Contract Documents, as well as the structures to be built and the labor to be performed, is herein referred to as the "Work".

Article 3

DESIGN CONSULTANT

3.1 The Design Consultant (as defined in the General Conditions) shall be () whose address is (), however, that the Owner may, without liability to the Contractor, unilaterally amend this Article from time to time by designating a different person or organization to act as its Design Consultant and so advising the Contractor in writing, at which time the person or organization so designated shall be the Design Consultant for purposes of this Contract.

Article 4

TIME OF COMMENCEMENT AND COMPLETION

4.1 The Contractor shall commence the Work promptly upon the date established in the Notice to Proceed. If there is no Notice to Proceed, the date of commencement of the Work shall be the date of this Agreement or such other date as may be established herein.

4.2 Time is of the essence. The Contractor shall achieve Final Completion, as defined in the General Conditions on or before the date established for Final Completion in the Supplemental Conditions.

- 4.3 The Supplemental Conditions contains certain specific dates that shall be adhered to and are the last acceptable dates unless modified in writing by mutual agreement between the Contractor and the Owner. All dates indicate midnight unless otherwise stipulated. The only exceptions to this schedule are defined in the General Conditions under 8.3 DELAYS AND EXTENSIONS OF TIME.
- 4.4 Should the Contractor fail to complete the Work on or before the dates stipulated for Substantial Completion and/or Final Completion, or such later date as may result from an extension of time granted by the Owner, he shall pay the Owner, as liquidated damages the sums set forth in the General and Supplemental Conditions.

Article 5

CONTRACT SUM

- 5.1 Provided that the Contractor shall strictly and completely perform all of its obligations under the Contract Documents, and subject only to additions and deductions by Modification or as otherwise provided in the Contract Documents, the Owner shall pay to the Contractor, in current funds and at the time and in the installments hereinafter specified, the sum of _____ Dollars (\$ _____) herein referred to as the "Contract Sum". This amount includes the base bid and the Alternates in Section 2.2
- 5.2 The Contract Sum includes the value engineering items and other contract modifications noted in Section 2.3 above that total \$ _____.
- 5.3 Unit Prices are established as follows for the Project:

Unit Price No. 1		\$
Unit Price No. 2		\$
Unit Price No. 3		\$
Unit Price No. 4		\$
Unit Price No. 5		\$

Unit Price No. 6		\$
Unit Price No. 7		\$
Unit Price No. 8		\$

Article 6

PROGRESS PAYMENTS

6.1 The Contractor hereby agrees that on or about the First day of the month for every month during the performance of the Work he will deliver to the Owner's Project Manager an Application for Payment in accordance with the provisions of Article 9 of the General Conditions. This date may be changed upon mutual agreement, stated in writing, between the Owner and Contractor. Payment under this Contract shall be made as provided in the General Conditions. Payments due and unpaid under the Contract Documents shall not bear interest.

Article 7

OTHER REQUIREMENTS

7.1 The Contractor shall submit the Performance Bond, Labor and Material Payment Bond and Certification of Insurance as required by the Contract Documents.

7.2 The Owner shall furnish to the Contractor one (1) set of drawings and one (1) set of specifications, at no extra cost, for use in the Construction of the Work. Additional sets of drawings or specifications may be obtained by the Contractor by paying the Owner for the costs of reproduction, handling and mailing.

7.3 The Contractor shall make a good faith effort to utilize Historically Underutilized Businesses (HUB's) per N.C. Gen. Stat. 143-128.2, and as described in the construction documents.

7.4 The General Conditions, Supplemental Conditions and the plans and specifications, including any addenda, are incorporated herein by reference.

IN WITNESS WHEREOF, _____ Board of Education (hereinbefore called the "Owner") has caused these presents to be signed and its corporate seal to be hereunto affixed, attested by its Chairperson and Secretary, and _____ (hereinbefore called "Contractor") has caused these presents to be signed by its President and its Corporate seal to be hereunto affixed, as hereinafter attested, all as of the day and year first above written.

Mike Lee, Chair, Durham Public Schools Board of Education _____
Date

This instrument has been pre-audited in the manner required by the School Budget and Fiscal Control Act.

Paul LeSieur, Chief Finance Officer, Durham Public Schools _____
Date

Endorsement:

Executive Director
Durham Public Schools
Construction & Capital Planning

This contract was approved by the Board on the **xxth day of Month Year.**

INSERT CONSULTANT / COMPANY NAME

By: _____

Name/Title: _____

STATE OF NORTH CAROLINA
COUNTY OF DURHAM

I, a Notary Public in and for the aforesaid County and State, do hereby certify that _____ personally appeared before me this day and acknowledged that he/she is _____ of _____, a _____ (state of incorporation) corporation, duly authorized to do business in the state of North Carolina, and that by authority duly given and as the act of the corporation, the foregoing instrument was signed in its name by its _____, sealed with its corporate seal and attested by _____ as its Corporate Secretary.

Witness my hand and notarial seal this ___ day of _____, 20____.

Notary Public (SEAL/STAMP)

My commission expires: _____

PERFORMANCE BOND

IT IS HEREBY AGREED that

(Insert full name and address of Contractor)

as Principal, hereinafter called Contractor, and,

(Insert full name and address of Surety)

as Surety, hereinafter called Surety, are held and firmly bound unto the

as Obligee, hereinafter called Owner, in the amount of _____ Dollars (\$ _____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these obligations.

WHEREAS, Contractor has by written agreement dated _____, 20__, entered into a contract with Owner for the construction of _____ (Insert the name of the Project)

in accordance with Drawings and Specifications prepared by _____ (Insert full name and address of Architect/Engineer)

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect. The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default, under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- 1) Complete the Contract in accordance with its terms and conditions, or
- 2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the Surety jointly of the lowest

responsible bidder, arrange for a contract between such bidder and Owner, and make available as Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price," as used in this paragraph, shall mean the total amount payable by Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of any applicable statute of limitations under the Contract.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of the Owner.

Signed and sealed this _____ day of _____ 20_____.

PRINCIPAL

[Affix corporate seal]

(Name) _____
(Title) _____

(Witness)

SURETY

[Affix corporate seal]

(Name) _____
(Title) _____

(Witness)

LABOR AND MATERIAL PAYMENT BOND

THIS BOND IS ISSUED SIMULTANEOUSLY WITH PERFORMANCE BOND IN FAVOR OF THE OWNER CONDITIONED ON THE FULL AND FAITHFUL PERFORMANCE OF THE CONTRACT

IT IS HEREBY AGREED that _____ (Insert full name and address of Contractor)

as Principal, hereinafter called "Principal," and, _____ (Insert full name and address of Surety)

as Surety, hereinafter called "Surety," are held and firmly bound unto the

as Obligee, hereinafter called Owner, for the use and benefit of claimants as hereinbelow defined, in the amount of _____ for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these obligations.

WHEREAS, Principal has by written agreement dated _____, 20_____, entered into a contract with Owner for the construction of _____ (Insert the name of the Project)

in accordance with Drawings and Specifications prepared by (Insert full name and address of Architect/Engineer)

which contract is by reference made a part hereof, and is hereinafter referred to as the "Contract."

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct contract with the principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.
2. The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.
3. No suit or action shall be commenced hereunder by any claimant:
 - a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days, after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is

made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail; postage prepaid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof, is situated, or in the United States District Court for the district in which the Project, or any part thereof, is situated, and not elsewhere.

4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and sealed this _____ day of _____ 20__.

PRINCIPAL

[Affix corporate seal]

(Name) _____
(Title) _____

(Witness)

SURETY

[Affix corporate seal]

(Name) _____
(Title) _____

(Witness)

Submittal Transmittal Form

DPS Lakeview School Controls Replacement

To: _____ Date: ____ / ____ / ____

Attn: _____

From: _____ Phone: (____) _____

Submitter: _____ Phone: (____) _____

Product: _____ Section: _____

Manufacturer: _____ Phone: (____) _____

Architectural Dwg. #: _____ Detail Ref: _____

Contractor's Remarks:

Number of Copies: _____ Submittal No.: _____

Product Substitution (*Yes/No): _____

* If yes, has Substitution Request Form been submitted and approved?

Product Substitution Form (Circle one): (Attached) (Previously Submitted & Approved)

DURHAM PUBLIC SCHOOLS
COUNTY SALES AND USE TAX REPORT
SUMMARY TOTALS AND CERTIFICATION
APPENDIX A

CONTRACTOR: _____

Page _____ of _____

PROJECT: _____

FOR PERIOD: _____

	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL ALL COUNTIES
CONTRACTOR							
SUBCONTRACTOR(S) *							
COUNTY TOTAL							

- Attach subcontractor(s) report(s)
- ** Must balance with Detail Sheet(s)

I certify that the above figures do not include any tax paid on supplies, tools and equipment which were used to perform this contract and only includes those building materials, supplies, fixtures and equipment which actually became a part of or annexed to the building or structure. I certify that, to the best of my knowledge, the information provided here is true, correct, and complete.

Sworn to and subscribed before me,

This the _____ day of _____, 19____

Notary Public

My Commission Expires: _____

Seal

Signed

Print or Type Name of Above

NOTE:
This certified statement may be subject to audit

STATE OF NORTH CAROLINA
 SALES AND USE TAX REPORT DETAIL
 APPENDIX A

CONTRACTOR: _____

Page _____ of _____

SUBCONTRACTOR _____

FOR PERIOD: _____

PROJECT: _____

PURCHASE DATE	VENDOR NAME	INVOICE NUMBER	TYPE OF PROPERTY	INVOICE TOTAL	COUNTY TAX PAID	COUNTY OF SALE *
				\$	\$	
TOTAL:					\$	

* If this is an out-of-state vendor, the County of Sale should be the county to which the merchandise was shipped.

CHANGE PROPOSAL WORKSHEET SUMMARY FORM

Durham Public Schools
Lakeview School Controls
Replacement
DPS Project No 341-03

Project:
Contract:
Contractor:

Proposal #:
Project #:
Contractor #:

Description of change:

INSTRUCTIONS FOR FORM: Only enter data in yellow boxes - all other fields will automatically calculate.

Contractor's detailed breakdown of material & labor must accompany this form. Percentages shaded in gray boxes are established by contract requirements and should not be modified.

Materials	(Attach list with Qty, Item, Unit \$, Unit mh, Total mh, OT mh, Total \$)		SUBTOTALS	
1	Total Direct Cost of Materials	\$0.00		
2	Overhead & Profit on Item 1. (10% maximum, includes small tools & consumables)	10.0 % \$0.00		
3	Sales Tax	7.5 % \$0.00		
4	Shipping & Transportation	\$0.00		
			\$0.00	
Labor				
5	Manhours - Straight Time	0 MH @ \$25.00 /hr. \$0.00		
	Overtime Premium	0 MH @ \$12.50 /hr. \$0.00		
6	Overhead & Profit on Item 5. (10% maximum on straight labor cost, not premium portion) (O & P includes supervision time)	10.0 % \$0.00		
7	Payroll Taxes & Insurance	30.0% STRAIGHT TIME ONLY \$0.00		
		7.65% OVERTIME PORTION \$0.00		
				\$0.00
Equipment Rental (Include quotes)				
8	Equipment Rental	\$0.00		
9	Overhead & Profit on Item 8. (6% maximum)	6.0 % \$0.00		
Subcontractors (Include quotes with material & equipment backup)				
10	Subcontractors	\$0.00		
11	Overhead & Profit on Item 10. (6% maximum)	6.0 % \$0.00		
			\$0.00	
			Subtotal of Proposal \$0.00	
12	Bonds (% of subtotal of proposal)	1.5% \$0.00	\$0.00	
			TOTAL OF CHANGE PROPOSAL \$0.00	

Time Extension Requests: _____ day(s) Schedule Activity # Affected: _____

The Contractor agrees to perform the work outlined in this change proposal for the amount specified above and in accordance with the Contract documents if the work is authorized by the Owner.

Contractor's Signature: _____

Date: _____

Recommended by Design Consultant: _____

Date: _____

Owner's Representative Approval: _____

Date: _____

Change Order Request Form

PM Initials _____
 DOC Initials _____

DPS Lakeview School Controls Replacement

Reference: (RFI, RFP, ASI, BD)

DATE: _____ PROPOSAL #: _____ CONTRACT: _____

CONTRACTOR: _____ CONTRACTOR #: _____

DESCRIPTION OF CHANGE: _____

Materials

(Attach list with qty, item, unit mh, total mh, OT mh, Total \$)

- 1 Total direct cost of materials \$ -
- 2 Sales Tax 6.75% \$ -
- 3 Shipping and transportation \$ -
- 4 Overhead and Profit on Items 1-3 \$ - (10% maximum). (Includes small tools & consumables)

Materials Subtotal \$ -

Labor (include time sheets if requested)

- 5 Total man-hours: 0 @ 0 \$ -
- 6 Payroll taxes and insurance@ 0% \$ - (40% maximum)
- 7 Overhead and Profit on Items 5 & 6 \$ - (10% maximum). (O&P includes supervisor's time).

Labor Subtotal \$ -

Equipment Rental (includes quotes and pick-up / delivery tickets)

- 8 Equipment Rental \$ -
- 9 Overhead and Profit on Item 8 \$ - (10% maximum)

Equipment Rental Subtotal \$ -

Subcontractors (includes quotes with material and equipment backup)

- 10 Subcontractors \$ -
- 11 Overhead and Profit on Item 10 \$ - (5% maximum)

Subcontractor Subtotal \$ -

Subtotal of Proposal \$ -

- 12 Bonds (___% of subtotal proposal) 0% \$ - (2% maximum)

TOTAL OF CHANGE PROPOSAL \$ -

Time Extension Request _____ days _____ Schedule Activity # Affected _____ Schedule Date: _____

Contractor's Signature: _____ Date: _____

Architect's Signature: _____ Date: _____

Owner's Signature: _____ Date: _____

Note: Subcontractors must also fill out this form for all requested change orders.

Certificate of Compliance Section 00 65 13

DPS Lakeview School Controls Replacement

Date: **[Insert Date]**

Project Address: _____

I here by certify that to the best of my knowledge and actions the As-Built/Record Drawings for the above-indicated project are complete and accurate.

Company: _____
(Firm or Corporation making certification)

Represented By: _____
(Person authorized to sign)

Title: _____

Address: _____

License Number: _____

Federal ID Number: _____

Attest:

By: _____

Title: _____

Contractor's General Warranty

DPS Lakeview School Controls Replacement

Date: _____
Project: _____
Contract: _____
Address: _____

The undersigned Contractor hereby warrants, in accordance with the applicable provisions and terms set forth in the Contract Documents, all materials and workmanship incorporated in the _____ contract of the _____ School, _____, Durham County, North Carolina, against any and all defects due to faulty materials or workmanship or negligence for a period of twelve (12) months, or such longer periods as set forth in the Contract Documents, from the effective date **of this warranty (_____)** as defined by the date of substantial completion . This warranty supercedes any and all dates listed in the enclosed subcontractor warranties thus honoring warranty work one year from the date of substantial completion listed here. This contractor further warrants all work incorporated in this project to remain leak proof and watertight at all points for a period of twenty-four (24) months from the effective date of this Warranty.

This Warranty shall be binding where defects occur due to normal usage conditions and does not cover willful or malicious damage, damage caused by acts of God or other casualties beyond the control of the Contractor.

This Warranty shall be in accordance to other warranties and guarantees set forth in the Contract Documents, and shall not act to constitute a waiver of additional protection of the Owner afforded, where applicable, by consumer protection and product liability provisions of law, and these stipulations shall not constitute waiver of any additional rights or remedies available to the Owner under the law.

Date of Substantial Completion: _____

(General Contractor)

By _____

Title _____

Address _____

Subscribed and sworn before me this
_____ day of _____, 20____

License # _____

Fed ID # _____
(Corporate Seal)

(Notary Public)

Certificate of Non Use of Asbestos-containing Products

DPS Lakeview School Controls Replacement

Date: _____

Project: _____

Address: _____

I here by certify that to the best of my knowledge the products and materials incorporated into the above referenced project are free of asbestos and asbestos-containing materials.

Company: _____

(Name of Firm of Corporation making certification)

Represented By: _____

(Person authorized to sign)

Title: _____

(Owner/Partner/Pres./V. Pres.)

Address: _____

License Number: _____

Federal ID Number: _____

Attest:

By: _____

Title: _____

GENERAL CONDITIONS

NOTICE OF DISCLAIMER

TAKE NOTICE, that these General Conditions may contain language and Article, Section or Paragraph headings or names which appear similar to or the same as the provisions of the "General Conditions of the Contract for Construction", published by the American Institute of Architects, AIA Document A-201.

TAKE NOTICE, however, that these General Conditions are substantially and materially different in many respects from the AIA Document A-201 and that certain additions, deletions or other modifications have been made to provisions similar to those contained in the AIA Document. This document, further, contains provisions, which do not appear in the AIA document.

The use of any language or Article or Paragraph format similar to or the same as AIA Document A-201 does not constitute an endorsement by the American Institute of Architects of this document.

SECTION V GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

TABLE OF ARTICLES

1. CONTRACT DOCUMENTS	9. PAYMENTS AND COMPLETION
2. DESIGN CONSULTANT	10. PROTECTION OF PERSONS AND PROPERTY
3. OWNER	11. INSURANCE
4. CONTRACTOR	12. CHANGES IN THE WORK
5. SUBCONTRACTORS	13. UNCOVERING AND CORRECTION
6. WORK BY OWNER OR BY SEPARATE CONTRACTORS	14. TERMINATION OF THE CONTRACT
7. MISCELLANEOUS PROVISIONS	15. DISPUTE RESOLUTION
8. TIME	

ARTICLE 1

CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 AS SHOWN, AS INDICATED, AS DETAILED: These words, and words of like implication, refer to information contained in Drawings and Specifications describing the Work, unless explicitly stated otherwise in the Contract Documents.

1.1.2 CLAIM: A Claim as used in the Contract is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of contract terms, payment of money, a credit against the payment of money, extension of time or other relief with respect to the terms of the Contract. The term Claim also includes other disputes and matters in question between the parties to a contract involved in the Owner's construction and repair projects arising out of or

relating to the Contract or the construction process.

- 1.1.3 **CONTRACT:** The Contract is the sum of all the Contract Documents. The Contract represents the entire and integrated agreement between the Owner and the Contractor and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Paragraph 1.1.4. The Contract may also be referred to in the Contract Documents as “this Contract”, “this Agreement” or “the Agreement”.
- 1.1.4 **CONTRACT DOCUMENTS:** The Contract Documents consist of the Owner-Contractor Agreement, the Conditions of the Contract (General and Supplemental Conditions), the Plans, Drawings, and Specifications, and all Addenda thereto issued prior to and all Modifications thereto issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties; (2) a Change Order or a Construction Change Directive issued pursuant to the provisions of Article 12; (3) a written interpretation issued by the Design Consultant pursuant to Paragraph 2.2.7; or (4) a written order for a minor Change in the Work issued pursuant to Section 12.4. The Contract Documents do not include any other documents including but not limited to soils, geotechnical or other reports, surveys and analysis, which may be printed, bound or assembled with the Contract Documents, or otherwise made available to the Contractor for review or information under this Contract, unless specifically enumerated and directly incorporated by reference in the Contract Documents.
- 1.1.5 **HE/HIS:** The term He or His is not intended to be gender specific.
- 1.1.6 **MANUFACTURER:** An individual, company, or corporation who manufactures, fabricates, or assembles a standard product. A standard product is one that is not made to special design, and if furnished by either direct sale or by contract to the Contractor, Subcontractor or Vendor.
- 1.1.7 **MATERIAL SUPPLIER OR VENDOR:** A person or organization who supplies, but who is not responsible for the installation of, materials, products and equipment.
- 1.1.8 **NOTICE:** The term Notice as used herein shall mean and include written notice. Notice shall be deemed to have been given when delivered to the address of the person, firm or corporation for whom intended, or to his, their or its duly authorized agent, representative or officer; or when enclosed in a postage prepaid wrapper or envelope addressed to such person, firm or corporation at his, their or its Notice Address and deposited in a United States mailbox by registered or certified mail. To “Notify” means to give Notice. The Notice Addresses for the Owner and Contractor are stated in the Owner-Contractor Agreement and may be changed by a party by giving Notice to the other of such change.
- 1.1.9 **PLANS OR DRAWINGS:** All drawings or reproduction of drawings pertaining to the Work.
- 1.1.10 **PRODUCT:** The term Product includes materials, systems and equipment.
- 1.1.11 **PROJECT:** The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part.
- 1.1.12 **PROPOSAL:** A complete and properly signed document whereby the Contractor proposes to provide additional or a reduced scope of construction work on the Project for the sums stipulated therein, supported by data required by the Design Consultant or Owner.
- 1.1.13 **PROVIDE:** As a directive to the Contractor, and as pertaining to labor, materials or equipment,

"provide" means "furnish and install completely".

- 1.1.14 SPECIFICATIONS: Descriptions, provisions and requirements, pertaining to method and manner of performing the Work, or to quantities and qualities of materials or equipment to be furnished under terms of the Contract.
- 1.1.15 WORK: The Work comprises the construction and services required of the Contractor by the Contract Documents and includes all labor, supplies and other facilities or things necessary to produce such construction, and all materials, equipment, and supplies incorporated or to be incorporated in such construction.
- 1.2 EXECUTION, CORRELATION AND INTENT
 - 1.2.1 The Contractor and Owner acknowledge that neither these General Conditions, nor any other Contract Document shall be construed against the Owner due to the fact that they may have been drafted by the Owner or the Owner's agent. For the purposes of construing these General Conditions, and any other Contract Document, both the Contractor and the Owner shall be considered to have jointly drafted them.
 - 1.2.2 The Owner-Contractor Agreement shall be signed in not less than three (3) copies by the Owner and Contractor, and each of which shall be deemed an original, but all of which shall constitute one and the same instrument.
 - 1.2.3 By executing the Contract, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.
 - 1.2.4 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings unless otherwise specifically defined herein. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light upon the interpretation of the provisions to which they refer.
 - 1.2.5 The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings are for convenience only. The Contractor may subcontract the Work in such divisions as he sees fit consistent with applicable law and he is ultimately responsible for furnishing all of the Work.
 - 1.2.6 Anything shown on the Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Drawings shall have the same effect as if shown or mentioned respectively in both. Detailed specifications take priority over general specifications and detailed drawings take precedence over general drawings. Any Work shown on one drawing shall be construed to be shown in all drawings. If any portion of the Contract Documents shall be in conflict with any other portion, the various documents comprising the Contract Documents shall govern in the following order of precedence: The Owner-Contractor Agreement; the Supplemental Conditions; the General Conditions; the Specifications; the

Drawings. The Contractor shall notify the Design Consultant and the Owner of all such inconsistencies promptly. Any such conflict or inconsistency between or in the Drawings or Specifications shall be submitted by the Contractor promptly to the Owner and Design Consultant and the Design Consultant's decision thereon shall be final and conclusive.

- 1.2.7 The Contractor agrees that nothing contained in the Contract Documents or any contract between the Owner and the Design Consultant shall create any contractual relationship between the Design Consultant and the Contractor, or between the Design Consultant and any Subcontractor or Sub-subcontractors. The Contractor acknowledges and agrees that this Contract is not intended to create, nor shall any provision be interpreted as creating, any contractual relationship between the Owner or Contractor and any third parties.
- 1.2.8 The provisions of this Contract cannot be amended, modified, varied or waived in any respect except by a Modification. The Contractor is hereby given notice that no person has authority to orally waive, or to release the Contractor from any of the Contractor's duties or obligations under or arising out of this Contract. Any waiver, approval or consent granted by Modification to the Contractor shall be limited to those matters specifically and expressly stated thereby to be waived, approved or consented to and shall not relieve the Contractor of the obligation to obtain any future waiver, approval or consent.
- 1.2.9 Any material or operation specified by reference to published specifications of a Manufacturer, a society, an association, a code, or other published standard, shall comply with requirements of the listed document which is current on date the Owner received bids for the construction of the Project. In case of a conflict between referenced document and the Specifications, Specifications shall govern. In case of a conflict between such listed documents, the one having more stringent requirements shall govern.
- 1.2.10 The Contractor, if requested, shall furnish an affidavit from each or any Manufacturer certifying that materials or products delivered to the job meets requirements specified.

1.3 OWNERSHIP AND USE OF DOCUMENTS

- 1.3.1 All Drawings, Specifications and copies thereof furnished by the Design Consultant are and shall remain the property of the Owner. They are to be used by Contractor only with respect to the Project and are not to be used by Contractor on any other project. With the exception of one contract set for each party to the Contract, such documents are to be returned or suitably accounted for to the Owner on request at the completion of the Work. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of Owner's rights or the Design Consultant's common law copyright or other reserved rights. The Contractor will be furnished with 1 set(s) of paper drawings and specifications for free.

ARTICLE 2

THE DESIGN CONSULTANT

2.1 DEFINITIONS

- 2.1.1 The term "Design Consultant" or "A/E" or "Architect" or "Engineer" as used or set forth in the Contract Documents, shall mean the entity and its consultants or agents, or their duly authorized representatives, that is responsible for designing or engineering the Work, and performing the activities specified herein, and in the Agreement for Design Consultant Services, including any

consultants to said entity or firm acting within the scope of their agreements with the Design Consultant. Such firm or agency and its representatives shall act severally within the scope of particular duties entrusted to them, unless otherwise provided for in the Contract Documents or in the Agreement for Design Consultant Services.

2.1.2 The Design Consultant may be identified in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The Design Consultant is further described as and, throughout this document, shall mean one or both of the following:

2.1.2.1 ARCHITECT, a person or other legal entity lawfully licensed to practice architecture in the State wherein the Project is located; or

2.1.2.2 ENGINEER, a person or other legal entity lawfully licensed to practice engineering in the State wherein the Project is located.

2.2 SERVICES OF THE DESIGN CONSULTANT

2.2.1 The Design Consultant will provide certain services as hereinafter described and further described in the Agreement for Design Consultant Services.

2.2.2 Should errors, omissions, or conflicts in the Drawings, Specifications, or other Contract Documents prepared by or on behalf of the Design Consultant be discovered, the Design Consultant will prepare such amendments or supplementary documents and provide consultation as may be required.

2.2.3 The Design Consultant will visit the site at intervals appropriate to the stage of construction to familiarize itself generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. The Design Consultant will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work, but it shall make as many inspections as may reasonably be required to fulfill its obligations to the Owner. On the basis of such on-site observations, the Design Consultant and his consultants shall endeavour to guard the Owner against defects and deficiencies in the Work.

2.2.3.1 The Design Consultant will conduct the construction meetings and shall be responsible for preparing accurate and complete minutes of all such meetings and other Project meetings and distributing same to all participants. The meetings shall be held on a bi-weekly basis. The Design Consultant shall chair the meeting and prepare and distribute minutes of each such meeting to the Contractor and Owner as soon after the meeting as practical, but in any case within seven (7) days of the meeting. The purpose of the meetings will be to review the status of the Project and to address such other matters relating to the Project as an Owner, Design Consultant and Contractor deem appropriate, including remedial actions that may be necessary to ensure required progress and completion in accordance with the construction schedule and Contract time.

2.2.3.2 The Design Consultant shall review construction schedules prepared by the Contractor, as well as coordination of construction performed by separate contractors or by the Owner's own forces, including equipment supplied by the Owner.

2.2.4 The Design Consultant will render written field reports to the Owner in the form required by the Owner relating to the periodic visits and inspections of the Project required by Paragraph

- 2.2.3.
- 2.2.5 The Design Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Design Consultant will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any portion of the Work.
- 2.2.6 The Design Consultant and Owner shall at all times have access to the Work wherever it is in preparation or progress. The Contractor shall provide safe facilities for such access so the Design Consultant and Owner may perform their functions under the Contract Documents.
- 2.2.7 As required, the Design Consultant will render to the Owner, within a reasonable time, interpretations concerning the design and other technical aspects of the Work and the Contract Documents.
- 2.2.8 All communications, correspondence, submittals, and documents exchanged between the Design Consultant and the Contractor in connection with the Project shall be through the Owner or in the manner prescribed by the Owner. Further, all communications, correspondence, submittals and documents transmitted from the Owner or Design Consultant will be directed to the Contractor and copied to the Owner or Design Consultant.
- 2.2.9 All interpretations and decisions of the Design Consultant shall be consistent with the intent of and reasonably inferable from the Contract Documents.
- 2.2.10 The Design Consultant's decisions in matters relating to artistic effect will be final if consistent with the intent of the Contract Documents.
- 2.2.11 If the Design Consultant observes any Work that does not conform to the Contract Documents, the Design Consultant shall report this observation to the Owner. The Design Consultant will prepare and submit to the Owner "punch lists" of the Contractor's work, which is not in conformance with the Contract Documents. The Owner will transmit such "punch lists" to the Contractor.
- 2.2.12 The Design Consultant has the authority to condemn or reject any or all of the Work on behalf of the Owner when, in its opinion, the Work does not conform to the Contract Documents. Whenever, in the Design Consultant's reasonable opinion, it is considered necessary or advisable for the implementation of the intent of the Contract Documents, the Design Consultant will have the authority to require special inspection or testing of any portion of the Work in accordance with the provisions of the Contract Documents whether or not such portion of the Work be then fabricated, installed or completed.
- 2.2.13 The Design Consultant will review the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and for general compliance with the Contract Documents. Such action shall be taken within fourteen (14) days of receipt unless otherwise authorized by the Owner.
- 2.2.14 The Owner will establish with the Design Consultant procedures to be followed for review and processing of all Shop Drawings, catalogue submittals, project reports, test reports, maintenance manuals, and other necessary documentation, as well as requests for changes and applications

for extensions of time.

- 2.2.15 The Design Consultant will prepare Change Orders and Construction Change Directives when requested by the Owner.
- 2.2.16 The Design Consultant and the Owner will conduct inspections to determine the dates of Substantial Completion and Final Completion. The Design Consultant will issue a final Certification of Payment.
- 2.2.17 The Design Consultant will prepare three (3) printed copies and one (1) electronic computer file compatible with the latest version of AutoCAD, or other program designated by Owner, showing significant Changes in the Work made during the construction process, based on neatly and clearly marked-up Drawings, prints, and other data furnished by the Contractor(s) and the applicable Addenda, clarifications and Change Orders which occurred during the Project. The Design Consultant will also provide the Owner assistance in the original operation of any equipment or system such as initial start-up, testing, adjusting, and balancing.
- 2.2.18 In case of the termination of the employment of the Design Consultant, the Owner may appoint a Design Consultant whose status under the Contract Documents shall be that of the former Design Consultant.

ARTICLE 3

OWNER

3.1 DEFINITION

- 3.1.1 The Owner is the person or entity identified as such in the Owner-Contractor Agreement and may be referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means the Owner or his authorized representative or agent. The phrase "Owner or its agent" as used in this Agreement, does not include the Separate Contractors or their Subcontractors.

3.2 INFORMATION, SERVICES AND RIGHTS OF THE OWNER

- 3.2.1 The Owner will provide administration of the Contract as herein described. The Design Consultant shall also provide aspects of administration of the Contract as herein described or as specified in the Agreement for Design Consultant Services.
- 3.2.2 The Owner shall at all times have access to the Work whenever it is in preparation or progress. The Contractor shall provide safe facilities for such access.
- 3.2.3 The Owner shall not be responsible for or have control or charge of the construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, and will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.
- 3.2.4 The Owner will have authority to require special inspection or testing of portions of the Work to the same extent as the Design Consultant in accordance with Paragraph 2.2.12 whether or not such portion of the Work be then fabricated, installed, or completed. However, neither the Owner's authority to act under Paragraph 3.2.4, nor any decision made by the Owner in good faith either to exercise or not to exercise such authority shall give rise to any duty or

responsibility of the Owner to the Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the Work.

- 3.2.5 The Owner shall have the authority and discretion to call, schedule, and conduct job meetings to be attended by the Contractor, representatives of his Subcontractors, and the Design Consultant, to discuss such matters as procedures, progress, problems, and scheduling.
- 3.2.5.1 The Contractor is requested and required to attend weekly job site progress conferences as called by the Design Consultant. The Contractor shall be represented at these job progress conferences by project personnel authorized by the Contractor to make schedule and financial decision and by project personnel representatives. These meetings shall be open to Subcontractors, Material Suppliers, and any others who can contribute shall be encouraged by the Contractor to attend. It shall be the principal purpose of these meetings, or conferences, to affect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the Project on schedule and to complete the Project within the specified Contract Time. The Contractor shall be prepared to assist progress of the Work as required in his particular contract and to recommend remedial measures for the correction of progress as may be appropriate. The Design Consultant shall be the coordinator of the conferences and shall preside as chairman.
- 3.2.5.2 If the Project is awarded as a single prime construction contract, the Design Consultant shall determine which, if any, Subcontractors and/or Material Suppliers shall be required to attend weekly job site progress conferences. The Contractor shall comply with this request and the meeting shall be conducted as described in Subparagraph 3.2.5.1.
- 3.2.6 The Owner will establish procedures to be followed for processing all Shop Drawings, catalogues, and other project reports, and other documentation, test reports, and maintenance manuals.
- 3.2.7 The Owner and Design Consultant will review all requests for changes and shall implement the processing of Change Orders, including applications for extension of the Contract Time.
- 3.2.8 The Owner, will not be responsible for the failure of the Contractor to plan, schedule, and execute the Work in accordance with the approved schedule or the failure of the Contractor to meet scheduled Completion Dates or the failure of the Contractor to schedule and coordinate the Work of his own trades and Subcontractors or to coordinate and cooperate with any Separate Contractors.
- 3.2.9 The Owner, in consultation with the Design Consultant, will review and process all Applications for Payment by the Contractor, including the final Application for Payment.
- 3.2.10 The Owner and Design Consultant shall not be responsible or liable to Contractor for the acts, errors or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons performing any of the Work or working on the Project.
- 3.2.11 The Owner shall furnish surveys describing the physical characteristics and legal limitations for the site of the Project, which are in its possession and are relevant to the Work.
- 3.2.12 The Owner shall secure and pay for necessary easements, required for permanent structures or for permanent changes in existing facilities.
- 3.2.13 The Owner shall furnish information or services under the Owner's control with reasonable promptness to avoid unreasonable delay in the orderly progress of the Work.

- 3.2.14 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, copies of Drawings and Specifications in accordance with the Supplemental Conditions.
- 3.2.15 The Owner will make reasonable efforts to make available for the Contractor's reasonable review, at the Owner's offices or together with the Contract Documents, certain boring logs, geotechnical, soils and other reports, surveys and analyses pertaining to the Project site of which the Owner is aware, has in its possession and are relevant to the Work. Any boring logs that are provided to the Contractor are only intended to reflect conditions at the locations of the borings and do not necessarily reflect site conditions at other locations. Any reports, surveys and analyses provided by Owner are for the Contractor's information only, and their accuracy and completeness are not guaranteed or warranted by the Owner or the Design Consultant, and such reports are not adopted by reference into, nor are they part of the Contract Documents. Notwithstanding any factual statement, conclusion, or any language or recommendations contained in such reports, the Contractor assumes full responsibility for inspection of the site and determination of the character, quality and quantity of any soil, surface or subsurface conditions that may be encountered or which may affect the Work, and for the means and methods of construction that he employs when performing the Work.
- 3.2.16 The foregoing rights are in addition to other rights of the Owner enumerated herein and those provided by law.

3.3 OWNER'S RIGHT TO STOP OR TO SUSPEND THE WORK

- 3.3.1 If the Contractor fails to correct defective Work as required by Section 13.2 or fails to carry out the Work or supply labor and materials in accordance with the Contract Documents, the Owner by a written Notice may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.
- 3.3.2 The Owner may order the Contractor in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as he may determine to be appropriate for the convenience of the Owner.
- 3.3.3 If the performance of all or any part of the Work (including the work of the Contractor and its Subcontractors) is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Owner or the Design Consultant, or by failure of any one of them to act within the time specified in this Contract (or if no time is specified, within a reasonable time), an adjustment shall be made for an increase in the actual time required for performance of the Work by the Contractor, due solely to such unreasonable suspension, delay, or interruption and the Contract modified in writing accordingly. However, no Claim shall be made under this Paragraph for any suspension, delay, or interruption pursuant to Paragraph 3.4.1, or for which Claim is provided or excluded under any other provision of this Contract. No Claim under this Paragraph shall be allowed on behalf of the Contractor or its Subcontractors, unless within twenty (20) days after the act or failure to act involved, and for continuing or ongoing acts or failures to act within twenty (20) days of the first day of the act or failure to act, the Contractor submits to the Owner a written statement setting forth, as fully as then practicable, the extent of such Claim, and unless the Claim is asserted in writing within thirty (30) days after the termination of such suspension, delay, or interruption. For continuing or ongoing acts or failures to act, the Contractor shall update its written statement every twenty (20) days until the suspension, delay or interruption is terminated. The Contractor shall waive any and all Claims

under this Paragraph 3.3.3 which are not filed in strict conformance with Paragraph 3.3.3. The Contractor shall indemnify, defend and hold the Owner harmless from any Claim by a Subcontractor that is waived because it is not filed in strict conformance with this Paragraph 3.3.3 or any other provision of the Contract regarding Claims.

3.3.4 In the event of a suspension of the Work or delay or interruption of the Work per Paragraph 3.3.3, the Contractor will and will cause his Subcontractors to protect carefully his, and their, materials and Work against damage, loss or injury from the weather and maintain completed and uncompleted portions of the Work as required by the Contract Documents. If, in the opinion of the Owner, any Work or material shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors to so protect same, such Work and materials shall be removed and replaced at the expense of the Contractor.

3.3.5 No Claim by the Contractor under Paragraph 3.3.3 shall be allowed if asserted after final payment under this Contract or if it is not asserted in strict conformance with Paragraph 3.3.3.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

3.4.1 If the Contractor defaults or otherwise neglects to carry out the Work in accordance with the Contract Documents and fails within ten (10) days after the date written Notice is given by the Owner, with a copy of such Notice sent to the Contractor's Surety, to commence and continue remedy of such default or neglect with diligence and promptness, the Owner may, without prejudice to any other remedy he may have, make good such deficiencies and may further elect to complete all Work thereafter through such means as the Owner may select, including the use of a new contractor pursuant to Paragraph 3.4.2. In such case, the Owner shall provide Notice to the Contractor's Surety and an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Design Consultant's additional services made necessary by such default, neglect or failure and any other damages suffered by Owner as a result of Contractor's breach, including but not limited to Owner's reasonable attorney's fees and litigation costs and expenses. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor or its Surety shall pay the difference to the Owner. Notwithstanding the Owner's right to carry out a portion of the Work, warranty, maintenance and protection of the Work remains the Contractor's and Surety's responsibility. Further, the provisions of this Paragraph do not affect the Owner's right to require the correction of defective or non-conforming Work in accordance with Section 13.2.

3.4.2 Whenever the Contractor shall be, and declared by the Owner to be in default under the Contract, the Owner having substantially performed Owner's obligations thereunder, the Surety shall promptly remedy the default, or shall be liable to Owner for damages pursuant to the Performance Bond and as provided by law. Any action by Surety or by Owner against the Surety shall not relieve Contractor of its duties, responsibilities and liabilities to Owner pursuant to the Contract or as allowed by law.

ARTICLE 4

CONTRACTOR

4.1 DEFINITION

4.1.1 The Contractor is the person or organization identified as such in the Owner-Contractor Agreement and may be referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative, who shall have authority to bind the Contractor in all matters pertinent to the Contract.

4.1.2 The Contract is not one of agency by the Contractor for Owner but one in which Contractor is engaged independently in the business of providing the services and performing the Work herein described as an independent contractor.

4.2 REVIEW OF CONTRACT DOCUMENTS

4.2.1 The Contractor represents that prior to executing this Contract, the Contractor carefully reviewed and studied the Contract Documents and notified the Owner and Design Consultant of any errors, inconsistencies or omissions of which the Contractor is aware. The Contractor agrees to continuously and carefully study and compare the Contract Documents after the execution of this Contract and shall at once report to the Owner and Design Consultant any error, inconsistency or omission he may discover, including, but not limited to, any requirement which may be contrary to any law, ordinance, rule, regulation, building code, or order of any public authority bearing on the Work. If the Contractor has reported in writing an error, inconsistency or omission, has promptly stopped the affected Work until otherwise instructed, and has otherwise followed the instructions of the Owner, the Contractor shall not be liable to the Owner or the Design Consultant for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents. The Contractor shall perform no portion of the Work at any time without it being specified in Contract Documents and, where required, approved Shop Drawings, Product Data or Samples for such portion of the Work.

4.2.2 The Contractor and his Subcontractors shall keep at the site of the Work at least one copy of the Drawings and Specifications and shall at all times give the Owner, the Design Consultant, inspectors, as well as other representatives of the Owner access thereto.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for and have control over all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

4.3.1.1 It shall be the Contractor's responsibility to schedule the Work; to maintain a progress schedule for the Project; and to notify the Design Consultant and the Owner of any changes in the progress schedule. He shall be responsible for providing adequate notice to all Subcontractors to insure efficient continuity of all phases of the Project. The Contractor is responsible for keeping the Owner and Design Consultant fully informed as to the work progress, including immediate notification of any work progress changes.

4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and Sub-subcontractors, Suppliers, their agents and employees, and other

persons performing any of the Work and for their compliance with each and every requirement of the Contract Documents, in the same manner as if they were directly contracted by the Contractor.

- 4.3.3 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the acts, failures to act or duties of the Owner or the Design Consultant in their administration of the Contract, or by inspections, tests or approvals (or the lack thereof) required or performed under Section 7.6 by persons other than the Contractor.
- 4.3.4 Before starting a section of the Work, the Contractor shall carefully examine all preparatory work that has been executed to receive his work to see that it has been completed in accordance with the Contract Documents. He shall check carefully, by whatever means are required, to ensure that his work and adjacent, related work will finish to proper and required standards for quality, contours, planes, and levels.
- 4.3.5 The Contractor understands and agrees that the Owner and Design Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and they will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Owner and the Design Consultant will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.
- 4.3.6 The Contractor shall not use or provide Subcontractor equipment, materials, methods or persons to which Owner and Design Consultant have a reasonable objection and shall remove no portion of the Work or stored materials from the site of the Work, except for defective Work the Contractor may be required to replace or repair as set forth herein.
- 4.3.7 The Contractor shall verify all grades, lines, levels and dimensions as indicated and shown on the Drawings and in the Specifications prior to beginning any portion of the Work and shall immediately report in writing any errors or inconsistencies to the Design Consultant before commencing that portion of the Work.

4.4. CONTRACTOR'S REPRESENTATIONS

- 4.4.1 By entering into this Contract with the Owner, the Contractor represents and warrants the following, together with all other representations and warranties in the Contract Documents:
 - .1 That he is experienced in and competent to perform the type of work required and to furnish the Subcontractors, materials, supplies, equipment and services to be performed or furnished by him;
 - .2 That he is financially solvent, able to pay his debts as they mature, and possessed of sufficient working capital to initiate and complete the Work required under the Contract;
 - .3 That he is familiar with all Federal, State, County, municipal and department laws, ordinances, permits, regulations, building codes and resolutions which may in any way affect the Work or those employed therein, including but not limited to any special laws or regulations relating to the Work or any part thereof;
 - .4 That such temporary and permanent Work required by the Contract Documents will be

satisfactorily constructed and fit for use for its intended purpose and that such construction will not injure any person, or damage any property;

- .5 That he has carefully examined the Contract Documents and the site of the Work and that from his own investigations, he has satisfied himself and made himself familiar with: (1) the nature and location of the Work; (2) the character, quality and quantity of surface and subsurface materials likely to be encountered, including, but not limited to, all structures and obstructions on or at the Project site, both natural and man-made; (3) the character of equipment and other facilities needed for the performance of the Work; (4) the general and local conditions including without limitation its climatic conditions, the availability and cost of labor and the availability and cost of materials, tools and equipment; (5) the quality and quantity of all materials, supplies, tools, equipment, labor and professional services necessary to complete the Work in the manner required by the Contract Documents; and (6) all other matters or things which could in any manner affect the performance of the Work;
- .6 That he will fully comply with all requirements of the Contract Documents;
- .7 That he will perform the Work consistent with good workmanship, sound business practice, and in the most expeditious and economical manner consistent with the best interests of the Owner;
- .8 That he will furnish efficient business administration and experienced project management and supervision, and an adequate supply of workers, equipment, tools and materials at all times;
- .9 That he has carefully reviewed the Work required and that the Work can be planned and executed in a normal and orderly sequence of Work and reasonably scheduled so as to ensure completion of the Work in accordance with the Contract Documents, allowing for normal and reasonably foreseeable weather, labor and other delays, interruptions and disruptions of the Work;
- .10 That he will complete the Work within the Contract Time and all portions thereof within any required Completion Dates;
- .11 That his Contract Sum is based upon the labor, materials, systems and equipment required by the Contract Documents, without exception;
- .12 That he will make a good faith effort to utilize Historically Underutilized Businesses (HUB's) per N.C. Gen. Stat. 143-128.2, and as described in the construction documents; and
- .13 That he will coordinate construction activities to ensure that operations are carried out with due consideration given to conservation of energy, water and materials.

4.5 LABOR AND MATERIALS

- 4.5.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, supplies, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary or proper for or incidental to the execution and completion of the Work required by and in accordance with the Contract Documents and any applicable code or statute, whether specifically required by the

Contract Documents or whether their provision may reasonably be inferred as necessary to produce the intended results, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Final payment will not be made until the Work is so completed and Contractor has otherwise complied with the Contract Documents in full.

4.5.2 The Contractor shall at all times enforce strict discipline and good order among his employees and Subcontractors performing any of the Work and shall not employ or contract with on the Work any unfit person or entity or anyone not skilled in the task assigned to him. The Owner may, by Notice, require the Contractor to remove from the Work any employee or employee of a Subcontractor performing any of the Work, that the Owner deems incompetent, careless or otherwise objectionable.

4.5.3 The Contractor shall be responsible for ensuring that the Work is completed in a skillful and workmanlike manner.

4.5.4 All equipment, apparatus and/or devices of any kind to be incorporated into the Work that are shown or indicated on the Drawings or called for in the Specifications or required for the completion of the Work shall be entirely satisfactory to the Owner and the Design Consultant as regards operations, capacity and/or performance. No approval, either written or verbal, of any drawings, descriptive data or samples of such equipment, apparatus and/or device shall relieve the Contractor of his responsibility to turn over the same in good working order for its intended purpose at the completion of the Work in complete accordance with the Contract Documents. Any equipment, apparatus and/or device not fulfilling these requirements shall be removed and replaced by proper and acceptable equipment, etc. or put in good working order satisfactory to the Owner and Design Consultant without additional cost to the Owner.

4.6 WARRANTY

4.6.1 The Contractor warrants to the Owner and the Design Consultant that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all workmanship will be in accordance with generally accepted industry standards, free from faults and defects and in conformance with the Contract Documents and all other warranties and guaranties specified therein. Where no standard is specified for such workmanship or materials, they shall be the best of their respective kinds. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Owner or the Design Consultant, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Article 13.

4.6.2 The Contractor will be required to complete the Work specified and to provide all items needed for construction of the Project, complete and in good order.

4.6.3 The warranties set forth in this Section 4.6 and elsewhere in the Contract Documents shall survive Final Completion of the Work under Section 9.9.

4.6.4 The Contractor guarantees and warrants to the Owner all Work as follows:

- .1 That all materials and equipment furnished under this Contract will be new and the best of its respective kind unless otherwise specified;
- .2 That all Work will be in accordance with generally accepted industry standards and free of omissions and faulty, poor quality, imperfect and defective material or workmanship;

- .3 That the Work shall be entirely watertight and leak proof in accordance with all applicable industry customs and practices, and shall be free of shrinkage and settlement;
 - .4 That the Work, including but not limited to, mechanical and electrical machines, devices and equipment, shall be fit and fully usable for its intended and specified purpose and shall operate satisfactorily with ordinary care;
 - .5 That consistent with requirements of the Contract Documents, the Work shall be installed and oriented in such a manner as to facilitate unrestricted access for the operation and maintenance of fixed equipment;
 - .6 That the Work will be free of abnormal or unusual deterioration which occurs because of poor quality materials, workmanship or unsuitable storage; and
 - .7 That the products or materials incorporated in the Work will not contain asbestos.
- 4.6.5 All Work not conforming to guarantees and warranties specified in the Contract Documents, including substitutions not properly approved and authorized, may be considered defective. If required by the Design Consultant or Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.
- 4.6.5.1 The Contractor will submit a written affidavit certifying that none of the materials incorporated in the Project contain asbestos.
- 4.6.6 If, within one (1) year after the date of Substantial Completion of the Work or designated portion thereof as defined in Paragraph 8.1.3 or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective, not in accordance with the Contract Documents, or not in accordance with the guarantees and warranties specified in the Contract Documents, the Contractor shall correct it within five (5) working days or such other period as mutually agreed, after receipt of Notice from the Owner to do so. The Owner shall give such Notice with reasonable promptness after discovery of the condition. For items that remain incomplete or uncorrected on the date of Substantial Completion, the one (1) year warranty shall begin on the date of Final Completion of the Work or upon correction of the defective Work.
- 4.6.6.1 The Contractor further warrants that for a period of twenty-four (24) months following the date of Substantial Completion that the building shall be watertight and leak free in every area. The Contractor shall, immediately upon notification by the Owner of water infiltration, determine the source of the water infiltration and, at the Contractor's own expense, do any work necessary to make the building watertight. The Contractor shall also, at the Contractor's own expense, repair or replace any other damaged material to return the building to its original accepted condition.
- 4.6.6.2 In the event Substantial Completion is achieved in stages, all applicable warranties will begin on the date the last portion of the Project achieved Substantial Completion.
- 4.6.7 If at any time deficiencies in the Work are discovered which are found to have resulted from fraud or misrepresentation, or an intent or attempt to or conspiracy to defraud the Owner by the Contractor, any Subcontractor or Supplier, the Contractor will be liable for replacement or correction of such Work and any damages which Owner has incurred related thereto, regardless of the time limit of any guarantee or warranty.

- 4.6.8 Any materials or other portions of the Work, installed, furnished or stored on site which are not of the character or quality required by the Specifications, or are otherwise not acceptable to the Design Consultant or the Owner, shall be immediately removed and replaced by the Contractor to the satisfaction of the Design Consultant and Owner, when notified to do so by the Design Consultant or Owner.
- 4.6.9 If the Contractor fails to correct defective or non-conforming Work as required by Paragraph 4.6.6, or if the Contractor fails to remove defective or non-conforming Work from the site, as required by Paragraph 4.6.8, the Owner may elect to either correct such Work in accordance with Section 3.4 or remove and store materials and equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten (10) days thereafter, the Owner may upon ten (10) additional days written Notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Design Consultant's additional services and Owner's reasonable attorney's fees made necessary thereby. If such proceeds of sale do not cover all costs, which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.
- 4.6.9.1 If the Contractor, after notice, fails within 48 hours to develop and transmit a proposed plan of remedial action to the Design Consultant and Owner for correction of warranty items, and/or fails to proceed within three (3) days to commence corrective measures of warranty items in compliance with the terms of the warranty/guarantee, the Owner may have the defects corrected and the Contractor and surety shall be liable for all expense incurred.
- 4.6.10 The Contractor shall bear the cost of making good all of the Work of the Owner, Separate Contractors or others, destroyed or damaged by such correction or removal required under this Article 4, Article 13 or elsewhere in the Contract Documents.
- 4.6.11 In the event the manufacturer does not have a suitable written warranty form to fully cover the guarantee requirements as set forth in the Specifications, the Contractor shall arrange for the manufacturer to provide a written warranty in such form as shall fully document the guarantee set forth in the Specifications.
- 4.6.12 The Contractor shall provide to the Owner all material, equipment, or other special warranties required by the Contract Documents within thirty (30) days after the date of Substantial Completion. All warranties shall be issued in the name of the Owner, or shall be transferable to the Owner, shall be in a form satisfactory to the Owner, and shall commence in accordance with Article 4.6.
- 4.6.13 The warranties contained herein shall not limit the Contractor's responsibility for the correction of defective or deficient work on the Project.
- 4.7 TAXES
- 4.7.1 The Contractor shall pay all sales, consumer, use and other similar taxes for the Work or portions thereof provided by the Contractor which are legally enacted at the time the Owner received bids for the construction of the Project, whether or not yet effective.
- 4.7.2 Sales and Use Tax. Contractor shall be responsible for complying with any applicable sales and

use tax obligations imposed by Chapter 105, Article 5 of the North Carolina General Statutes. Where Contractor has been contracted with to oversee “new construction” or “reconstruction” as defined in G.S. 105-164.4H, Contractor shall be responsible for issuing and maintaining an Affidavit of Capital Improvement.

4.8 PERMITS, FEES AND NOTICES

4.8.1 The Owner shall be responsible for fees associated with permits and approval of the Drawings including but not limited to building permit, utility impact fees, stormwater permit and driveway permit.

4.8.2 The Contractor is responsible for all fees, permits and other costs associated with temporary utilities, including but not limited to installation, use, disconnection, removal and/or relocation.

4.8.3 The Contractor will pay for his own license, inspection and re-inspection fees for the proper execution and completion of the Work.

4.8.4 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work, including but not limited to all applicable building codes. If Contractor believes that any part of the Drawings or Specifications are inconsistent with applicable laws, rules, regulations, lawful orders of public authorities or building codes, Contractor shall Notify the Owner and Design Consultant of such inconsistencies immediately.

4.9 ALLOWANCES

4.9.1 The Contractor shall include in the Contract Sum all Allowances stated in the Contract Documents. Items covered by these Allowances shall be supplied for such amount and by such persons as the Owner may direct, but the Contractor will not be required to employ persons against whom he makes a reasonable objection.

4.9.2 Unless otherwise provided in the Contract Documents:

- .1 Allowances for Work: These allowances shall cover the cost to the Contractor for the materials and equipment required by the allowance delivered at the site, all applicable taxes, unloading, uncrating and storage, protection from elements, labor, installation and finishing and other expenses required to complete the installation, and a fixed percentage for overhead and profit as defined in Article 12.
- .2 Allowances for Products/Materials: Allowance includes the cost of the product, delivery to the site and applicable taxes. The Contractor's costs for unloading and handling on the site, labor, installation, overhead, profit and other expenses contemplated for the material allowance shall be included in the Contract Sum and not in the allowance;
- .3 Whenever the cost is more than or less than the Allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit and other expense.

4.10 SUPERINTENDENT

4.10.1 The Contractor shall employ, and have approved by the Owner, a competent superintendent and

necessary assistants who shall be in attendance at the Project site during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. If the Contractor employs more than a single individual in this role, the Owner shall be provided an organizational chart and personnel listing for the staff performing the functions of a superintendent. In such event, all references to the superintendent elsewhere in the Contract Documents shall mean the staff performing the functions of a superintendent.

4.10.2 The superintendent shall be in attendance at the Project site not less than eight (8) hours per day, five (5) days per week, unless the job is closed down due to conditions beyond the control of the Contractor or until termination of the Contract in accordance with the Contract Documents. It is understood that such superintendent shall be acceptable to the Owner and shall be the one who will be continued in that capacity for the duration of the Project, unless he ceases to be on the Contractor's payroll or the Owner otherwise agrees. The superintendent shall not be employed on any other project for or by Contractor or any other entity during the course of the Work.

4.11 PROGRESS SCHEDULE

4.11.1 The Contractor shall prepare and submit to the Owner for the Owner's review and approval an estimated progress schedule for the Work. The estimated project schedule shall be submitted within 10 days of being awarded the Project by the Owner.

4.11.2 The Contractor shall provide a project Critical Path Method (CPM) Construction Schedule in an electronic format for the entire Project. The schedule will be in such format as directed by Owner and Design Consultant. The Project schedule will be reviewed/updated on at least a monthly basis. The schedule will be utilized for monitoring the progress of the Project. The schedule will contain the Schedule of Values to be used as a basis for reviewing the amount of monthly progress payments to be made to the Contractor. The CPM schedule shall be submitted and approved prior to the Design Consultant's approval of any Applications for Payment, except for the reimbursement of the Contractor's cost for bonds and insurance.

4.12 RESPONSIBILITY FOR COMPLETION

4.12.1 The Contractor shall furnish such manpower, materials, facilities and equipment and shall work within the normal scheduled working hours to ensure the performance of the Work within the Completion Dates specified in the Owner-Contractor Agreement. If for any reason the Contractor must work outside of the normal scheduled working hours, a custodian employed by the Owner is required to be in attendance when accessing the work area. The Contractor agrees to reimburse the Owner for such custodian's time. The reimbursement is due with the subsequent payment application.

4.12.2 If it becomes apparent to the Design Consultant or Owner that the Work will not be completed within required Completion Dates, the Contractor agrees to undertake some or all of the following actions, at no additional cost to the Owner, in order to ensure, in the opinion of the Design Consultant and Owner, that the Contractor will comply with all Completion Date requirements:

- .1 Increase manpower, materials, crafts, equipment and facilities;
- .2 Increase the number of working hours per shift, shifts per working day, working days per week, or any combination of the foregoing, including but not limited to night shifts,

overtime operations and Sundays and holidays;

- .3 Reschedule activities to achieve maximum practical concurrence of accomplishment of activities;
 - .4 Require that his superintendent be at the Project site not less than ten (10) hours per day, six (6) days per week; and
 - .5 Reimburse the Owner in accordance with Paragraph 4.12.1 above for all work performed outside of the normal scheduled work hours.
- 4.12.3 In undertaking the actions required under Paragraph 4.12.1, Contractor shall prepare and adhere to a recovery schedule if the Project is behind schedule by four (4) or more days.
- 4.12.4 If the actions taken by the Contractor are not satisfactory, the Design Consultant or Owner may direct the Contractor to take any and all actions necessary to ensure completion within the required Completion Dates, without additional cost to the Owner. In such event, the Contractor shall continue to assume responsibility for his performance and for completion within the required dates.
- 4.12.5 If, in the opinion of the Design Consultant or Owner, the actions taken by the Contractor pursuant to this Article or the progress or sequence of the Work are not accurately reflected on the construction schedule, the Contractor shall revise such schedule to accurately reflect the actual progress and sequence of the Work. The Contractor shall perform the Work in general accordance with the most recent schedule approved by the Owner and Design Consultant.
- 4.12.6 Failure of the Contractor to substantially comply with the requirements of this Article, may be considered grounds for a determination by the Owner, pursuant to Article 14, that the Contractor is failing to prosecute the Work with such diligence as will ensure its completion within the time specified.
- 4.12.7 The Owner may, at its sole discretion and for any reason, other than due to the fault of Contractor require the Contractor to accelerate the Work by providing overtime, Saturday, Sunday and/or holiday work and/or by having all or any Subcontractors designated by the Owner provide overtime, Saturday, Sunday, and/or holiday work. In the event that the Owner requires such acceleration a Change Order shall be issued in accordance with Article 12.
- 4.12.8 This Section 4.12 does not eliminate the Contractor's responsibility to comply with the local noise ordinances, all highway permit requirements and all other applicable laws, regulations, rules, ordinances, resolutions, and permit requirements.
- 4.13 DOCUMENTS AND SAMPLES AT THE SITE
- 4.13.1 The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be delivered to the Design Consultant upon completion of the Work.
- 4.14 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
- 4.14.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the

Work by the Contractor or any Subcontractor, Manufacturer, Supplier or distributor to illustrate some portion of the Work.

- 4.14.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.
- 4.14.3 Samples are physical examples, which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
- 4.14.4 Manuals are manufacturer's installation, start-up, operating, and maintenance and repair instructions together with parts lists, pictures, sketches and diagrams, which set forth the manufacturer's requirements for the benefit of the Contractor and the Owner.
- 4.14.5 The Contractor shall prepare or have prepared at its expense and shall review, indicate approval thereupon, and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the other work of the Owner or any Separate Contractor, all Shop Drawings, Product Data, Manuals and Samples required by the Contract Documents.
 - 4.14.5.1 Unless otherwise directed in writing, the Contractor shall submit no less than three (3) copies of each Shop Drawing, Product Data, or Manuals to the Design Consultant. Routing of said submittals will be from the Contractor to the Design Consultant with a copy of the transmittal to the Owner. The Design Consultant will return one (1) copy of the reviewed submittal to the Contractor.
 - 4.14.5.2 Where the Contract calls for the submittal of manufacturer's data to the Design Consultant for information only, such submittals shall be made before the commencement of any portion of the Work requiring such submission. Work performed without benefit of approved Shop Drawings for any portion of the Work is subject to removal and replacement at no cost to the Owner.
 - 4.14.5.3 For standard manufactured items not requiring special Shop Drawings for manufacture, Contractor shall submit no less than three (3) copies of Manufacturer's catalogue sheets showing illustrated cuts of item to be furnished, scale details, sizes, dimensions, performance characteristics, capacities, wiring diagrams and controls, and all other pertinent information. One (1) copy of reviewed submissions will be returned to the Contractor.
 - 4.14.5.4 Unless otherwise directed in writing, all other Shop Drawings, Contractor shall submit no less than three (3) legible copies of each drawing. Each drawing shall have a clear space for stamps. When phrase "by others" appears on Shop Drawings, the Contractor shall indicate on the Shop Drawing who is to furnish material or operations so marked before submittal. When the Shop Drawings are checked "revise and resubmit", the Contractor shall make corrections and submit new copies for review. The Shop Drawings shall contain the Contractor's "approval" and corrections.
 - 4.14.5.5 For use of all trades, the Contractor shall provide such number of Shop Drawings as is required for field distribution.
 - 4.14.5.6 The Design Consultant will review submittals and make marks to indicate corrections or revisions required and will stamp each submittal with an action stamp and will mark the stamp with the action required by the Contractor.

- 4.14.5.7 Contractor shall submit names of proposed Manufacturers, Material Suppliers, dealers, who are to furnish materials, fixtures, appliances or other fittings for approval as early as possible, to afford proper investigation and checking.
- 4.14.5.8 Transactions with manufacturers, or Subcontractors, shall be through Contractor.
- 4.14.5.9 Unless otherwise specified, Contractor shall submit samples in duplicate of adequate size showing quality, type, color range, finish, and texture as indicated in the Specifications.
- 4.14.5.10 Where Specifications require manufacturer's printed installation instructions, Contractor shall submit duplicate copies of such instructions for approval.
- 4.14.5.11 When several materials are specified by name for one use, Contractor shall select for use any of those so specified.
- 4.14.5.12 Whenever item or class of material is specified exclusively by trade name, manufacturer's name, or by catalogue reference, Contractor shall use only such item, unless written approval for substitution is secured, as outlined in the Specifications and in Section 4.15 of the General Conditions.
- 4.14.5.13 Contractor shall not order materials until receipt of written approval. Contractor shall furnish materials equal in every respect to approved samples.
- 4.14.6 By approving and submitting Shop Drawings, Product Data, Manuals and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor shall adhere to any supplementary processing and scheduling instructions pertaining to Shop Drawings, which may be issued by the Design Consultant.
- 4.14.6.1 Parts and details not fully indicated on the Drawings shall be detailed by the Contractor in accordance with standard engineering practice. Dimensions on the Drawings, as well as detailed drawings themselves are subject in every case to measurements of existing, adjacent, incorporated and completed, which shall be taken by the Contractor before undertaking any Work dependent on such data.
- 4.14.7 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Design Consultant's review of Shop Drawings, Product Data, Samples or Manuals under Paragraph 2.2.14 unless the Contractor has specifically informed the Design Consultant in writing of such deviation at the time of submission and the Design Consultant has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility to Owner for errors or omissions in the Shop Drawings, Product Data, Samples, or Manuals by virtue of the Design Consultant's review or approval thereof.
- 4.14.8 The Contractor shall make corrections required by the Design Consultant and shall resubmit the required number of corrected copies of Shop Drawings or new Product Data or Samples. The Contractor shall direct specific attention, in writing on resubmitted Shop Drawings, Product Data or Samples or Manuals, to revisions other than those requested by the Design Consultant on previous submittals. Re-submittals necessitated by required corrections due to Contractor's errors or omissions shall not be cause for extension of Contract Time or an increase in the Contract Sum.

4.14.8.1 No portion of the Work requiring submission of Shop Drawings, Product Data, Samples or Manuals shall be commenced until the submittal has been approved by the Design Consultant as provided in Article 2. All such portions of the Work shall be in accordance with approved submittals.

4.14.9 Shop Drawings, Product Data and Samples shall be dated and shall bear the name of the Project; a description or the names or equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed. Shop Drawings shall be stamped and signed stating that the Contractor has determined and verified all materials, field measurements, and field construction criteria related thereto and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

4.14.10 Submittals of Shop Drawings, Product Data, Samples or Manuals shall be accompanied by a transmittal letter, in duplicate, containing the name of the Project, the Contractor's name, the number of Shop Drawings, Product Data, Samples, or Manuals, identification of Specification section and other pertinent data.

4.15 EQUAL PRODUCTS AND SUBSTITUTIONS

4.15.1 All materials, supplies and articles furnished under the Contract shall, whenever specified and otherwise practicable, be the standard products of recognized, reputable manufacturers. Unless otherwise specifically provided in the Contract Documents, the naming of a certain brand, make, manufacturer or article, device, product, material, fixture or type of construction shall convey the general style, type, character and standard of quality of the article desired and shall not be construed as limiting competition. The Contractor, in such cases, may with Owner's written approval, use any brand, make, manufacturer, article, device, product, material, fixture, form or type of construction which in the judgment of the Design Consultant is equal to that specified. An item may be considered equal to the item so named or described if, in the opinion of the Owner and Design Consultant (1) it is at least equal in quality, durability, appearance, strength, and design; (2) it will perform at least equally the specific function imposed by the general design for the Work being contracted for or the material being purchased; and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the Specifications. Approval by the Owner and Design Consultant will be granted based upon considerations of quality, workmanship, economy of operation, suitability for the purpose intended, warranty and acceptability for use on the Project.

4.15.2 To obtain such approval on makes or brands of material other than those specified in Contract Documents, and not previously approved at the time the Owner received bids for the construction of the Project, the Contractor's request for approval of any substitution shall include:

- .1 Complete data substantiating compliance of the proposed substitution with the Contract Documents;
- .2 Product identification including manufacturers' name, address, and phone number;
- .3 Manufacturer's literature showing complete product description, performance and test data, and all reference standards;
- .4 Samples and colors in the case of articles or products;

- .5 Names and addresses of similar projects on which the product was used and date of installation;
- .6 For construction methods, include a detailed description for the proposed method and drawings illustrating same;
- .7 Itemized comparison of proposed substitution with product or method specified and any cost reduction, which shall benefit the Owner;
- .8 Accurate cost data on proposed substitution in comparison with product or method specified;
- .9 All directions, specifications, and recommendations by manufacturers for installation, handling, storing, adjustment, and operation; and
- .10 Item by item comparison of characteristics of substitution item with those items specified.

4.15.3 The Contractor shall also submit with his request for approval a sworn and notarized statement which shall include all of the following representations by the Contractor, namely that:

- .1 He has investigated the proposed product or method and determined that it is equal or better in all respects to that specified and that it fully complies with all requirements of the Contract Documents;
- .2 He will meet all contract obligations with regard to this substitution;
- .3 He will coordinate installation of accepted substitutions into the Work, making all such changes and any required schedule adjustments, at no additional cost to the Owner, as may be required for the Work to be complete in all respects;
- .4 He waives all Claims for additional costs and additional time related to substitutions, which consequently become apparent. He also agrees to hold the Owner harmless from Claims for extra costs and time incurred by other Subcontractors and suppliers, or additional services which may have to be performed by the Design Consultant, for changes for extra work that may, at some later date, be determined to be necessary in order for the Work to function in the manner intended in the Contract Documents;
- .5 He will provide the same warranty and guarantee, and perform any work required in accordance therewith, for the substitution that is applicable to the specified item for which the substitution is requested;
- .6 Material will be installed, handled, stored, adjusted, tested, and operated in accordance with the manufacturers' recommendation and as specified in the Contract Documents.
- .7 In all cases new materials will be used unless this provision is waived by Notice from the Owner or his Design Consultant, or unless otherwise specified in the Contract Documents;
- .8 All material and workmanship will be in every respect in accordance with that which, in the opinion of the Owner or Design Consultant, is in conformity with approved modern practice; and

- .9 He has provided accurate cost data on the proposed substitution in comparison with the product or method specified.
- 4.15.4 Subject to the provisions of any applicable laws, approval for substitutions or equal products shall be at the sole discretion of the Owner, shall be in writing to be effective, and the decision of the Owner shall be final. The Owner or Design Consultant may require tests of all materials proposed for substitution so submitted to establish quality standards, at the Contractor's expense. After approval of a substitution, if it is determined that the Contractor submitted defective information or data regarding the substitution upon which Owner's approval was based, and that unexpected or unanticipated extensive redesign or rework of the Project will be required in order to accommodate the substitution, or that the substituted item will not perform or function as well as the specified item for which substitution was requested, the Contractor will be required to furnish the original specified item or obtain approval to use another substitution; the Contractor shall pay all costs, expenses or damages associated with or related to the unacceptability of such a substitution and the resultant utilization of another item and no time extension shall be granted for any delays associated with or related to such substitution.
- 4.15.5 If a substitution is approved, no further change in brand or make will be permitted unless satisfactory, written evidence is presented to and approved by the Owner that the manufacturer cannot make scheduled delivery of the approved substituted item. The Owner will not consider substitutions for approval if:
- .1 The proposed substitution is indicated or implied on the Contractor's Shop Drawing or product data submittal and has not been formally submitted for approval by the Contractor in accordance with the above-stated requirements, or
 - .2 Acceptance of the proposed substitution will require substantial design revisions to the Contract Documents or is otherwise not acceptable to the Owner and Design Consultant.
- 4.15.6 Except as otherwise provided for by the provisions of any applicable laws, the Contractor shall not have any right of appeal from the decision of the Owner rejecting any materials submitted if the Contractor fails to obtain the approval for substitution under this Article.
- 4.16 USE OF SITE
- 4.16.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, easements, right-of-way agreements and within the limits of construction as shown on the Contract Documents. The Contractor shall not unreasonably encumber the site, in the opinion of the Owner, with any materials, equipment or trailers nor shall he block the entrances or otherwise prevent reasonable access to the site, other working and parking areas, completed portions of the Work and/or properties, storage areas, areas of other facilities that are adjacent to the worksite. If the Contractor fails or refuses to move said material, equipment or trailers within twenty four (24) hours of notification by the Owner, to so do, the Owner shall have the right, without further notice, to remove, at the Contractor's expense, any material, equipment and/or trailers which the Owner deems are in violation of this Paragraph.
- 4.16.2 The Project, as school property, may attract children and unauthorized personnel. Contractor shall take all necessary precautions to secure the Project and his Work to prevent injury and to discourage entry onto the Project by children and unauthorized personnel.
- 4.16.3 Unless specifically authorized or shown in the plans and specifications for the Project, the Contractor shall not use Owner's facilities and shall plan and schedule its Work so as to not

interrupt or interfere with school operations or activities.

- 4.16.4 The Contractor shall maintain streets, parking areas and sidewalks around the Project site free from any materials or debris resulting from the Work. The Contractor shall remove all spillage and tracking of materials arising from the performance of the Work from such areas and any other affected areas, and shall establish a regular maintenance program of sweeping and hosing to minimize accumulation of dirt, dust and materials upon such areas.
- 4.16.5 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall ensure that at all times the Work is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the Project site and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent of the site of the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.
- 4.16.6 Without limitation of any other provision of the Contract Documents, the Contractor shall minimize any interference with the occupancy or beneficial use of any areas, buildings or facilities on or adjacent to the site of the Work which are occupied or are being used by Owner. To the extent that owner allows Work to be performed in or around occupied buildings or facilities that are not within the limits of construction, it shall be scheduled to be performed at night, during weekends or holidays at no additional cost to Owner, and the facility or building shall be clean and ready for Owner's use during Owner's hours of normal operation. Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitation, lavatories, toilets, entrances, and parking areas other than those designated by the Owner.
- 4.16.7 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner, which may be withheld in the sole discretion of the Owner.
- 4.16.8 The Contractor shall comply with all insurance requirements applicable to use and occupancy of the Project site or any buildings on the Project site.
- 4.17 CUTTING AND PATCHING OF WORK
- 4.17.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work or to make its several parts fit together properly and in accordance with the Contract Documents.
- 4.17.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any Separate Contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any Separate Contractor except with the written consent of the Owner and of such Separate Contractor. The Contractor shall not unreasonably withhold from the Owner or any Separate Contractor his consent to cutting or otherwise altering the Work. The Owner shall not be required to accept work with a cut, splice, or patch when such cut, splice or patch is not generally accepted practice for the particular work involved or is otherwise unworkmanlike in the opinion of the Design Consultant or the Owner.

4.17.3 Existing structures and facilities including but not limited to building, utilities, topography, streets, curbs, walks, etc., that are damaged or removed due to required excavations or other construction work, shall be patched, repaired or replaced by the Contractor to satisfaction of the Design Consultant and the Owner of such structures and facilities and authorities having jurisdiction. In event the local jurisdictional authorities require that such repairing and patching be done with their own labor and materials, the Contractor shall abide by such regulations and pay for such work with no increase in the Contract Sum.

4.18 CLEANING UP

4.18.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work and before final payment is made, he shall remove all his waste materials and rubbish from and about the Project as well as all his tools, construction equipment, machinery and surplus materials.

4.18.2 If the Contractor fails to clean up during or at the completion of the Work, the Owner may do so as provided in Section 6.3 and the cost thereof shall be charged to the Contractor.

4.19 COMMUNICATIONS

4.19.1 All communications from the Contractor relating to the Contract Documents or the construction schedule will be directed to the Design Consultant and copied to the Owner. Similarly, all correspondence from the Owner or Design Consultant will be directed to the Contractor and copied to the Owner or Design Consultant.

4.20 ROYALTIES AND PATENTS

4.20.1 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights arising out of the Work and shall save the Owner harmless from loss on account thereof. The Contractor shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Design Consultant. However, if the infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss, unless the information is promptly furnished to the Design Consultant.

4.21 INDEMNIFICATION

4.21.1 To the fullest extent permitted by law, the Contractor shall, at its sole cost and expense, indemnify, defend, and hold harmless the Owner and its agents, representatives, and employees from and against all claims, actions, judgments, costs, liabilities, penalties, damages, losses and expenses, including but not limited to attorneys' fees, arising out of and/or resulting from the performance of the Work, provided that any such claim, action, judgment, cost, liability, penalty, damage, loss or expense is caused by any negligent act, error or omission of the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be legally liable. The above obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Section 4.21.1. The parties agree that this indemnification clause is an "evidence of indebtedness" for purpose of N.C. Gen. Stat. § 6-21.2. The parties also specifically acknowledge that the Owner is a public body and it is the

intent of the parties that the Owner not incur any expenses when the Contractor is solely responsible for the claims.

4.21.2 In any and all claims against the Owner or the Design Consultant or any of their agents, representatives, or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Section 4.21 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

4.21.3 No provision of this Section 4.21 shall give rise to any duties on the part of the Design Consultant or the Owner, or any of their agents, representatives, or employees.

4.22 PERSONS AUTHORIZED TO SIGN DOCUMENTS

4.22.1 The Contractor, within five (5) days after the earlier of the date of a Notice to Proceed or the date of the Owner-Contractor Agreement, shall file with the Owner a list of all persons who are authorized to sign documents such as contracts, certificates, and affidavits on behalf of the Contractor and to fully bind the Contractor to all the conditions and provisions of such documents, except that in the case of a corporation he shall file with the Owner a certified copy of a resolution of the Board of Directors of the corporation in which are listed the names and titles of corporation personnel who are authorized to sign documents on behalf of the corporation and to fully bind the corporation to all the conditions and provisions of such documents.

4.23 CONDITIONS AFFECTING THE WORK

4.23.1 The Contractor shall be responsible for taking all steps necessary to ascertain the nature and location of the Work and the general and local conditions that can affect the Work or the cost thereof. Failure by the Contractor to fully acquaint himself with conditions which may affect the Work, including, but not limited to conditions relating to transportation, handling, storage of materials, availability of labor, water, roads, weather, topographic and subsurface conditions, Multi-Prime Contract conditions, applicable provisions of law, and the character and availability of equipment and facilities needed prior to and during the execution of the Work, shall not relieve the Contractor of his responsibilities under the Contract Documents and shall not constitute a basis for an adjustment in the Contract Sum or the Contract Time under any circumstances. The Owner assumes no responsibility for any understanding or representation about conditions affecting the Work made by any of his officers, employees, representatives, or agents prior to the execution of the Contract, unless such understandings or representations are expressly stated in the Contract Documents.

4.23.2 If in the execution of the Work any valuable items or materials of any kind are discovered buried or hidden within the Work, such items or materials shall be the property of the Owner. The Contractor shall take reasonable precautions to prevent any persons from removing or damaging such items or materials and shall immediately upon discovery thereof and before removal, acquaint the Owner or the Design Consultant with such discovery and carry out, at the expense of the Owner, the Owner's or the Design Consultant's orders as to disposal of the same.

4.24 COMPLIANCE WITH BOARD POLICIES AND PROCEEDURES

The Contractor acknowledges that Board policies are available for review at the Owner's website (<https://www.dpsnc.net>) and agrees to comply with the policies. If during the performance of the Work the Contractor finds compliance of any portion of Board policies to be impracticable, the Contractor shall immediately notify the Owner in writing setting forth the problems of such compliance and suggesting alternatives through which the same results intended by such portions of the Board policies can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives, or require compliance with the existing requirements of the Board policies. The Contractor also agrees to comply with the following provisions:

- 4.24.1 The Contractor, its Subcontractors and employees shall not possess or carry, whether openly or concealed, any gun, rifle, pistol, or explosive on any property owned by the Owner. This includes firearms locked in containers, vehicles or firearm racks within vehicles. The Contractor, its Subcontractors and employees shall not cause, encourage or aid a minor, who is less than 18 years old to possess or carry, whether openly or concealed, any weapons on any property owned by the Owner.
- 4.24.2 The Contractor, its Subcontractors and employees, are prohibited from profane, lewd, obscene or offensive conduct or language, including engaging in sexual harassment.
- 4.24.3 The Contractor and its Subcontractors shall not manufacture, transmit, conspire to transmit, possess, use or be under the influence of any alcoholic or other intoxicating beverage, narcotic drug, hallucinogenic drug, amphetamine, barbiturate, marijuana or anabolic steroids, or possess, use, transmit or conspire to transmit drug paraphernalia on any property owned by the Owner.
- 4.24.4 The Contractor and its Subcontractors may not at any time use or display tobacco or nicotine-containing products, including but not limited to electronic cigarettes (e-cigarettes), on the Owner's property, including indoor, outdoor and in a vehicle. The prohibition of the display of tobacco or nicotine products shall not extend to a display that has a legitimate instructional or pedagogical purpose. For purposes of this Contract, "tobacco product" is defined to include cigarettes, cigars, blunts, bidis, pipes, chewing tobacco, snuff, and any other items containing or reasonably resembling tobacco, tobacco products, or any facsimile thereof. "Tobacco use" includes smoking, chewing, dipping, or any other use of tobacco products.
- 4.24.5 The Contractor, its Subcontractors and employees shall not solicit from or sell to students or staff within the Owner's facilities or campuses, and shall not give gifts of any value to school system employees.
- 4.24.6 Operators of all commercial vehicles on any property owned by the Owner shall be subject to post-accident, random, reasonable suspicion and follow-up testing for drugs and alcohol.
- 4.24.7 The Contractor, its Subcontractors and employees are prohibited from using access to the site pursuant to this Agreement as a means to date, court, or enter into a romantic or sexual relationship with any student enrolled in the Owner's schools. The Contractor agrees to

indemnify the Owner for claims against the Owner resulting from relationships which have occurred or may occur between a student and an employee of the Contractor or Subcontractor.

4.24.8 Lunsford Act/Criminal Background Checks. The Contractor shall conduct at its own expense sexual offender registry checks on each of its owners, employees, agents, or Subcontractors (“contractual personnel”) who will engage in any service on or delivery of goods to school system property or at a school-system sponsored event, except checks shall not be required for individuals who are solely delivering or picking up equipment, materials, or supplies at: (1) the administrative office or loading dock of a school; (2) non-school sites; (3) schools closed for renovation; or (4) school construction sites.. The checks shall include at a minimum checks of the State Sex Offender and Public Protection Registration Program, the State Sexually Violent Predator Registration Program, and the National Sex Offender Registry (“the Registries”). For the Contractor’s convenience only, all of the required registry checks may be completed at no cost by accessing the United States Department of Justice Sex Offender Public Website at [http:// www.nsopw.gov/](http://www.nsopw.gov/). The Contractor shall provide certification that the registry checks were conducted on each of its contractual personnel providing services or delivering goods under this Agreement prior to the commencement of such services or the delivery of such goods. The Contractor shall conduct a current initial check of the registries (a check done more than 30 days prior to the date of this Agreement shall not satisfy this contractual obligation). In addition, Contractor agrees to conduct the registry checks and provide a supplemental certification before any additional contractual personnel are used to deliver goods or provide services pursuant to this Agreement. Contractor further agrees to conduct annual registry checks of all contractual personnel and provide annual certifications at each anniversary date of this Agreement. Contractor shall not assign any individual to deliver goods or provide services pursuant to this Agreement if said individual appears on any of the listed registries. Contractor agrees that it will maintain all records and documents necessary to demonstrate that it has conducted a thorough check of the registries as to each contractual personnel, and agrees to provide such records and documents to the school system upon request. Contractor specifically acknowledges that the school system retains the right to audit these records to ensure compliance with this Section at any time in the school system’s sole discretion. Failure to comply with the terms of this provision shall be grounds for immediate termination of the Agreement. In addition, the Owner may conduct additional criminal records checks at the Owner’s expense. If the school system exercises this right to conduct additional criminal records checks, Contractor agrees to provide within seven (7) days of request the full name, date of birth, state of residency for the past ten years, and any additional information requested by the school system for all contractual personnel who may deliver goods or perform services under this Agreement. Contractor further agrees that it has an ongoing obligation to provide the school system with the name of any new contractual personnel who may deliver goods or provide services under the Agreement. The Owner reserves the right to prohibit any contractual personnel of Contractor from delivering goods or providing services under this Agreement if the Owner determines, in its sole discretion, that such contractual personnel may pose a threat to the safety or well-being of students, school personnel or others.

4.24.9 Contractor shall not employ any individuals to provide services to the Owner who are not authorized by federal law to work in the United States. Contractor represents and warrants that it is aware of and in compliance with the Immigration Reform and Control Act and North Carolina law (Article 2 of Chapter 64 of the North Carolina General Statutes) requiring use of the E-Verify system for employers who employ twenty-five (25) or more employees and that it is and will remain in compliance with these laws at all times while providing services pursuant to this Agreement. Contractor shall also ensure that any of its Subcontractors (of any tier) will remain in compliance with these laws at all times while providing subcontracted

services in connection with this Agreement. Contractor is responsible for providing affordable health care coverage to all of its full-time employees providing services to the School System. The definitions of “affordable coverage” and “full-time employee” are governed by the Affordable Care Act and accompanying IRS and Treasury Department regulations.

- 4.24.10 The Contractor, its Subcontractors and employees shall not interact with any students. Nothing in Paragraph 4.24 shall be construed to prevent the Contractor, its Subcontractors and employees from taking necessary measures to protect students, staff or other employees.
- 4.24.11 The Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ any unfit person or anyone not skilled in the task assigned to it. The Owner may require the Contractor to remove any employee the Owner deems incompetent, careless or otherwise objectionable.
- 4.24.12 All agents and workers of the Contractor and its Subcontractors shall wear identification badges provided by the Contractor at all times they are on the Owner’s property. The identification badges shall at a minimum display the company name, telephone number, employee name and a picture of the employee.
- 4.24.13 The Contractor shall comply with the Owner’s site or school building access procedures when working on any existing school campus.
- 4.24.14 Anti-Nepotism. The Contractor warrants that, to the best of its knowledge and in the exercise of due diligence, none of its corporate officers, directors, or trustees and none of its employees who will directly provide services under this Agreement are immediate family members of any member of the Owner’s Board of Education or of any principal or central office staff administrator employed by the Owner. For purposes of this provision, “immediate family” means spouse, parent, child, brother, sister, grandparent, or grandchild, and includes step, half, and in-law relationships. Should Contractor become aware of any family relationship covered by this provision or should such a family relationship arise at any time during the term of this Agreement, Contractor shall immediately disclose the family relationship in writing to the Superintendent. Unless formally waived by the Owner, the existence of a family relationship covered by this Agreement is grounds for immediate termination by Owner without further financial liability to Contractor.
- 4.24.15 Restricted Companies Lists. Contractor represents that as of the date of this Agreement, Contractor is not included on the Final Divestment List created by the North Carolina State Treasurer pursuant to N.C. Gen. Stat. § 147-86.58. Contractor also represents that as of the date of this Agreement, Contractor is not included on the list of restricted companies determined to be engaged in a boycott of Israel created by the North Carolina State Treasurer pursuant to N.C. Gen. Stat. § 147-86.81.
- 4.24.16 The Contractor agrees not to discriminate against any employee, applicant for employment, or subcontractor because of physical or mental handicap. The Contractor also agrees not to discriminate against any employee, applicant for employment, or subcontractor because of race, color, religion, sex, gender identification or national origin.
- 4.24.17 Use of Drones. The Contractor acknowledges that it must obtain a signed written consent form from the Superintendent or designee to operate any and all aerial drones on the Owner’s property. Drones shall be operated in accordance with the Owner’s policy and all applicable

Federal Aviation Administration (FAA) regulations and North Carolina Department of Transportation (NCDOT) Division of Aviation requirements. Any request to operate a drone must be submitted to the Superintendent or designee in advance of the desired flight time and provide the following: the name(s) of the drone pilot and any individuals participating, proof of insurance coverage for the drone, proof of any required FAA permit, proof of any required NCDOT permit, and a detailed flight plan to include specific time and specific location.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITION

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the Work at the site. The term Subcontractor may be referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative. The term Subcontractor does not include any Separate Contractor or his subcontractors.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the Work at the site or who contracts to perform or supply any of the Work under the scope of a Subcontractor's subcontract. The term Sub-subcontractor may be referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.

5.1.3 Nothing contained in the Contract Documents is intended to, nor shall it create, any contractual relationship between the Owner, the Design Consultant, or any of their agents, consultants, employees, independent contractors, or representatives and any Subcontractor, Sub-subcontractor, Supplier or Vendor of the Contractor, except the relationship between Owner and Contractor, but the Owner shall be entitled to performance of all obligations intended for his benefit, and to enforcement thereof.

5.1.4 The Owner and Design Consultant will not deal directly with any Subcontractor, Sub-subcontractor or Material Supplier. Communication will be made only through the Contractor. Subcontractor, Sub-subcontractors or Material Suppliers shall route requests for information or clarification through the Contractor to the Design Consultant.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 The Contractor, in compliance with the requirements of the Contract Documents and within ten (10) days after the Notice to Proceed, shall furnish in writing to the Owner the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The Owner will promptly reply to the Contractor in writing stating whether or not the Owner, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner to reply within a reasonable time shall constitute notice of no reasonable objection. The Contractor understands and agrees that no contractual agreement exists for any part of the Work under this Contract between the Owner and any of the Contractor's Subcontractors or Sub-subcontractors. Further, the Contractor understands and agrees that he alone is responsible to the Owner for the Work under this Contract and that any review of Subcontractors or Sub-subcontractors by the Owner will not in any way make the Owner responsible to any

Subcontractor, nor responsible for the actions or failures of any Subcontractor or Sub-subcontractor.

- 5.2.1.1 The Contractor shall identify in the list of names of the Subcontractors proposed, those Subcontractors that are Historically Underutilized Businesses (HUB's) and indicate the portion of the Work that each Subcontractor will perform.
- 5.2.2 The Contractor shall not contract with any such proposed person or entity to whom the Owner has made reasonable objection under the provisions of Paragraph 5.2.1. The Contractor shall not be required to contract with anyone to whom he has a reasonable objection.
- 5.2.3 If the Owner has reasonable objection to any proposed person or entity under Paragraph 5.2.1, the Contractor shall name a substitute to whom the Owner has no reasonable objection. The Contract Sum shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate Change Order shall be issued, subject to an audit of said difference by the Owner; provided, however, that no increase in the Contract Sum shall be allowed for any such substitution unless the Contractor has acted promptly and responsively in submitting names as required by Paragraph 5.2.1 and the original proposed Subcontractor was: (i) able to carry out his work under his proposed subcontract, (ii) able to comply with all applicable laws, (iii) was an ongoing business in the field of his proposed subcontract, and (iv) had a labor force, capital and a means of supply compatible with the scope of his proposed subcontract.
- 5.2.4 If the Owner requires a change of any proposed Subcontractor or person or organization previously accepted by him on the Project, the Contract Sum shall be increased or decreased by the difference in cost occasioned by such change and an appropriate Change Order shall be issued, subject to an audit by Owner.
- 5.2.5 The Contractor shall notify the Owner and the Design Consultant of any substitution for any Subcontractor identified in accordance with Subparagraph 5.2.1.1. The Contractor shall make no substitution for any Subcontractor, person or entity previously selected if the Owner or the Design Consultant makes reasonable objection to such substitution. Also, Contractor may make no substitution of Subcontractors in violation of applicable law.
- 5.2.6 If during the duration of the Project, the Contractor effects a substitution for any Subcontractor per Paragraph 5.2.5, or if additional subcontract opportunities become available, the Contractor shall make a good faith effort to utilize Historically Underutilized Businesses (HUB's).

5.3 SUBCONTRACTUAL RELATIONS

- 5.3.1 By an appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Contract Documents, assumes toward the Owner. Said agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the agreement between the Contractor and Subcontractor, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract, copies of the Contract

Documents to which the Subcontractor will be bound by this Section 5.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Contract Documents available to his Sub-subcontractors.

5.3.2 The provisions herein regarding Subcontractor approvals shall in no way affect the liability of the Contractor to the Owner regarding performance of all obligations by or payment of Subcontractors. Approval to subcontract with any given Subcontractor shall not to any degree relieve the Contractor of his obligation to perform or have performed to the full satisfaction of the Owner the Work required by this Contract.

5.3.3 The Contractor shall submit Notice to the Owner of any Claims by Subcontractors for which the Owner is believed to be responsible, in strict conformance with the same time requirements and other procedures established for the submission of the Contractor's Claims to the Owner.

5.4 QUALIFICATION SUBMITTALS

5.4.1 Specific qualification submittals may be required of Subcontractors, installers and suppliers for certain critical items of the Work. Required qualification submittals are set forth in detail in the Specifications and shall be collected and submitted by the Contractor for review and approval by the Design Consultant. All information required of a single Subcontractor, installer or supplier shall be contained in a single, complete submittal. The Contractor shall submit the required qualification information within ten (10) days after receipt of the Design Consultant's request.

5.4.2 The Owner and Design Consultant shall reject any proposed Subcontractor, installer or supplier, or any qualification submittals related thereto, for the following reasons:

(i) The Contractor's failure to submit requested information within the specified time; or

(ii) The Contractor's failure to provide all of the requested information; or

(iii) The Contractor's submission of a Subcontractor, installer or supplier, or qualifications thereof, which are unacceptable in the judgment of the Owner or Design Consultant.

5.4.3 Should the Owner or Design Consultant have reasonable objection to any proposed Subcontractor, installer or supplier, the Contractor shall submit another person or firm who are reasonably acceptable to the Owner and Design Consultant.

5.5 PREPARATORY WORK

5.5.1 Before starting a portion of the Work, the Contractor and the responsible Subcontractor shall carefully examine all preparatory work that has been executed to receive his work. The Subcontractor shall check carefully, by whatever means are required, to ensure that his work and adjacent related work will finish to proper contours, planes and levels. He shall promptly notify the Contractor and the Design Consultant of any defects or imperfections in preparatory work, which will, in any way, affect satisfactory completion of his work. Absence of such notification will be construed as an acceptance of preparatory work and later Claims of defects therein will not be recognized.

5.5.2 Under no conditions shall a portion of the Work proceed prior to preparatory work having been completed, cured, dried, and otherwise made satisfactory to receive such related work.

Responsibility for timely installation of all materials rests solely with the Contractor, who shall maintain coordination control at all times.

ARTICLE 6

WORK BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to perform work related to the Project with his own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar conditions of the Contract.

6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford Separate Contractors and the Owner reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the Work with that of the Owner and other contractors to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the Work as will not unduly or unreasonably interfere with the progress of the Work or the work of any other contractors.

6.2.1.1 If the execution or result of any part of the Work depends upon any work of the Owner or of any Separate Contractor, the Contractor shall, prior to proceeding with the Work, inspect and promptly report to the Owner in writing any apparent discrepancies or defects in such work of the Owner or of any Separate Contractor that render it unsuitable for such proper execution or result of any part of the Work.

6.2.1.2 Failure of the Contractor to so inspect and report shall constitute an acceptance of the Owner's or Separate Contractor's work as fit and proper to receive the Work, except as to defects which may develop in the Owner's or Separate Contractor's work after completion of the Work and which the Contractor could not have discovered by its inspection prior to completion of the Work.

6.2.2 Should the Contractor cause damage to the Work or property of the Owner or of any Separate Contractor on the Project, or to other work on the site, or delay or interfere with the Owner's work on ongoing operations or facilities or adjacent facilities or said Separate Contractor's work, the Contractor shall be liable for the same; and, in the case of another contractor, the Contractor shall attempt to settle said Claim with such other contractor prior to such other contractor's institution of litigation or other proceedings against the other contractor.

6.2.2.1 Should a Separate Contractor be declared in default by the Owner, the Owner shall not be obligated to hire a contractor to perform the work of the Separate Contractor during the time the Separate Contractor's surety is remedying the default pursuant to Paragraph 3.4.2.

6.2.2.2 If such Separate Contractor sues the Owner or Design Consultant on account of any damage, delay or interference cause or alleged to have been caused by the Contractor, the Owner shall

notify the Contractor, who shall defend the Owner and Design Consultant in such proceedings at the Contractor's expense. If any judgment or award is entered against the Owner or Design Consultant in such proceedings, the Contractor shall satisfy the same and shall reimburse the Owner and Design Consultant for all damages, expenses, attorney's fees and other costs which the Owner or Design Consultant incurs as a result thereof.

6.2.3 Should a Separate Contractor cause damage to the Work or to the property of the Contractor or cause delay or interference with the Contractor's performance of the Work, the Contractor shall present directly to said Separate Contractor any Claims it may have as a result of such damage, delay or interference (with an information copied to the Owner) and shall attempt to settle its Claim against said Separate Contractor prior to the institution of litigation or other proceedings against said Separate Contractor.

6.2.3.1 In no event shall the Contractor seek to recover from the Owner or the Design Consultant, and the Contractor hereby waives any Claims against the Owner and Design Consultant relating to any costs, expenses (including, but not limited to, attorney's fees) or damages or other losses incurred by the Contractor as a result of any damage to the Work or property of the Contractor or any delay or interference caused by any Separate Contractor.

6.2.4 Whenever Contractor receives items from another contractor or from Owner for storage, erection or installation, the Contractor receiving such items shall give receipt for items delivered, and thereafter will be held responsible for care, storage and any necessary replacing of item or items received.

6.2.5 When certain items of equipment and other work are indicated as "NIC" (not in contract), or to be furnished and installed under other contracts, any requirements set forth in the Contract Documents for preparation of openings, provision of backing, etc., for receipt of such "NIC" work will be furnished upon written request of the Contractor who shall properly form and otherwise prepare his work in a satisfactory manner to receive such "NIC" work.

6.3 OWNER'S RIGHT TO PERFORM DISPUTED WORK

6.3.1 If a dispute arises between the Contractor and Separate Contractors as to their responsibility for cleaning up as required by Section 4.18 or for accomplishing coordination or doing required cutting, filling, excavating or patching as required by Section 4.17, the Owner may carry out such work and charge the cost thereof to the responsible party as the Owner shall determine to be just.

6.4 COORDINATION OF THE WORK

6.4.1 By entering into this Contract, Contractor acknowledges that there may be other contractors on the site whose work will be coordinated with that of his own. Contractor expresses, warrants and guarantees that he will cooperate with other contractors and will do nothing to delay, hinder or interfere with the work of other Separate Contractors, the Owner or Design Consultant. Contractor also expressly agrees that, in the event his work is hindered, delayed, interfered with or otherwise affected by a Separate Contractor, his sole remedy will be a direct action against the Separate Contractor as described in this Article 6. Contractor will have no remedy, and hereby expressly waives any remedy, against the Owner and/or the Design Consultant on account of delay, hindrance, interference or other event caused by a Separate Contractor.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 This Contract shall be governed by the laws of the State of North Carolina. The Contractor and Owner agree that Durham County, North Carolina shall be the proper venue for any litigation arising out of this Contract.

7.1.2 Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein. If through mistake or otherwise, any such provision is not inserted or is not correctly or fully inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The Owner and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any moneys due or to become due to him hereunder, without the previous written consent of the Owner and the Contractor's Surety.

7.3 CLAIMS AND DAMAGES

7.3.1 Should the Contractor, Subcontractor or any Sub-subcontractor suffer injury or damage to person or property because of any act or omission of the Owner or Design Consultant, or of any of their employees, agents or others for whose acts either is legally liable, the Claim on behalf of the Contractor its Subcontractors or Sub-subcontractors shall be made by giving Notice to the Owner, as provided in Article 15 ; otherwise, the Contractor, Subcontractors and Sub-subcontractors shall have waived any and all rights he may have against the Owner or the Design Consultant, or their employees, representatives and agents. The Contractor shall indemnify, defend and hold the Owner harmless from any Claim by a Subcontractor that is waived because it is not filed in strict conformance with this Paragraph or any other provision of the Contract regarding Claims.

7.4 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.4.1 The Contractor shall furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in a form and with a Surety satisfactory to the Owner.

7.4.2 The Contractor is required to furnish in duplicate a Performance Bond and a Labor and Material Payment Bond, each in the amount of one hundred percent (100%) of the Contract Sum, written by a surety company licensed to do business in North Carolina and with a minimum AM Best "A" rating or comparable rating from another service reasonably acceptable to Owner.

7.5 RIGHTS AND REMEDIES

- 7.5.1 The duties and obligations of the Contractor imposed by the Contract Documents and the rights and remedies of the Owner available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.
- 7.5.2 Except as may be specifically agreed in writing, the failure of the Owner or the Design Consultant to insist in any one or more instances upon the strict performance of any one or more of the provisions of the Contract, or to exercise any right herein contained or provided by law, shall not be construed as a waiver or relinquishment of the performance of such provisions or right(s) or of the right to subsequently demand such strict performance or exercise such right(s), and the rights shall continue unchanged and remain in full force and effect.
- 7.5.3 The Contractor agrees that he can be adequately compensated by money damages for any breach of the Contract which may be committed by the Owner and hereby agrees that no default, act, or omission of the Owner or the Design Consultant, except for failure to make progress payments as required by the Contract Documents, shall constitute a material breach of the Contract entitling the Contractor to cancel or rescind the provisions of the Contract or (unless the Owner shall so consent or direct in writing) to suspend or abandon performance of all or any part of the Work. The Contractor hereby waives any and all rights and remedies to which he might otherwise be or become entitled, save only his right to money damages.

7.6 TESTS AND INSPECTIONS

- 7.6.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested, or approved, the Contractor shall give the Owner and Design Consultant timely Notice of its readiness so the Design Consultant and the Owner may observe such inspection, testing or approval. Unless otherwise specifically provided in the Contract Documents, the Contractor shall bear all costs of such inspections, tests or approvals, except that Owner shall pay for “special inspections” as defined and required in Section 1704, the North Carolina State Building Code, or successor section. In the event that such “special inspections” reveal a failure of the Work to comply with the Contract Documents or applicable laws, ordinances, regulations or orders of public authorities having jurisdiction, Contractor shall reimburse the Owner for the costs of such “special inspections”.
- 7.6.1.1 Unless otherwise stipulated in the Contract Documents, the Contractor shall pay for all utilities required for testing of installed equipment of all of his work and work of each Subcontractor. Boiler fuel other than gas shall be provided by Subcontractor furnishing boilers. Labor and supervision required for making such tests shall be provided at no additional cost to the Owner.
- 7.6.2 If the Design Consultant or the Owner determines that any portion of the Work requires additional inspection, testing, or approval which Paragraph 7.6.1 does not include, the Owner will instruct the Contractor to order such additional inspection, testing or approval, and the Contractor shall give Notice as provided in Paragraph 7.6.1. If such additional inspection or testing reveals a failure of any portion of the Work to comply (1) with the requirements of the Contract Documents, or (2) with respect to the performance of the Work, with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, the Contractor shall bear all costs thereof, including compensation for the Design Consultant's and Owner's additional construction management expenses made necessary by such failure.
- 7.6.3 With regard to inspections and tests, the costs of which the Owner is responsible for paying, they will be made by a pre-qualified, independent testing agency selected by the Owner. The cost of the initial services of such agency will be paid by the Owner. When the initial tests

indicate non-compliance with the Contract Documents, any subsequent testing occasioned by non-compliance shall be performed by the same agency and the cost thereof shall be borne by the Contractor. Representatives of the testing agency shall have access to the Work at all times. The Contractor shall provide facilities for such access in order that the agency may properly perform its functions.

7.6.4 The independent testing agency, contracted by the Owner, shall prepare the test reports, logs, and certificates applicable to the specific inspections and tests and promptly deliver the specified number of copies to the designated parties. Certificates of inspection, testing or approval required by public authorities shall be secured by the Contractor and promptly delivered by him to the Owner, in adequate time to avoid delays in the Work or final payment therefore.

7.6.5 If the Design Consultant or the Owner is to observe the inspections, tests or approvals required by the Contract Documents, laws, ordinances, rules, regulations, or order of any public authority having jurisdiction or that are required to establish compliance with the Contract Documents, he will do so promptly and, where practicable, at the normal place of testing.

7.6.6 The Contractor shall pay for and have sole responsibility for inspections or testing performed exclusively for his own convenience.

7.7 UNENFORCEABILITY OF ANY PROVISION

7.7.1 If any provision of this Contract is held as a matter of law to be unenforceable or unconscionable, the remainder of the Contract shall be enforceable without such provision.

7.8 ATTORNEYS' FEES AND OTHER EXPENSES

7.8.1 The Contractor hereby agrees that he will not submit, assert, litigate or otherwise pursue any frivolous or unsubstantiated Claims or Claims he has specifically waived under the terms of the Contract Documents. In the event that the Contractor's or its Subcontractor's or Sub-subcontractor's Claims, or any separate item of a Claim, is without substantial justification, the Contractor shall reimburse the Owner or Design Consultant for all costs and expenses associated with defending such Claim or separate item, including but not limited to, attorneys' fees, audit costs, accountants' fees, expert witness' fees, additional Design Consultant expenses, additional construction management expenses, or services and any other consultant costs.

7.8.2 If the Contractor breaches any obligation under the Contract Documents, the Contractor shall reimburse the Owner and Design Consultant for all costs and expenses incurred by the Owner relating to such breach, including but not limited to attorneys' fees, audit costs, accountants' fees, expert witness' fees, additional Design Consultant expenses, additional construction management expenses, and any other consultant costs.

7.8.3 If the Owner or Design Consultant substantially prevails in a Claim brought against the Contractor, or in defending a Claim brought by the Contractor, including but not limited to, Claims for fraud or misrepresentation, overpayment, defective work, delay damages, and recovery of termination expenses, the Contractor shall reimburse the Owner and/or Design Consultant for all costs and expenses incurred by them relating to such Claim, including but not limited to attorneys' fees, audit costs, accountants' fees, expert witness' fees, additional Design Consultant expenses, additional construction management expenses, and any other consultant costs.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Final Completion of the Work as defined in Paragraph 8.1.4, including authorized adjustments thereto. The Contractor shall achieve Final Completion within the Contract Time.

8.1.2 The date of commencement of the Work is the date established in the Notice to Proceed. If there is no Notice to Proceed, it shall be the date of the Owner-Contractor Agreement or such other date as may be established therein. The Contractor shall not commence work or store materials or equipment on site until written Notice to Proceed is issued or until the Contractor otherwise receives the Owner's written consent.

8.1.3 The date of Substantial Completion of the Work or designated portion thereof is the date certified by the Design Consultant and the Owner when the Work or a designated portion thereof is sufficiently complete, in accordance with the Contract Documents, so the Owner can fully and legally occupy and utilize the Work or designated portion thereof for the use for which it is intended, with all of the parts and systems operable as required by the Contract Documents, including a preliminary test and balance report for the mechanical system. Only incidental corrective work and any final cleaning beyond that needed for the Owner's full use may remain for Final Completion. The Contractor acknowledges and agrees that the intercom, telephone, data security, building automation system (including functional graphics at the site), MATV, and other educational operational systems are required for the Owner's use of the building for its intended purpose. The Contractor shall provide operation and maintenance manuals to the Owner as required by the Contract Documents prior to Substantial Completion and shall provide the required training on the operation of the equipment and systems within two weeks of Substantial Completion. The Contractor shall achieve Substantial Completion by the date specified in the Supplemental Conditions including authorized adjustments thereto. The Owner's occupancy of incomplete work shall not alter the Contractor's responsibilities pursuant to this paragraph. Only incidental corrective work and any final cleaning beyond that needed for the Owner's full use may remain for Final Completion. The issuance of a temporary or final certificate of occupancy shall not, in itself, constitute Substantial Completion.

8.1.4 Final Completion of the Work occurs on the date certified by the Design Consultant and the Owner when the Work is totally complete, to include punch list work, in accordance with the Contract Documents and the Owner may fully occupy and utilize the Work for the use for which it is intended. The issuance of a temporary or final certificate of occupancy shall not, in itself, constitute Final Completion.

8.1.5 The term Day as used in the Contract Documents shall mean calendar day unless otherwise specifically designated. All dates shall mean midnight of the indicated day unless otherwise stipulated.

8.1.6 Completion Dates shall mean the dates set forth in the Supplemental Conditions for Substantial Completion and Final Completion.

8.2 PROGRESS AND COMPLETION

- 8.2.1 All time limits stated in the Contract Documents are of the essence of the Contract with respect to the Contractor's performance.
- 8.2.2 The Contractor shall begin the Work on the date of commencement as defined in Paragraph 8.1.2. He shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion and Final Completion within the time frames stated in the Contract Documents.
- 8.2.3 Attention is directed to the fact that the Work is urgently needed by the Owner; for this reason, it shall be agreed that the Contractor and its Subcontractors will achieve Substantial Completion of the Work under the Contract within the time established under Paragraph 8.2.4 of the Supplemental Conditions after award of Contract, or Notice to Proceed, and that he will achieve Final Completion of the Work in all its details for final acceptance within the time established under Paragraph 8.2.4 of the Supplemental Conditions.
- 8.2.4 The Owner reserves the right to withhold the issuance of Notice to Proceed by up to forty-five (45) days. For each day that Notice to Proceed is withheld pursuant to this Subparagraph, the dates established for Substantial Completion and Final Completion shall be adjusted. The contractor shall not be entitled to additional compensation if the owner withholds the issuance of Notice to Proceed pursuant to this Subparagraph.

8.3 DELAYS AND EXTENSIONS OF TIME

- 8.3.1 The time during which the Contractor or any of the Subcontractors is delayed in the performance of the Work by the issuance of any required permits, acts of god, excessive inclement weather, fires, floods, epidemics, quarantine restrictions, strikes, riots, civil commotions or freight embargoes, or other conditions beyond the Contractor's or the Subcontractors' control and which the Contractor or the Subcontractors could not reasonably have foreseen and provided against, except for delays caused solely by the Owner, Design Consultant or their consultants, shall be added to the time for completion of the Work stated in the Contract. Neither the Owner nor the Design Consultant shall be obligated or liable to the Contractor or the Subcontractors for indirect or direct damages, costs or expenses of any nature which the Contractor, the Subcontractors, or any other person may incur as a result of any of the delays, interferences, changes in sequence in the Work included in this Section 8.3.1. The Contractor hereby expressly waives any Claims against the Owner and the Design Consultant on account of any indirect or direct damages, lost profits, costs or expenses of any nature which the Contractor, the Subcontractors or any other person may incur as a result of any delays, interferences, changes in sequence or the like, and it is understood and agreed that the Contractor's sole and exclusive remedy in any such events shall be an extension of the Contract time in accordance with the Contract Documents.
- 8.3.2 In the event Project delays arise from or out of any act or omission of the Owner, Design Consultant or their consultants, the time during which the Project is delayed shall be added to the Contract and the Contractor may be reimbursed for its direct Project damages, excluding general overhead expenses and indirect costs, if the Contractor strictly complies with this Article 8.3. Notwithstanding the previous sentence, if the Contractor or Subcontractor in any way shares in responsibility for the delay, neither the Owner nor the Design Consultant shall be obligated or liable to the Contractor or the Subcontractors for indirect or direct damages, costs or expenses of any nature which the Contractor, the Subcontractors, or any other person may incur as a result of any of the delays, interferences, changes in sequence of the Work, and the Contractor's sole remedy, if any, shall be an extension of the Contract time.

- 8.3.3 In the event Project delays arise solely from or out of any act or omission of the Contractor, Subcontractors or their agents, the Contractor shall not be entitled to extension of the Contract time and shall be subject to the payment of Liquidated Damages as provided in this Contract.
- 8.3.4 The Contract time shall be adjusted only for changes pursuant to section 12.1, suspension of the Work pursuant to paragraph 3.3.2 or paragraph 3.3.3, and excusable delays pursuant to paragraph 8.3.4. In the event the Contractor requests an extension of the Contract time or files a Claim related to any form of delay, it shall furnish such justification and supporting evidence as the Owner may deem necessary for a determination of whether or not the Contractor is entitled to an extension of time under the provisions of the Contract, and shall further conform to all of the requirements of the specifications and the Contract regarding construction schedules and reports. The burden of proof to substantiate a Claim shall rest with the Contractor, including evidence that the cause was beyond its control. The Owner shall base its findings of fact and decision on such justification and supporting evidence, including a finding that the alleged delay impacted the Project's critical path, and shall advise the Contractor in writing thereof. If the Owner finds that the Contractor is entitled to any extension of the Contract time, the Owner's determination of the total number of days of extension shall be based upon the currently approved progress schedule and on all data relevant to the extension. Such data will be incorporated into the schedule in the form of a revision thereto, accomplished in a timely manner. The Contractor acknowledges and agrees that actual delays (due to said changes, suspension of Work or excusable delays) in activities which, according to the schedule, do not affect the Contract time, do not have any effect upon the Contract time and therefore will not be the basis for a change therein. The Contractor acknowledges and agrees that time extensions will be granted only to the extent that excusable delays exceed the available float in the critical path activities in the Contractor's currently approved schedule.
- 8.3.4.1 Extensions in the Contract time by Change Orders are subject to extension-in-time audit by the Owner as follows:
- 8.3.4.1.1 The Contractor agrees that, even though the Owner, Contractor and Design Consultant have previously signed a Change Order containing an extension-in-time resulting from a change in or addition to the Work that said extension in the Contract time may be adjusted by an audit after the fact by the Owner. If such an audit is to be made, the Owner must undertake the audit and make a ruling within thirty (30) days after the completion of the Work under the Change Order.
- 8.3.4.1.2 The Contractor agrees that any extension of the Contract time to which it is entitled arising out of a Change Order undertaken on a force accounting (labor and materials) basis, shall be determined by an extension-in-time audit by the Owner after the Work of the Change Order is completed. Such rulings shall be made by the Owner within thirty (30) days after a request for same is made by the Contractor or Design Consultant, except said thirty (30) days will not start until the Work under the Change Order is completed.
- 8.3.4.1.3 Should a time extension be granted for Substantial Completion the date for Final Completion shall be appropriately adjusted unless specifically stated otherwise.
- 8.3.4.2 Subject to other provisions of the Contract, the Contractor may be entitled to an extension of the Contract time (but no increase in the Contract sum) for delays arising from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, the Subcontractors or suppliers as follows:

- 8.3.4.2.1 Labor disputes and strikes (including strikes affecting transportation), that do, in fact, directly delay the progress of the Work on the critical path; however, an extension of Contract time on account of an individual labor strike shall not exceed the number of days of said strike;
- 8.3.4.2.2 Acts of nature: tornado, fire, hurricane, blizzard, earthquake, or flood that damage Work in place or stored materials or adversely impact the schedule's critical path;
- 8.3.4.2.3 Excessive inclement weather; however, the Contract time will not be extended due to reasonably anticipated inclement weather or for delays in the aftermath of inclement weather, reasonably anticipated or excessive. The time for performance of this Contract, as stated in the Contract Documents, includes an allowance for calendar days which may not be available for construction out-of-doors; for the purposes of this Contract, the Contractor agrees that the number of calendar days per month based on a five-year average shall be considered reasonably anticipated inclement weather and planned for in the construction schedule per the Contract. Unless the Contractor can substantiate to the satisfaction of the Owner that there was greater than the reasonably anticipated inclement weather considering the time from the notice-to-proceed until the building is enclosed using data from the national weather service station identified in the Supplemental Conditions, or a weather station acceptable to the Owner and that such alleged greater than reasonably anticipated inclement weather actually delayed the Work or portions thereof which had an effect upon the Contract time, the Contractor shall not be entitled to an extension of time. The Parties agree that the weather station applicable to this Project shall be the one located at Raleigh-Durham Airport, unless a different weather station is specifically agreed to in writing between the Owner and Contractor.

Also the Contractor agrees that the calculation of the number of excessive inclement weather days shall be the number of days in excess of the five-year average for each month, in which precipitation exceeded one tenth (.10) inch, or in which the highest temperature was 32 degrees F or less as recorded at the approved weather station. Rain days from hurricanes and tropical storms not causing damage in the county in which the project is located shall be deemed inclement weather days.

If the total accumulated number of calendar days lost to excessive inclement weather, from the notice-to-proceed until the building is enclosed, exceeds the total accumulated number to be reasonably anticipated for the same period from the table above, time for completion will be extended by the number of calendar days needed to include the excess number of calendar days lost. No extension of time will be made for days due to excessive inclement weather occurring after the building is enclosed. For the purpose of this Contract, the term "enclosed" is defined to mean when the building is sufficiently roofed and sealed, either temporarily or permanently, to permit the structure to be heated and the plastering and dry-wall trades to work. The Design Consultant shall determine when the structure is "enclosed". Upon the request of either party, the Design Consultant shall issue a letter certifying to the Owner, with a copy to the Contractor, stating the date the building became enclosed. No change in Contract sum will be authorized because of adjustment of Contract time due to excessive inclement weather; and

- 8.3.4.2.4 Delays in the issuance of a permit required for construction of the Project, acts of the public enemy, acts of the State, Federal or local government in its sovereign capacity, and acts of another Contractor in the performance of a Contract with the Owner relating to the Project.
- 8.3.5 If the Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay the Owner the amount specified in the Contract, not as a penalty but as Liquidated Damages for such breach of Contract

as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the Work. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

8.3.6 The Contractor and the Subcontractors shall not be entitled to and hereby expressly waive any extension of time resulting from any condition or cause unless said Claim for extensions of time is made in writing to the Owner within ten (10) days of the first instance of delay for all delays, except excessive inclement weather which shall be made in writing to the Owner within forty-five (45) days after the date the structure is enclosed. Circumstances and activities leading to such Claim shall be indicated or referenced in a daily field inspection report for the day(s) affected. In every such written Claim, the Contractor shall provide the following information:

8.3.6.1 Nature of the delay;

8.3.6.2 Date (or anticipated date) of commencement of delay;

8.3.6.3 Activities on the progress schedule affected by the delay, and/or new activities created by the delay and their relationship with existing activities;

8.3.6.4 Identification of person(s) or organization(s) or event(s) responsible for the delay;

8.3.6.5 Anticipated extent of the delay; and

8.3.6.6 Recommended action to avoid or minimize the delay.

8.3.7 If no schedule or agreement is made stating the dates upon which written interpretations as set forth in Section 2.2 shall be furnished, then no Claim for delay shall be allowed on account of failure to furnish such interpretations until twenty (20) days after request is made for them, and not then unless such Claim is reasonable.

8.3.8 No Claim by the Contractor for an extension of time for delays will be considered unless made in strict compliance with the requirements of this Article. All Claims not filed in accordance with this paragraph shall be waived by the Contractor.

8.4 RESPONSIBILITY FOR COMPLETION

8.4.1 The Contractor shall be responsible for completion in accordance with Paragraph 4.12.1.

8.4.2 The Owner may require the Contractor to submit a recovery schedule demonstrating his program and proposed plan to make up the lag in scheduled progress and to ensure completion of the Work within the Contract Time if the Project is behind schedule by four (4) or more days. If the Owner finds the proposed plan not acceptable, he may require the Contractor to submit a new plan. If the actions taken by the Contractor or the second plan proposed are not satisfactory, the Owner may require the Contractor to take any of the actions set forth in Paragraph 4.12.2 without additional cost to the Owner, to make up the lag in scheduled progress.

8.4.3 Failure of the Contractor to substantially comply with the requirements of this Section 8.4 may be considered grounds for a determination by the Owner, pursuant to Section 14.3, that the

Contractor is failing to prosecute the Work with sufficient diligence to ensure its completion within the Contract Time.

8.5 LIQUIDATED DAMAGES FOR DELAY

8.5.1 Owner and Contractor agree that the damages incurred by the Owner due to the Contractor's failure to achieve Substantial Completion by the date specified in the Contract Documents for Substantial Completion, including any extensions thereof, shall be in the amount of seven hundred fiftydollars (\$750) per calendar day, for each consecutive day beyond the date of Substantial Completion that Contractor achieves Substantial Completion, and that the damages incurred by the Owner due to the Contractor's failure to achieve Final Completion by the date specified in the Contract Documents for Final Completion, including any extensions thereof, shall be in the amount of two hundred and fifty dollars (\$250) per calendar day for each consecutive day beyond the date of Final Completion that Contractor achieves Final Completion. The Liquidated Damages are a reasonable estimate by Contractor and Owner of the damages to be suffered by Owner and are not to be construed as a penalty, it being recognized by the Owner and the Contractor that the injury to the Owner which could result from a failure of the Contractor to complete on schedule is uncertain and cannot be computed exactly or that it would be unreasonably expensive for Owner to calculate its damages exactly.

8.5.2 The amount specified above for Substantial Completion is the minimum measure of damages the Owner will sustain due to delay in the completion of the Work, which shall include, but not be limited to the loss of use of the facilities, the relocation of students and services, the cost of the Owner's time and resources, damage to the Owner's reputation, and storage of furniture and other materials. The amount specified above for Final Completion is a reasonable and proper measure of the damages the Owner will sustain due to the delay in the completion of remedial work. This amount includes the disruption to the school and the learning environment, the cost of the Owners time and resources, damage to the Owner's reputation, and the inability to fully use the facilities. The inability of the Owner to quantify actual damages shall not prevent the recovery of Liquidated Damages.

8.5.3 Notwithstanding any other provisions of these General Conditions, if there is concurrent delay in the completion of the Work, the Contractor shall be liable for Liquidated Damages as specified above during such period of concurrent delay. For the purpose of this Paragraph, concurrent delay means (a) a delay event caused in part by the Owner or its agent and in part by the Contractor or its agents, Subcontractors or Sub-subcontractors, or (b) one or more delay event caused solely by the Owner, its agents, or the Design Consultant, and one or more delay event caused in part by the Contractor, its agents, Subcontractors or Sub-subcontractors, each of which would have resulted in a delay without the other and which delays run concurrently, or at the same time. In the event that the foregoing provision making the Contractor liable for Liquidated Damages during a period of concurrent delay is found to be unenforceable, then the parties agree that in the event of a concurrent delay, the extent of the delay will be apportioned between the Owner and the Contractor, and the Contractor will be responsible for Liquidated Damages as set forth in the General Conditions and Supplemental Conditions for those portions of the delay which are apportioned to the Contractor, its agent, Subcontractors, Sub-subcontractors, or Material Suppliers.

8.5.4 The provisions for Liquidated Damages do not bar or limit Owner's other rights and remedies against Contractor, for damages other than for failure to achieve the Substantial Completion date or the Final Completion date as required. The amount of Liquidated Damages set forth in Section 8.5 shall not include additional legal or design professional costs that may result from the Contractor's default. If such legal or design professional costs are incurred by the Owner,

the Contractor shall be liable to the Owner for those costs in addition to the Liquidated Damages amount set forth in Section 8.5.

- 8.5.5 The Liquidated Damages assessed for failure to meet Substantial Completion by the specified date and the Liquidated Damages assessed for failure to meet Final Completion by the specified date shall be assessed cumulatively.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

- 9.1.1 The Contract Sum is stated in the Owner-Contractor Agreement and, including authorized adjustments thereto, is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

- 9.2.1 Before the first Application for Payment, the Contractor shall submit to the Owner a schedule of values allocated to the various portions of the Work and supported by such data to substantiate its accuracy as the Owner may require. This schedule, unless objected to by the Owner, shall be used as a basis for the Contractor's Applications for Payment and only for this purpose. If approved by the Owner, the Contractor may include in his schedule of values a line item for mobilization which shall include a reasonable amount of mobilization for the Contractor and his Subcontractors. The Contractor shall not front-end load his schedule of values. The Design Consultant shall approve the schedule of values prior to the Contractor submitting an Application for Payment for any Work, except reimbursement for the cost of the Contractor's bonds and insurance.

9.3 APPLICATIONS FOR PAYMENT

- 9.3.1 At least 30 days prior to the date for each progress payment established in the Owner-Contractor Agreement, the Contractor shall submit to the Design Consultant an itemized Application for Payment, notarized if required, supported by such data substantiating the Contractor's right to payment as the Design Consultant and the Owner may require, including but not limited to the Contractor's certification that all work for which payment is requested has been completed in full in accordance with the Contract Documents, and reflecting retainage, if any, as provided elsewhere in the Contract Documents. If requested by the Owner, the Contractor shall also certify that he has paid all due and payable amounts for which previous Applications for Payment were issued and payments received from the Owner, by providing waivers of liens for said payments. At least 40 days prior to the date established for payment, the Contractor may submit a draft of the itemized Application for Payment for review and comment by the Design Consultant prior to the Contractor submitting the actual itemized Application for Payment. Unless otherwise stated in the Contract Documents or agreed to in writing between the Owner and Contractor, Applications for Payment shall be due on the 25th day of each month.

- 9.3.1.1 The Contractor shall submit with the Application for Payment a list of those Historically Underutilized Businesses (HUB's) Subcontractors whose work is included in the application and the amount due each. In addition, the Historically Underutilized Business (HUB) must itself perform satisfactory work or services or provide supplies under the Contract and not act as a mere conduit.

- 9.3.2 The Owner will withhold retainage from Contractor on all Applications for Payment to the maximum extent and in the maximum amount allowed by law (currently codified at N.C.G.S. 143-134.1) and in accordance with that statute or applicable successor statute. In the event that N.C.G.S 143-134.1 or applicable successor statute are not in effect or do not apply at the time the Contract is executed, Owner will retain five percent (5%) of the amount of each Application for Payment from the Contractor as retainage, until Contractor achieves Final Completion, whether or not the Owner has occupied any or all of the Project before such time. However, if the Owner, at any time after fifty percent (50%) of the Work has been completed, finds that satisfactory progress is being made, he may authorize payment to the Contractor in full of each Progress Payment for work performed beyond the fifty percent (50%) stage of completion. If a reduction in retainage has been made, the Owner may increase the retainage back to original percentage at any time if the Owner concludes that the Contractor is not progressing with the Work in a timely or satisfactory manner.
- 9.3.3 Payments may be made by the Owner, at its sole discretion, on account of materials or equipment not incorporated in the work but delivered and suitably stored at the site or in a bonded warehouse by the Contractor. Payments for materials or equipment stored shall only be considered upon submission by the Contractor of satisfactory evidence (for example, releases or paid invoices from the seller) that the Contractor has acquired title to such material, that it will be utilized on the work under this Contract and that it is satisfactorily stored, protected, and insured or that other procedures satisfactory to the Owner that will protect the Owner's interests have been taken. In the event the materials are stored in a bonded warehouse that is not located in the county of the project, the Contractor shall reimburse the travel cost and hourly billing expenses incurred by the Design Consultant for travel to view and assess whether the materials meet the requirements of the Contract Documents. Materials once paid for by the Owner become the property of the Owner and may not be removed from the work site or bonded warehouse, other than to be delivered from the warehouse to the site, without the Owner's written permission. Responsibility for such stored materials and equipment shall remain with the Contractor regardless of ownership.
- 9.3.3.1 Owner will not make payment to the Contractor on account of materials or equipment not incorporated in the Work but delivered and stored at the site if the Contractor, in his schedule of values, does not include line items for such delivered and stored materials or equipment.
- 9.3.3.2 It is specifically understood and agreed that an inspection and approval of the materials by the Owner, the Design Consultant or any agency retained by any of them shall not in any way subject the Owner to pay for the said materials or any portion thereof, even though incorporated in the Work, if said materials shall in fact turn out to be unfit to be used in the Work, nor shall such inspection be considered as any waiver of objection to the Work on account of the unsoundness or imperfection of the material used.
- 9.3.4 The Contractor warrants that title to all work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "liens"; and that no work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

9.3.5 The Contractor shall submit with the Application for Payment a notarized Contractor's Sales Tax Report of N.C. State and County sales taxes paid during the payment period with respect to building materials, supplies, fixtures, and equipment that have become a part of, or annexed to, a building or structure erected, altered or repaired for the Owner. The Sales Tax Report shall include the vendor from whom the property was purchased, the dates and number of invoices covering the purchase, the total amount of the invoices of each vendor, the North Carolina State and County sales and use tax paid thereof, and the cost of the property withdrawn from the warehouse stock and North Carolina sales or use taxes paid thereof. Items that should not be included are: scaffolding, forms for concrete, fuel for operation of machinery and equipment, tools, equipment, equipment repair parts and equipment rentals.

9.3.6 Unless an interest rate is required by law, Owner shall not pay any interest on an amount owed to Contractor. No interest shall accrue on amounts Owner is authorized by law or by the Contract to withhold or backcharge to Contractor.

9.4 CERTIFICATION OF PAYMENT

9.4.1 The Design Consultant will, after receipt of the Contractor's Application for Payment either issue a Certification of Payment to the Owner, with a copy to the Contractor, for such amount as the Design Consultant determines is properly due, or notify the Contractor in writing of their reasons for withholding a Certification as provided in Paragraph 9.6.1.

9.4.2 The submission and approval of the progress schedule and monthly updates thereof as required by the Contract shall be an integral part and basic element of the application upon which progress payment shall be made. The Contractor shall be entitled to progress payments only as determined from the currently approved and updated schedule.

9.4.3 The signing of a Certification of Payment will constitute a representation by the Design Consultant to the Owner, based on their observations at the site pursuant to their agreements with the Owner, and the data comprising the Application for Payment, that the Work has progressed to the point indicated; that, to the best of their knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to the results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in their Certification); and that the Contractor is entitled to payment in the amount certified. However, by signing a Certification of Payment, the Design Consultant shall not thereby be deemed to represent that it has made exhaustive or continuous on-site inspections to check the quality or quantity of the Work or that it has reviewed the construction means, methods, techniques, sequences, or procedures, or that it has made any examination to ascertain how or for what purpose the Contractor has used the moneys previously paid on account of the Contract Sum.

9.5 PROGRESS PAYMENTS

9.5.1 After a Certification of Payment has been issued, the Owner shall make payment in the manner and within the time provided in the Contract Documents, unless Contractor is in breach of the Contract or otherwise owes the Owner, in which case Owner may withhold an appropriate amount. Unless otherwise stated in the Contract Documents, the Owner shall make payment within 45 days of the Design Consultant's written approval of the Application for Payment.

9.5.2 The Contractor shall promptly pay each Subcontractor (including suppliers, laborers, and

material-men) performing labor or furnishing material or equipment for the Work, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's work. The Contractor shall, by an appropriate agreement with each Subcontractor, also require each Subcontractor to make payments to his Sub-subcontractors in similar manner. The Owner may at any time require proof of payment to a Subcontractor or Sub-subcontractor for work paid by the Owner. Notwithstanding any other provision of the General Conditions, no Contractor, Subcontractor, Sub-subcontractor or Material Supplier shall have any Claim against the Owner, by virtue of the Contract, under any theory, including breach of contract, or third party beneficiary. The Owner shall not be in privity of any contract with any Subcontractor, Sub-subcontractor or Material Supplier pertaining to the Work, the Project and these General Conditions. Also, neither the Contractor, or any Subcontractor or Sub-subcontractor shall have any right to assert a lien on Owner's real property or on any funds held by Owner.

- 9.5.3 The Owner may, on request and at his discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by the Contractor and the action taken thereon by the Design Consultant on account of work done by such Subcontractor.
- 9.5.4 Neither the Owner nor the Design Consultant shall have any obligation to pay or to see to the payment of any moneys to any Subcontractor except as may otherwise be required by law.
- 9.5.5 No Certification for a progress payment, nor any progress payment or final payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.
- 9.5.6 The Contractor agrees to keep the Work and the site of the Project free and clear of all liens related to labor and materials furnished in connection with the Work. Furthermore, pursuant to and in compliance with requirements of Paragraph 9.3.4, the Contractor waives any right he may have to file any type of lien in connection with the Work. Notwithstanding anything to the contrary contained in the Contract Documents, if any such lien is filed or there is evidence to believe that any lien may be filed at any time during the progress of the Work or within the duration of this Contract, the Owner may refuse to make any payment otherwise due the Contractor or may withhold from any payment due the Contractor a sum sufficient in the opinion of the Owner to pay all obligations and expenses necessary to satisfy such lien or the underlying claim represented by such lien. The Owner may withhold such payment unless or until the Contractor, within ten (10) days after demand thereof by the Owner, shall furnish satisfactory evidence that the indebtedness and any lien in respect thereof has been satisfied, discharged and released of record, or that the Contractor has legally caused such lien to be released of record pending the resolution of any dispute between the Contractor and the person or persons filing such lien. If the Contractor shall fail to furnish such satisfactory evidence within ten (10) days of the demand thereof, the Owner may discharge such indebtedness and deduct the amount thereof, together with any and all losses, costs, damages and attorney's fees suffered or incurred by the Owner from any sum payable to the Contractor under the Contract Documents, including but not limited to final payment and retained percentage. This Paragraph 9.5.6 shall be specifically included in all Subcontracts and purchase orders entered into by the Contractor. Notwithstanding any other provision of the Contract, nothing in the Contract shall affect the rights of Subcontractors, Sub-subcontractors, Material Suppliers and Vendors from enforcing any lien rights they have against parties other than the Owner.

9.6 PAYMENTS WITHHELD

9.6.1 The Design Consultant may decline to certify payment and may withhold their Certification of Payment in whole or in part, to the extent necessary to reasonably protect the Owner, if in the Design Consultant's opinion it is unable to make representations to the Owner as provided in Paragraph 9.4.3. If the Design Consultant is unable to make representations to the Owner as provided in Paragraph 9.4.3 and to certify payment in the amount of the Application for Payment, it will notify the Contractor as provided in Paragraph 9.4.1. If the Contractor and the Design Consultant cannot agree on a revised amount, the Design Consultant will promptly issue a Certification of Payment for the amount for which it is able to make such representations to the Owner. The Design Consultant may also decline to certify payment because of subsequently discovered evidence or subsequent observations that may nullify the whole or any part of any Certification of Payment previously issued to such extent as may be necessary in its opinion to protect the Owner from loss, because of:

- .1 Defective Work not remedied,
- .2 Third party claims filed, whether in court, in arbitration or otherwise, or reasonable evidence indicating probable filing of such claims,
- .3 Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment,
- .4 Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum,
- .5 Damage to the Owner or another contractor,
- .6 Reasonable evidence that Contractor will not achieve Substantial Completion and/or Final Completion by the dates specified in the Supplemental Conditions.
- .7 Failure or refusal of the Contractor to carry out the Work in accordance with or to otherwise substantially or materially comply with the Contract Documents,
- .8 Liens filed or reasonable evidence that a lien may be filed for any portion of the Work,
- .9 Failure or refusal of the Contractor to properly schedule and coordinate the Work, to provide progress schedules, reports and updates, or to provide a recovery schedule when required by the Contract,
- .10 Failure or refusal of the Contractor to fully comply with the provisions of Section 6.2 requiring the Contractor to direct certain Claims to Separate Contractors and to defend and indemnify the Owner and/or the Design Consultant in the event Separate Contractors file certain Claims,
- .11 Failure or refusal of the Contractor to submit the required information on Historically Underutilized Businesses (HUB's),
- .12 Failure or refusal of the Contractor to submit a notarized North Carolina State and County Sales Tax Report,
- .13 Any other breach of the Contract by Contractor which has or is likely to cause monetary

damages or loss to Owner, or

.14 Any other reason authorized by the Contract Documents or by law.

9.6.2 When the above grounds in Paragraph 9.6.1 are removed to the Design Consultant's and Owner's satisfaction, payment shall be made for amounts withheld because of them.

9.6.3 Additional services and dispute resolution services by the Design Consultant for which the Contractor is responsible shall be paid by the Contractor at the rate of two hundred dollars (\$200) per hour.

9.7 FAILURE OF PAYMENT

9.7.1 If the Owner does not make payment to the Contractor within the forty-five (45) calendar days after receipt of the Contractor's approved Application for Payment from the Design Consultant through no fault of the Contractor, and the Owner otherwise not being entitled under the Contract Documents or applicable law to withhold payment, then the Contractor may, upon seven (7) additional days' Notice to the Owner, stop the Work until payment of the amount owed according to the Contract Documents has been received. In such event, the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, which shall be effected by appropriate Change Order as provided herein.

9.8 SUBSTANTIAL COMPLETION

9.8.1 When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Paragraph 8.1.3, the Contractor shall prepare for submission to the Owner a list of items which in his opinion are to be completed or corrected and shall request in writing that the Design Consultant and the Owner perform a Substantial Completion inspection. The Design Consultant and the Owner shall review the Contractor's list and shall compile a punch list of items to be corrected and completed. The failure to include any items on such list does not alter the responsibility of the Contractor to complete the Work in accordance with the Contract Documents. When the Design Consultant and the Owner on the basis of an inspection jointly determine that the Work or designated portion thereof is substantially complete, they will then prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

9.8.2 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Design Consultant, the Owner shall make payment, except retainage held pursuant to Paragraph 9.3.2, for such work or portion thereof, as provided in the Contract Documents unless Contractor is in breach of the Contract in which case Owner may withhold an appropriate amount.

9.8.3 The acceptance of Substantial Completion payment shall constitute a waiver of all Claims by the Contractor and its Subcontractors and Sub-subcontractors except those previously made in writing and identified by the Contractor as unsettled at the time the Contractor submits the

Application for Payment for Substantial Completion, and except for the retainage sums due at Final Completion. The Contractor shall indemnify and hold the Owner harmless against any Claims by its Subcontractors and Sub-subcontractors that are waived because they were not made in writing and identified by the Contractor as unsettled when the Contractor submitted the Application for Payment for Substantial Completion.

- 9.8.4 The Owner shall have the option to correct or conclude any and all punch list items not completed by the Contractor to the satisfaction of the Design Consultant and the Owner within thirty (30) days from the actual date of Substantial Completion by utilizing its own forces or by hiring others. The cost of such correction of remaining punch list items by the Owner or others shall be deducted from the final payment to the Contractor. If Contractor does not complete certain punch list items within this time period, specified in Paragraph 9.8.4, all warranties and guarantees for such incomplete punch list items shall become effective upon issuance of final payment for the Project. Paragraph 9.8.4 does not limit the Liquidated Damages provisions related to failure to reach Final Completion by the date stipulated in the Contract Documents.
- 9.8.5 The issuance of the Certificate of Substantial Completion does not indicate final acceptance of the Project by the Owner, and the Contractor is not relieved of any responsibility for the Project except as specifically stated in the Certificate of Substantial Completion.
- 9.8.6 Should the Design Consultant and the Owner determine that the Work or a designated portion thereof is not substantially complete, they shall inform the Contractor in writing stating why the Project or designated portion is not substantially complete. The Contractor shall expeditiously complete the Work and shall re-request in writing that the Design Consultant and the Owner perform a Substantial Completion inspection. Costs, if any, associated with such inspection shall be assessed to the Contractor.
- 9.8.7 Certificate of Substantial Completion will not be issued until the following is completed by Contractor:
- .1 Submit Contractor's list of work not yet complete with proposed time for completion signed by Contractor's project superintendent;
 - .2 Submit Certificate of Occupancy;
 - .3 Submit record drawings, maintenance manuals, final project photos, property surveys;
 - .4 Deliver tools, spare parts, extra stock and similar items;
 - .5 Submit warranties, bonds, maintenance agreements and final certifications;
 - .6 Complete start-up testing of all systems and instruction of the Owner's personnel;
 - .7 Coordinate and complete final changeover of permanent locks and transmit keys to Owner;
 - .8 Discontinue and remove temporary facilities from the site;
 - .9 Complete final cleaning;
 - .10 Advise the Owner of pending insurance changeover requirements;
 - .11 Coordinate and complete changeover of security, telephone, cable and other services; and

- .12 Submit pay application showing 100% complete for work claimed to be substantially complete.
- 9.8.8 The Contractor acknowledges that the Design Consultant and its consultants are only required to conduct up to two (2) comprehensive substantial completion inspections as part of its basic services. If more than two (2) substantial completion inspections are required through no fault of the Design Consultant, the cost of the additional inspections shall be paid by the Contractor.
- 9.9 FINAL COMPLETION AND FINAL PAYMENT
- 9.9.1 Upon receipt of the documentation required by Section 9.8, and of written Notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Design Consultant and the Owner will promptly make such inspection and, when they find the Work acceptable under the Contract Documents and the Contract fully performed, the Design Consultant shall issue a final Certification of Payment stating that to the best of their knowledge, information and belief, and on the basis of their observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract Documents. The final Certification of Payment will constitute that the conditions precedent to the Contractor's being entitled to final payment as set forth in Section 9.8 have been fulfilled. Payment shall be made to the Contractor in the amount certified by the Design Consultant within forty five (45) calendar days after receipt by the Owner of the final Certification of Payment except for any Work for which the Owner is entitled a credit under the Contract Documents.
- 9.9.1.1 The Contractor acknowledges that the Design Consultant and its consultants are only required to conduct up to two (2) comprehensive final completion inspections as part of its basic services. If more than two (2) final completion inspections are required through no fault of the Design Consultant, the cost of the additional inspections shall be paid by the Contractor.
- 9.9.2 Neither the final payment nor the remaining retained percentage shall become due until the Work is free and clear of any and all liens and the Contractor submits to the Owner:
 - .1 An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied;
 - .2 Consent of Surety to final payment;
 - .3 If required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of liens arising out of the Contract, to the extent and in such form as may be designated by the Owner; and
 - .4 A written certification that:
 - .1 The Contractor has reviewed the requirements of the Contract Documents,
 - .2 The Work has been inspected by the Contractor for compliance with all requirements of the Contract Documents,
 - .3 Pursuant to this inspection, the Contractor certifies and represents that the Work complies in all respects with the requirements of the Contract Documents,

- .4 The Contractor further certifies and represents that all equipment and systems have been installed in accordance with the Contract Documents and have been tested in accordance with the Specification requirements and are operational, and
- .5 The Contractor hereby certifies and represents that the Work is complete in all respects and ready for final inspection.

9.9.3 If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against any loss. If any such lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien or claims, including all costs and reasonable attorney's fees. The Owner may withhold from the final payment any sum that the Owner has reason to believe may be needed to satisfy any lien, claim or threat of lien arising from the Work. The Owner may deduct from the final payment an amount equal to any costs, expenses and attorney's fees incurred by the Owner in removing or discharging any liens or claim arising from the Work.

9.9.4 If, after Substantial Completion of the Work, Final Completion thereof is materially delayed through no fault of the Contractor or by the issuance of Change Orders affecting Final Completion, and the Owner so confirms, the Owner shall, upon application by the Contractor and certification by the Design Consultant, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for the portion of the Work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Section 7.4, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Design Consultant prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

9.9.5 The making of final payment shall constitute a waiver of all Claims by the Owner against the Contractor except those arising from:

- .1 Unsettled liens, and claims against the Owner or the Design Consultant, or their employees, agents, or representatives;
- .2 Faulty, defective or non-conforming Work;
- .3 Failure of the Work to comply with the requirements of the Contract Documents;
- .4 Terms of any warranties contained in or required by the Contract Documents;
- .5 Damages incurred by the Owner resulting from lawsuits brought against the Owner, the Design Consultant, or their agents, employees or representatives because of failures or actions on the part of the Contractor, his Subcontractors, Sub-subcontractors, or any of their employees, agents or representatives;
- .6 Fraud or bad faith committed by the Contractor or any Subcontractor or supplier during performance of the Work but discovered by Owner after final payment; or
- .7 Claims about which Owner did not have actual knowledge or which increase in scope or amount at the time of final payment.

- 9.9.6 The acceptance of final payment shall constitute a waiver of all Claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final Application for Payment.
- 9.9.6.1 Notwithstanding any other provision of the Contract, Owner may withhold from Contractor payment otherwise due, as a result of any losses, expenses costs or damages suffered or anticipated to be suffered by Owner as a result of Contractor's breach of any provision of the Contract, including but not limited to Liquidated Damages or backcharges against Contractor.
- 9.10 OWNER'S RIGHT TO OCCUPY INCOMPLETE WORK
- 9.10.1 Should the Project, or any portion thereof, be incomplete for Substantial or Final Completion at the scheduled date or dates, the Owner shall have the right to occupy any portion of the Project. In such an event, the Contractor shall not be entitled to any extra compensation on account of said occupancy by the Owner or by the Owner's use of the Project, nor shall the Contractor interfere in any way with said use of the Project. Further, in such an event, the Contractor shall not be entitled to any extra compensation on account of the Owner's occupancy and use of the Project, nor shall the Contractor be relieved of any responsibilities of the Contract including the required times of completion. Such occupancy by the Owner shall not, in itself, constitute Substantial or Final Completion.
- 9.10.2 If the Owner exercises his rights under the foregoing and occupies the full Project, then there shall be no Liquidated Damages on account of failure on the Contractor's part to reach Substantial Completion from that date forward. This provision does not affect, however, any Liquidated Damages that would be assessed for any period of time between the contractual date of Substantial Completion and the date of any such occupancy. Further, this provision would have no effect on Liquidated Damages assessed on account of late Final Completion.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

- 10.1 SAFETY PRECAUTIONS AND PROGRAMS
- 10.1.1 The Owner, the Design Consultant, or their agents, employees or representatives are not responsible for the means, methods, techniques, sequences or procedures utilized by the Contractor, or for safety precautions and programs in connection with the Work. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. This requirement applies continuously throughout the Contract performance, until final payment is made and all punch list and warranty work is performed properly, and is not limited to regular working hours.
- 10.2 SAFETY OF PERSONS AND PROPERTY
- 10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:
- .1 All employees on the Work and all other persons who may be affected thereby;
 - .2 All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his

Subcontractors or Sub-subcontractors, machinery, equipment and all hazards shall be guarded or eliminated in accordance with all applicable safety regulations; and

- .3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and overhead or underground utilities not designated for removal, relocation or replacement in the course of construction.
- 10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, permits, rules, regulations and lawful orders of any public authority bearing on the safety or persons or property or their protection from damage, injury or loss.
- 10.2.2.1 The Contractor shall at all times safely guard the Owner's property from injury or losses in connection with the Contract. He shall at all times safely guard and protect his own work and adjacent property as provided by law and the Contract Documents, from damage. All passageways, guard fences, lights and other facilities required for protection by applicable safety regulations must be provided and maintained.
- 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.
- 10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.
- 10.2.5 The Contractor shall promptly remedy at his own cost and expense all damage or loss to any property referred to in Subparagraphs 10.2.1.2 and 10.2.1.3 caused by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible under Subparagraphs 10.2.1.2 and 10.2.1.3, except damage or loss attributable solely to the acts or omissions of the Owner or Design Consultant or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to his obligations under Section 4.21. The Contractor shall perform such restoration by underpinning, repairing, rebuilding, replanting, or otherwise restoring as may be required or directed by the Owner, or shall make good such damage in a satisfactory and acceptable manner. In case of failure on the part of the Contractor to promptly restore such property or make good such damage, the Owner may, upon two (2) calendar days Notice, proceed to repair, rebuild or otherwise restore such property as may be necessary and the cost thereof, or a sum sufficient in the judgment of the Owner to reimburse the owners of property so damaged, will be deducted from any monies due or to become due the Contractor under the Contract.
- 10.2.6 The Contractor is responsible for the proper packing, shipping, handling and storage (including but not limited to shipment or storage at the proper temperature and humidity) of materials to be incorporated in the Work, so as to insure the preservation of the quality and fitness of the material for proper installation and incorporation in the Work, as required by the Contract Documents. For example, but not by way of limitation, Contractor shall, when necessary, place material on wooden platforms or other hard and clean surfaces and not on the ground and/or place such material under cover in any appropriate shelter or facility. Stored materials or equipment shall be located so as to facilitate proper inspection. Material and equipment which

is delivered crated shall remain crated until ready for installation. Lawns, grass plots or other private property shall not be used for storage purposes without the written permission of the Owner or lessee unless otherwise within the terms of the easements obtained by the Owner.

- 10.2.6.1 It shall be the responsibility of the Contractor in his preparation of phasing schedule of work operations after consulting with the other Prime Contractors to designate areas in which each Prime Contractor may store materials. Areas designed shall meet with the approval of the Design Consultant.
- 10.2.7 The Contractor shall give notice in writing at least forty eight (48) hours before breaking ground, to all persons, public utility companies, owners of property having structures or improvements in proximity to site of the Work, superintendents, inspectors, or those otherwise in charge of property, streets, water pipes, gas pipes, sewer pipes, telephone cables, electric cables, railroads or otherwise, who may be affected by the Contractor's operation, in order that they may remove any obstruction for which they are responsible and have representative on site to see that their property is properly protected. Such notice does not relieve the Contractor of responsibility for all damages, claims, or defense or indemnification of all actions against Owner resulting from performance of such work in connection with or arising out of Contract. The Contractor shall ensure that all appropriate safety precautions are taken when working near existing utilities.
- 10.2.8 The Contractor shall investigate, locate, mark and protect all utilities encountered or to be encountered while performing the Work, whether indicated on the Drawings or not. The Contractor shall maintain utilities in service until moved or abandoned. The Contractor shall exercise due care when excavating around utilities and shall restore any damaged utilities to the same condition or better as existed prior to starting the Work, at no cost to the Owner. The Contractor shall maintain operating utilities or other services, even if they are shown to be abandoned on the Contract Drawings, in service until new facilities are provided, tested and ready for use.
- 10.2.9 The Contractor shall return all improvements on or about the site and adjacent property which are not shown to be altered, removed or otherwise changed to conditions which existed prior to starting the Work. The Contractor shall video record all areas or otherwise document the conditions existing at the site and in and around existing buildings prior to starting the Work. Submit documentation to the Design Consultant prior to beginning the Work.
- 10.2.10 The Contractor shall protect the Work, including but not limited to, the site, stored materials and equipment, excavations, and excavated or stockpiled soil or other material, intended for use in the Work, and shall take all necessary precautions to prevent or minimize damage to same or detrimental effect upon his performance or that of his Subcontractors, caused by or due to rain, snow, ice, run-off, floods, temperature, wind, dust, sand and flying debris; for example, but not by way of limitation, Contractor shall, when necessary, utilize temporary dikes, channels or pumping to carry-off divert or drain water, and shall as necessary tie-down or otherwise secure the Work and employ appropriate covers and screens.
- 10.2.11 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents and the protection of material, equipment and property. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner.
- 10.2.11.1 In the event of accidents involving personal injury or property damage, the Contractor shall immediately notify the Owner and Design Consultant, furnishing as much data as is available. As soon as practicable, the Contractor shall furnish to the Owner and Design Consultant a

written report indicating the extent of the damage, the persons involved, the employer of the persons involved, and the number of days each person was hospitalized.

10.2.12 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

10.2.13 Notification to the Contractor by the Owner or the Design Consultant of a safety violation will in no way relieve the Contractor of sole and complete responsibility for the correctness of said violation or of sole liability for the consequences of said violation.

10.3 EMERGENCIES

10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. The Contractor shall notify the Owner of the situation and all actions taken immediately thereafter. If, in the opinion of the Contractor, immediate action is not required, the Contractor shall notify the Owner of the emergency situation and proceed in accordance with the Owner's instructions. Provided, however, if any loss, damage, injury or death occurs that could have been prevented by the Contractor's prompt and immediate action, the Contractor shall be fully liable for all costs, damages, claims, actions, suits, attorney's fees and all other expenses arising therefrom or relating thereto.

10.4 HAZARDOUS MATERIALS

10.4.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Design Consultant in writing.

10.4.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such hazardous material or substance is found to be present, to cause it to be rendered harmless or to verify that it has already been rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Design Consultant the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Design Consultant will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Design Consultant has a reasonable objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Design Consultant have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up if the affected Work is on the Project's critical path as demonstrated by the approved Project Schedule.

- 10.4.3 The Owner shall not be responsible under this Article 10.4 for materials or substances the Contractor or its subcontractor brings to the site.
- 10.4.4 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and/or negligently handles, or (2) where the Contractor fails to perform its obligations under Article 10.4, unless the cost and expense are due to the Owner's fault or negligence.

ARTICLE 11

INSURANCE

11.1 CONTRACTOR'S LIABILITY INSURANCE

- 11.1.1 The Contractor shall purchase and maintain in companies properly licensed by the Insurance Department of the State of North Carolina and acceptable to the Owner such insurance as will protect him, the Owner, and the Owner's agents, representatives, and employees from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:
- .1 Claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts (with Workmen's Compensation and Employer's Liability Insurance in amounts not less than those necessary to meet the statutory requirements of the state(s) having jurisdiction over any portion of the Work);
 - .2 Claims for damages because of bodily injury, sickness or disease, or death of his employees; the Contractor will require his Subcontractors to similarly provide Workmen's Compensation Insurance for all of the latter's employees;
 - .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
 - .4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;
 - .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and
 - .6 Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- 11.1.2 The insurance required by Paragraph 11.1.1 shall be primary and non-contributing to any insurance possessed or procured by the Owner, and limits of liability shall be not less than those set forth in these General Conditions of the Contract or required by law, whichever is greater.
- 11.1.3 The insurance required by the Contract shall include contractual liability insurance applicable to the Contractor's obligations under the Contract
- 11.1.4 Without limiting the above during the term of the Contract, the Contractor and each Subcontractor shall, at their own expense, purchase and maintain the following insurance with

companies properly licensed by the Insurance Department of the State of North Carolina and satisfactory to the Owner.

- .1 Worker's Compensation including Occupational Disease and Employer's Liability Insurance.
 - .1 Statutory - Amount and coverage as required by State of North Carolina Worker's Compensation laws.
 - .2 Employer's Liability
 - \$1,000,000 Each Accident
 - \$1,000,000 Policy Limit
 - \$1,000,000 Each Employee
- .2 Commercial General Liability (Occurrence Form) - The Contractor shall provide during the life of the Contract such Commercial General Liability (Occurrence Form) Insurance as shall protect him and any Subcontractor performing work under the Contract from claims for damages for Bodily Injury including accidental death, as well as from claims for Property Damage which may arise from operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by either of them. This insurance shall be on the Standard Insurance Services Office, Inc. (ISO) Commercial Liability Occurrence Form or other form reasonable acceptable to Owner. The Contractor shall procure insurance coverage for direct operations, sublet work, elevators, contractual liability and completed operations with limits not less than those stated below:
 - .1 A Combined Single Limit for Bodily Injury, Property Damage and Personal Injury of:
 - Limits of Insurance
 - \$2,000,000 General Aggregate (except Products – Completed Operations) Limit
 - \$2,000,000 Products – Completed Operations Aggregate Limit
 - \$1,000,000 Personal and Advertising Injury Limit
 - \$1,000,000 Each Occurrence Limit
 - .3 Property Damages, including Broad Form Property Damage and Explosion, Collapse, Underground property damage coverages, and blasting, where necessary;
 - .4 Completed Operations Liability: Continuous coverage in force for one year after completion of the Work;
 - .5 Commercial Automobile Insurance, including coverage for owned, non-owned and hired vehicles - with limits not less than those stated below:
 - .1 A Combined Single Limit for Bodily Injury and Property Damage of \$1,000,000.
 - .6 Umbrella Liability Insurance: Policy to "pay on behalf of the Insured"
 - Limits of Liability:
 - .1 Contract Amount: less than or equal to \$25,000,000:
 - Requires Umbrella Liability Insurance Limit of \$5,000,000.
 - .2 Contract Amount: greater than \$25,000,000:

Requires Umbrella Liability Insurance Limit of \$10,000,000.

- 11.1.5 The insurance required by Section 11.1 shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater.
- 11.1.6 Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least thirty (30) days' prior written Notice has been given to the Owner. Failure to provide such Notice shall not limit the liability of the Insurer, its agents or representatives.
- 11.1.7 All insurance policies required in this Article, except Worker's Compensation and Commercial Automobile, shall name the Owner as additional named insured for the insurance.
- 11.1.8 The Contractor shall not commence the Work under the Contract until he has obtained all the insurance required hereunder and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his subcontract until all similar insurance required of the Subcontractor has been so obtained and approved. Approval of the insurance by the Owner shall not relieve or decrease the liability of the Contractor hereunder.
- 11.1.9 The Commercial General Liability and Workers Compensation Policies provided by the Contractor shall have endorsements waiving subrogation against the Owner.

11.2 PROPERTY INSURANCE

- 11.2.1 The Contractor shall purchase and at all times maintain such insurance as will protect the Contractor, the Owner, Subcontractors and Sub-subcontractors from loss or damage to the Work or property in the course of construction, including all machinery, materials and supplies on the premises or in transit thereto and intended to become a part of the finished Work until Final Completion. This insurance shall be in the form of "Builders Risk Covered Cause of Loss Form", or equivalent form, to include but not limited to theft, collapse, earth movement, flood, and portions of the Work stored on site, off site and in transit. Any deductible provision in such insurance shall not exceed ten thousand dollars (\$10,000). Notwithstanding any such deductible provision, the Contractor shall remain solely liable for the full amount of any item covered by such insurance. Such insurance shall be in the initial Contract Sum and shall be increased at Contractor's expense in the amount of all additions to the Contract Sum. Such insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.
- 11.2.2 Any loss insured under Paragraph 11.2.1 is to be adjusted with the Owner and made payable to the Owner as trustee for the insureds, as their interests may appear, subject to the requirements of Paragraph 11.2.4. The Contractor shall pay each Subcontractor a just share of any insurance moneys received by the Contractor, and by appropriate agreement, written where legally required for validity, shall require each Subcontractor to make payments to his Sub-subcontractors in similar manner.
- 11.2.3 The Owner and Contractor waive all rights against each other for damages caused by fire or other perils to the extent their Claims are covered by insurance obtained pursuant to this Section 11.2, or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance. The Contractor shall require, by appropriate agreement, written where legally required for validity, similar waivers in favor of the Owner and the Contractor by Subcontractors and Sub-subcontractors. With respect to the waiver of rights of

recovery, the term Owner shall be deemed to include, to the extent covered by property insurance applicable thereto, his consultants, employees, and agents and representatives. The Contractor waives as against any Separate Contractor described in Article 6, all rights for damages caused by fire or other perils in the same manner as is provided above as against the Owner. The Owner shall require, by appropriate agreement, written where legally required for validity, similar waivers in favor of the Contractor by any Separate Contractor and his subcontractors and sub-subcontractors.

11.2.4 The Owner as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within five (5) days after the occurrence of loss to the Owner's exercise of this power, and if such objection is made, the matter shall be decided by a court of competent jurisdiction or as the parties in interest otherwise agree. The Owner as trustee shall, in that case, make settlement with the insurers in accordance with the orders of the court or as otherwise agreed by the parties in interest.

11.2.5 If the Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion thereof, such occupancy or use shall not commence prior to a time mutually agreed to by the Owner and Contractor and to which the insurance company or companies providing the property insurance have consented by endorsement to the policy or policies. This insurance shall not be canceled or lapsed on account of such partial occupancy or use. Consent of the Contractor and of the insurance company or companies to such occupancy or use shall not be unreasonably withheld.

11.2.6 The Contractor bears the risk of loss or damage to the Work, the Project, materials stored on site or off site, and Owner's improvements and property under Contractor's control, both during construction and prior to Substantial Completion.

11.3 EFFECT OF SUBMISSION OF CERTIFICATES

11.3.1 The Owner shall be under no obligation to review any Certificates of Insurance provided by the Contractor or to check or verify the Contractor's compliance with any and all requirements regarding insurance imposed by the Contract Documents. The Contractor is fully liable for the amounts and types of insurance required herein and is not excused should any policy or certificate of insurance provided by the Contractor not comply with any and all requirements regarding insurance imposed by the Contract Documents.

11.4 FAILURE OF COMPLIANCE

11.4.1 Should the Contractor fail to provide and maintain in force any and all insurance, or insurance coverage required by the Contract Documents or by law, or should a dispute arise between Owner and any insurance company of Contractor over policy coverage or limits of liability as required herein, the Owner shall be entitled to recover from the Contractor all amounts payable, as a matter of law, to Owner or any other parties, had the required insurance or insurance coverage been in force. Said recovery shall include, but is not limited to interest for the loss of use of such amounts of money, plus all attorney's fees, costs and expenses incurred in securing such determination and any other consequential damages arising out of the failure of the Contractor or insurance company to comply with the provisions of the Contract Documents, or any policy required hereby, or any other requirements regarding insurance imposed by law. Nothing herein shall limit any damages for which Contractor is responsible as a matter of law.

11.5 OWNER'S INSURANCE

11.5.1 Property Insurance: The Owner, at his option, may purchase and maintain such insurance as will insure him against loss of use of his property due to fire or other hazards, however caused.

11.5.2 Commercial Public Liability Insurance: The Owner, at his option, may purchase and maintain insurance which will insure and protect him against claims involving bodily injury and property damage to the public. The Owner does not request his insurer to waive any right of subrogation against the Contractor from claims under this coverage.

11.6 LICENSED INSURANCE COMPANIES

11.6.1 All insurance companies providing the above insurance shall be licensed by the Insurance Department of the State of North Carolina and have a minimum AM Best "A" rating or similar rating from another rating agency reasonably acceptable to Owner.

ARTICLE 12

CHANGES IN THE WORK

12.1 GENERAL PROVISIONS RELATED TO CHANGES

12.1.1 A Construction Change Directive is a document issued pursuant to this Paragraph 12.1.1. The Owner may, at any time, without the agreement of the Contractor, by written order signed by the Owner and Design Consultant designated or indicated to be a Construction Change Directive, make any Changes in the Work or add to or subtract from the Work within the general scope of the Contract. A Change in the Work is defined as changes within the general scope of the Contract, including, but not limited to changes:

- .1 In the Specifications or Drawings;
- .2 In the sequence, method or manner of performance of the Work;
- .3 In the Owner-furnished facilities, equipment, materials, services or site; or
- .4 Directing acceleration in the performance of the Work.

12.1.2 A Change Order is a document executed pursuant to this Paragraph 12.1.2. The Owner and Contractor may agree to Changes in the Work, the Contract Sum, the Contract Time and any other change in the Contract by written agreement signed by Owner, Contractor and Design Consultant designated or indicated to be a Change Order. If the Contractor, subsequent to the issuance of a Construction Change Directive, agrees to its terms including any applicable adjustment to the Contract Sum and Contract Time, Contractor shall sign it and it shall become a Change Order.

12.1.3 The Contractor shall not be entitled to any amount for indirect costs, damages or expenses of any nature, including, but not limited to, so-called "impact" costs, labor inefficiency, wage, material or other escalations beyond the prices upon which the Proposal is based and to which the parties have agreed pursuant to the provisions of Article 12, and which the Contractor, its Subcontractors or Sub-subcontractors or any other person may incur as a result of delays, interferences, suspensions, changes in sequence or the like, for whatever cause, whether reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable, arising

from the performance of any and all Changes in the Work performed pursuant to this Article 12, unless the delay is caused solely by the Owner or its agent. It is understood and agreed that the Contractor's sole and exclusive remedy in the event the delay is caused solely by the Owner or its agent shall be recovery of his direct costs as compensable hereunder and an extension of the Contract Time, but only in accordance with the provisions of the Contract Documents. The phrase "Owner or its agent" as used in the Contract, does not include the Prime Contractors or their Subcontractors.

- 12.1.4 No Claim by the Contractor shall be allowed if asserted after final payment under this Contract. No Claim relating to or flowing from a particular change shall be allowed after execution of the Change Order relating to that change or commencement of the change by the Contractor except as specifically provided in Paragraph 12.2.4.
- 12.1.5 If any dispute should arise between the parties with respect to an increase or decrease in the Contract Sum or an expansion or contraction in the Contract Time as a result of a Change in the Work, the Contractor shall not suspend performance of a Change in the Work or the Work itself unless otherwise so ordered by the Owner in writing. The Owner shall, however, pay to the Contractor up to the Owner's reasonable estimated value of the Change in the Work, regardless of the dispute, if said Change in the Work will result in an increase in the Contract Sum; and the Owner shall have the right to withhold payment from the Contractor in an amount up to the Owner's reasonable estimated value of the Change in the Work, regardless of the dispute, if said Change in the Work will result in a decrease in the Contract Sum.
- 12.1.6 No Change in the Work shall be performed without a fully executed Change Order to the Contract a fully executed Construction Change Directive or other Modification to the Contract.
- 12.1.7 If the Contractor intends to assert a Claim under this Article, he must, within ten (10) days after receipt of a Construction Change Directive, Notify the Owner by written statement setting forth the specific nature and cost of such Claim, unless this period is extended by the Owner. The statement of Claim shall include all direct, indirect and impact costs associated with the change, as well as the Contractor's estimate of the schedule impact of the change, if any. The Contractor and its Subcontractors shall not be entitled to reimbursement for any Claims that are not submitted in strict conformance with the Contract. The Contractor shall indemnify and hold the Owner harmless against any Claims by Subcontractors that are waived because they are not submitted in strict conformance with the Contract.
- 12.2 OWNER DIRECTED CHANGES REQUIRING AN INCREASE IN CONTRACT SUM.
(For decreases in Contract Sum, refer to Section 12.6)
- 12.2.1 If the Change in the Work will result in an increase in the Contract Sum, the Owner shall have the right to require the performance thereof on a lump sum basis, a unit price basis or a time and material basis, all as hereinafter more particularly described (the right of the Owner as aforesaid shall apply with respect to each such Change in the Work).

If the Owner elects to have the Change in the Work performed on a lump sum basis, its election shall be based on a lump sum Proposal which shall be submitted by the Contractor to the Owner within ten (10) days of the Contractor's receipt of a request therefore (but the Owner's request for a lump sum Proposal shall not be deemed an election by the Owner to have the Change in the Work performed on a lump sum basis). The Contractor's Proposal shall be itemized and segregated by labor 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 will perform any portion of the Change in the Work and of any persons who

will furnish materials or equipment for incorporation therein. The Proposal shall also include the Contractor's estimate of the time required to perform said changes. The Contractor shall provide any documentation that may be requested by the Owner or Design Consultant to support the change proposal, including but not limited to payroll records, insurance rates, material quotes, and rental quotes.

The portion of the Proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, may include reasonably anticipated gross wages of job site labor, including foremen, who will 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 time, if overtime is anticipated, 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) and up to fifteen percent (15%) of such anticipated gross wages, but not payroll costs, as overhead and profit for the Contractor or any such Subcontractor, as applicable (said overhead and profit to include all supervision except foremen). Payroll costs are limited to 39% of the net pay of the worker.

The portion of the Proposal relating to materials may include the reasonably anticipated direct costs to the Contractor or to any of its Subcontractors of materials to be purchased for incorporation in the Change in the Work, plus transportation and applicable sales and use taxes and up to fifteen percent (15%) of said direct material costs as overhead and profit for the Contractor or any such Subcontractor (said overhead and profit to include all small tools), and may further include the Contractor's and any of its Subcontractor's reasonably anticipated rental costs in connection with the Change in the Work (either actual or discounted local published rates), plus up to eight percent (8%) thereof as overhead and profit for the Contractor or any such Subcontractors, as applicable. The Contractor shall provide an itemized breakdown of all transportation and shipping costs, including receipts documenting the expenses. Notwithstanding the above, overhead and profit shall not be applied to any sales tax paid for any purpose or to any transportation or shipping costs incurred by the Contractor or any subcontractor. If any of the items included in the lump sum Proposal are covered by unit prices contained in the Contract Documents, the Owner may, if it requires the Change in the Work to be performed on a lump sum basis, elect to use these unit prices in lieu of the similar items included in the lump sum Proposal, in which event an appropriate deduction will be made in the lump sum amount prior to the application of any allowed overhead and profit percentages. No overhead and profit shall be applied to any unit prices.

The lump sum Proposal may include up to eight percent (8%) of the amount which the Contractor will pay to any of its Subcontractors for Changes in the Work as overhead and profit for the Contractor. The Contractor shall not be reimbursed for the costs of the Subcontractors' Payment and Performance Bonds, as such bonding is not required by the Owner.

12.2.2 In the event that the Contractor fails to submit his Proposal within the designated period, the Owner may order the Contractor to proceed with the Change to the Work and the Contractor shall so proceed. The Owner shall unilaterally determine the reasonable cost and time to perform the Work in question, which determination shall be final and binding upon the Contractor. The Contractor may dispute such action in accordance with the Article 15.

12.2.3 In the event that the parties are unable to agree as to the reasonable cost and time to perform the Change in the Work based upon the Contractor's Proposal and the Owner does not elect to have the Change in the Work performed on a time and material basis, the Owner may choose to make a determination of the reasonable cost and time to perform the Change in the Work, based upon its own estimates, the Contractor's submission or a combination thereof. A Construction Change

Directive shall be issued in this case for the amounts of cost and time determined by the Owner and shall become final and binding upon the Contractor, subject to Contractor's right to dispute such action in accordance with Article 15. Owner has the right to direct by Construction Change Directive a Change in the Work, which is the subject of such Change Order. Failure of the parties to reach agreement regarding the cost and time of the performing the Construction Change Directive, shall not relieve the Contractor from performing the Change in the Work promptly and expeditiously.

12.2.3.1 The Owner reserves the right to reject the Contractor's Proposal for a Change in the Work and to elect to perform said Work using a Separate Contractor. Under such circumstances, all provisions of Article 6 shall be in force.

12.2.4 If the Owner elects to have the Change in the Work performed on a time and material basis, the same shall be performed, whether by the Contractor's forces or the forces of any of its Subcontractors or Sub-subcontractors, at actual cost to the entity performing the Change in the Work (without any charge for administration, clerical expense, supervision or superintendence of any nature whatsoever, including foremen, or the cost, use or rental of tools or plant), plus fifteen percent (15%) thereof as the total overhead and profit (except that said fifteen percent (15%) shall not be applied against any payroll costs, as set forth in Paragraph 12.2.1.) The Contractor shall submit to the Owner daily time and material tickets, on a daily basis to include the identification number assigned to the Change in the Work, the location and description of the Change in the Work, the classification of labor employed (and names and social security numbers), the materials used, the equipment rented (not tools) and such other evidence of cost as the Owner may require. The Owner may require authentication of all time and material tickets and invoices by persons designated by the Owner for such purpose. The failure of the Contractor to secure any required authentication shall, if the Owner elects to treat it as such, constitute a waiver by the Contractor of any Claim for the cost of that portion of the Change in the Work covered by a non-authenticated ticket or invoice; provided, however, that the authentication of any such ticket or invoice by the Owner shall not constitute an acknowledgment by the Owner that the items thereon were reasonably required for the Change in the Work.

12.2.5 No overhead and profit will be paid by the Owner on account of a Change in the Work except as specifically provided in Section 12.2. Overhead and profit, as allowed under Section 12.2, shall be deemed to include all costs and expenses which the Contractor or any of its Subcontractors may incur in the performance of a Change in the Work and which are not otherwise specifically recoverable by them pursuant to Section 12.2.

12.3 CONTRACTOR NOTICE OF CHANGE

12.3.1 If the Contractor or any of its Subcontractors asserts that any event or occurrence has caused a Change in the Work which change causes an increase or decrease in the Contractor's or its Subcontractors cost or the time required for the performance of any part of the Work under the Contract, including Work not affected directly by the change, the Contractor shall, within ten (10) days of such event, give the Owner written Notice as herein required. Said Notice shall include the instructions or circumstances that are the basis of the Claim and the Contractor's best estimate of the cost and time involved.

12.4 MINOR CHANGES IN THE WORK

12.4.1 The Owner shall have authority to order minor Changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order, and shall be binding

on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

12.4.2 The Contractor shall not perform any Changes in the Work unless authorized in writing by the Design Consultant or Owner.

12.5 DIFFERING SITE CONDITIONS

12.5.1 Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the Drawings or indicated in the Specifications or differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract, or different from that shown on surveys or tests provided in the bid materials at the time the Owner solicited bids from the construction of the Project, he shall immediately give Notice to the Owner of such conditions before they are disturbed. The Owner and the Design Consultant shall thereupon promptly investigate the conditions and if they find that they materially differ from those shown on the Drawings or indicated in the Specifications, they shall at once make such changes in the Drawings and/or Specifications as they may find necessary. Any increase or decrease of cost resulting from such changes shall be adjusted in the manner provided herein for adjustments as to extra and/or additional work and changes. However, neither the Owner nor the Design Consultant shall be liable or responsible for additional work, costs or Changes to the Work due to material differences between actual conditions and any geotechnical, soils and other reports, surveys and analyses made available for the Contractor's review at the time the Owner solicited bids for the construction of the Project.

12.6 OWNER DIRECTED CHANGES REQUIRING A DECREASE IN CONTRACT SUM.

12.6.1 If the Change in the Work will result in a decrease in the Contract Sum, the Owner may request a quotation by the Contractor of the amount of such decrease. The following provisions shall apply:

The portion of the Proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, shall include reasonably anticipated gross wages of job site labor, including foremen, who would have been directly involved in the Work that has been deleted from the Contract, (for such time as they would have been so involved), plus payroll costs (including premium costs of overtime time, if overtime was anticipated, 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) and seven percent (7%) of such anticipated gross wages, but not payroll costs, as overhead and profit not incurred or earned by the Contractor or any such Subcontractor, as applicable (said overhead and profit to include all supervision except foremen).

The portion of the Proposal relating to materials shall include the reasonably anticipated direct costs which would have been incurred by the Contractor or to any of its Subcontractors of materials which would have been purchased for incorporation in the Work but which has been deleted from the Contract, plus transportation and applicable sales and use taxes which will be avoided and seven percent (7%) of said direct material costs as overhead and profit not incurred or earned by the Contractor or any such Subcontractor (said overhead and profit to include all small tools), and shall further include the Contractor's and any of its Subcontractor's reasonably anticipated rental costs which will be avoided (either actual or discounted local published rates), plus five percent (5%) thereof as overhead and profit not incurred or earned by the Contractor or any such Subcontractors, as applicable. If any of the items included in the lump sum Proposal are covered by unit prices contained in the Contract Documents, the Owner may elect to use

these unit prices in determining the amount of reduction to the Contract Sum as a result of a deletion of Work from the Contract. No overhead and profit shall be applied to any unit prices for purposes of calculation such reduction in the Contract Sum.

The lump sum Proposal for Work which would have been performed by any Subcontractors shall include four percent (4%) of that amount as an estimate of the Contractor's overhead and profit that will not be earned by Contractor due to the decrease in the Contract Sum.

The Contractor's quotation shall be forwarded to the Owner within ten (10) days of the Owner's request and, if acceptable to the Owner, shall be incorporated in the Change Order. If not acceptable, the parties shall make every reasonable effort to agree as to the amount of such decrease, which may be based on a lump sum properly itemized, on unit prices stated in the Contract Documents and/or on such other basis as the parties may mutually determine. If the parties are unable to so agree, the amount of such decrease shall be the total of the estimated reduction in actual cost of the Work, as determined by the Owner in its reasonable judgment, plus overhead and profits stated above. This shall become final and binding upon the Contractor, subject to Contractor's right to dispute such action in accordance with the Article 15.

ARTICLE 13

UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any portion of the Work is covered contrary to the request of the Owner or the Design Consultant or to requirements specifically expressed in the Contract Documents or to requirements of applicable construction permits, it must, if required in writing by the Owner, be uncovered for his observation and shall be replaced at the Contractor's expense.

13.1.2 If any other portion of the Work has been covered which the Design Consultant or the Owner has not specifically requested to observe prior to being covered, either may request to see such portion of the Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it is found that this condition was caused by the Owner, in which event the Owner shall be responsible for the payment of such costs. If such condition was caused by a Separate Contractor, Contractor may proceed against and only against, said Separate Contractor as provided in Article 6. Any costs to the Owner pursuant to this Paragraph shall be determined in accordance with the provisions of Article 12.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall promptly reconstruct, replace or correct portions of the Work rejected by the Design Consultant or Owner as defective or as failing to conform to the Contract Documents or as not in accordance with the guarantees and warranties specified in the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected portions of the Work, including compensation for the Design Consultant's and the Owner's additional construction management services made necessary thereby.

13.2.2 The Contractor, unless removal is waived by the Owner, shall remove from the site all portions

of the Work which are defective or non-conforming, or if permitted or required, he shall correct such portions of the Work in place at his own expense promptly after receipt of Notice, and such rejected Work shall not thereafter be tendered for acceptance unless the former rejection or requirement for correction is disclosed.

- 13.2.3 If the Contractor does not proceed with the correction of such defective or non-conforming portions of the Work within a reasonable time fixed by written Notice from the Owner or Design Consultant, the Owner may either (1) by separate contract or otherwise replace or correct such portions of the Work and charge the Contractor the cost incurred by the Owner thereby and remove and store the materials or equipment at the expense of the Contractor, or (2) terminate this Contract for default as provided in Section 14.3, or both, or take any other measure allowed by law.
- 13.2.4 The Contractor shall bear the cost of making good all work of the Owner or Separate Contractors destroyed or damaged by such correction or removal.
- 13.2.5 Nothing contained in this Section 13.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents, including Section 4.6 hereof. The establishment of the time period of one year after the date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his obligations.
- 13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK
- 13.3.1 If the Owner prefers to accept defective or non-conforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable, or the Owner may elect to accept payment in materials or services, in lieu of a reduction in the Contract Sum. If the amount of a reduction is determined after final payment, it shall be paid to the Owner by the Contractor.

ARTICLE 14

TERMINATION OF THE CONTRACT

- 14.1 TERMINATION BY THE CONTRACTOR
- 14.1.1 If the Work is stopped for a period of one hundred twenty (120) days by the Owner or under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, and through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, then the Contractor may, upon seven (7) additional days' written Notice to the Owner and the Design Consultant, terminate the Contract and recover from the Owner payment on a quantum merit basis, for all Work executed for which Contractor has not previously been paid, less any amounts Contractor may owe Owner under the Contract Documents and less any amounts Owner is entitled to withhold from Contractor or backcharge to the Contractor under the Contract Documents or pursuant to law. The Contractor shall not be entitled to collect and hereby expressly waives any overhead or profit on Work not performed and any damages related to that

portion of the Contract which has been terminated.

14.2 TERMINATION FOR CONVENIENCE OF THE OWNER

14.2.1 The Owner may, at any time upon ten (10) days written Notice to the Contractor and to the Contractor's Surety, which Notice shall specify that portion of the Work to be terminated and the date said termination is to take effect, terminate (without prejudice to any right or remedy of the Owner) the whole or any portion of the Work for the convenience of the Owner. The Contractor's sole remedy, in the event of such termination, will be the allowable termination costs permitted by Section 14.4. Contractor shall include termination clauses identical to Article 14 in each of his subcontracts.

14.3 DEFAULT TERMINATION

14.3.1 Ten (10) days after written Notice is mailed to the Contractor and to the Contractor's Surety, the Owner may terminate (without prejudice to any right or remedy of the Owner or any subsequent buyer of any portion of the Work) the employment of the Contractor and his right to proceed either as to the whole or any portion of the Work required by the Contract Documents and may take possession of the Work and complete the Work by contract or otherwise in any one of the following circumstances:

- .1 If the Contractor or its Surety refuses or fails to prosecute the Work or any separable part thereof with such diligence as will ensure the Substantial and Final Completion of the Work by the dates specified in the Supplemental Conditions for Substantial and Final Completion or fails to complete the Work or remedy a default within said period;
- .2 If the Contractor is in material default in carrying out any provisions of the Contract;
- .3 If the Contractor fails to supply a sufficient number of properly skilled workers or proper equipment or materials;
- .4 If the Contractor fails to make prompt payment to Subcontractors or for materials or labor, unless he otherwise provides the Owner satisfactory evidence that payment is not legally due;
- .5 If the Contractor disregards laws, permits, ordinances, rules, regulations or orders of any public authority having jurisdiction, or fails to follow the instructions of the Owner;
- .6 If the Contractor substantially violates any provisions of the Contract Documents; or
- .7 If the Contractor refuses or fails to properly schedule, plan, coordinate and execute the Work, as specified herein, so as to perform the Work within the specified Completion Dates, or to provide scheduling or related information, revisions and updates as required by the Contract Documents.

14.3.2 The right of the Contractor to proceed shall not be so terminated under this Section 14.3 if the delays in the completion of the Work are due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor or his Subcontractors as specifically set forth in Section 8.3 hereof.

14.3.3 If, after the Contractor has been terminated for default pursuant to Section 14.3, it is determined that none of the circumstances set forth in Paragraph 14.3.1 exist, then such termination shall be

considered a termination for convenience pursuant to Section 14.2. In such case, the Contractor's sole remedy will be the costs permitted by Section 14.4.

- 14.3.4 If the Owner so terminates the employment of the Contractor due to the Contractor's default, the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the compensation to be paid to the Contractor hereunder shall exceed the expense of so completing the Work (including compensation for additional managerial, administrative, consultant and inspection services, attorney's fees and any damages for delay) such excess shall be paid to the Contractor.
- 14.3.5 If such expenses referenced in Paragraph 14.3.1, shall exceed the unpaid balance, the Contractor and his sureties shall be liable to the Owner for such excess. If the right of the Contractor to proceed with the Work is partially or fully terminated, the Owner may take possession of and utilize in completing the Work such materials, appliances, supplies, plant and equipment as may be on the site of the terminated portion of the Work and necessary for the completion of the Work. If the Owner does not fully terminate the right of the Contractor to proceed, the Contractor shall continue to perform the part of the Work that is not terminated.
- 14.3.6 If the Owner terminates the whole or any part of the Work pursuant to Section 14.3, the Owner may procure, upon such terms and in such manner as the Owner may deem appropriate, supplies or services similar to those so terminated, and the Contractor shall be liable to the Owner for any excess costs for such similar supplies or services. The Contractor shall continue the performance of the Contract to the extent not terminated hereunder.

14.4 ALLOWABLE TERMINATION COSTS

14.4.1 If the Owner terminates the whole or any portion of the Work pursuant to Section 14.2, then the Owner shall only be liable to the Contractor for those costs reimbursable to the Contractor in accordance with Paragraph 14.4.2, plus a markup of ten percent (10%) for profit and overhead on the actual fully accounted costs specified under Paragraph 14.4.2; provided however, that if there is evidence that the Contractor would have sustained a loss on the entire Contract had it been completed, no profit or overhead shall be included or allowed hereunder for the Work performed and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss. Under no circumstances shall the Contractor be entitled to any loss profit on the Work terminated pursuant to Section 14.2.

14.4.1.1 After receipt of a Notice of Termination, the Contractor shall submit to the Owner his termination Claim, in the form and with certification prescribed by the Owner. Such Claim shall be submitted promptly but in no event later than three (3) months from the effective date of termination, unless one or more extensions in writing are granted by the Owner upon request of the Contractor made in writing within such three (3) month period or authorized extension thereof. However, if the Owner determines that the facts justify such action, he may receive and evaluate any such termination Claim at any time after such three (3) month period or any extension thereof. Upon failure of the Contractor to submit his termination Claim within the time allowed, the Owner may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and such termination shall be final and binding on the Contractor.

14.4.2 If the Owner terminates the whole or any portion of the Work pursuant to Section 14.2, the Owner shall pay the Contractor an amount for supplies, services, or property accepted by the Owner, and which is in accordance with the Contract Documents, in an amount as if the Contract had not been terminated. In addition, in such event, the Owner shall pay to Contractor an

amount representing Contractor's actual cost, excluding any overhead and profit for the items and things specified in Subparagraph 14.5.1.6 and not heretofore paid for, appropriately adjusted for any saving of freight or other charges. Under no circumstances shall the Contractor be entitled to any loss profit on the Work terminated pursuant to Section 14.2.

14.4.2.1 The Contractor agrees that neither the Owner nor the Design Consultant will be liable for payments to Contractors or Subcontractors pursuant to Section 14.4.2 unless each contract and subcontract contains termination provisions identical to those set forth in this Article 14. The Owner and the Design Consultant will not be liable to the Contractor or any of the Subcontractors for any costs associated with termination if the contract or subcontract of the party involved does not include the required termination language.

14.4.3 In arriving at any amount due the Contractor pursuant to Section 14.4, there shall be deducted the following:

- .1 All unliquidated advance or other payments on account theretofore made to the Contractor applicable to the terminated portion of the Contract;
- .2 Any Claim which the Owner may have against the Contractor;
- .3 Such amount as the Owner determines to be necessary to protect the Owner against loss because of outstanding or potential liens or claims; and
- .4 The agreed price for, or the proceeds of sale of, any materials, supplies or other things acquired by the Contractor sold, pursuant to the provisions of Subparagraph 14.5.1.7, and not otherwise recovered by or credited to the Owner, or returned for a refund by the Contractor.
- .5 All other amounts the Owner is entitled to withhold from the Contractor or charge to the Contractor pursuant to the Contract or as allowed by applicable law.

14.4.4 The total sum to be paid to the Contractor under Section 14.4 shall not exceed the Contract Sum as reduced by the amount of payments otherwise made or to be made for Work not terminated and as otherwise permitted by the Contract. Except for normal spoilage, and except to the extent that the Owner shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor, as provided in Paragraph 14.4.2, the fair value, as determined by the Owner, of property which is destroyed, lost, stolen or damaged so as to become undeliverable to the Owner, or to a buyer pursuant to Subparagraph 14.5.1.7.

14.5 GENERAL TERMINATION PROVISIONS

14.5.1 After receipt of a Notice of termination from the Owner, pursuant to Section 14.2 or 14.3, and except as otherwise directed by the Owner, the Contractor shall:

- .1 Stop work under the Contract on the date and to the extent specified in the Notice of termination;
- .2 Place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the Work under the Contract as is not terminated;
- .3 Terminate all orders and subcontracts to the extent that they relate to the performance of

the Work terminated by the Notice of termination;

- .4 At the option of the Owner, and in lieu of terminating such orders and subcontracts, assign to the Owner in the manner, at the times and to the extent directed by the Owner in writing, all of the rights in the such orders and subcontracts,
- .5 Settle all outstanding liabilities and all Claims arising out of such termination or orders and subcontracts, with the approval or ratification of the Owner in writing, to the extent he may require, which approval or ratification shall be final for all the purposes of this Article;
- .6 Transfer title and deliver to the entity or entities designated by the Owner, in the manner, at the times and to the extent directed by the Owner to the extent specifically produced or specifically acquired by the Contractor for the performance of such portion of the Work as had been terminated, the following:
 - (1) The fabricated or unfabricated parts, Work in process, partially completed supplies and equipment, materials, parts, tools, dies, jigs and other fixtures, completed Work, supplies and other material produced as part of, or acquired in connection with the performance of, the Work terminated by the Notice of termination; and
 - (2) The completed or partially completed plans, drawings, information, releases, manuals and other property related to the Work and which, if the Contract had been completed, would have been required to be furnished to the Owner;
- .7 Use his best efforts to return for a refund or sell, in the manner, at the times, to the extent and at the price or prices directed or authorized by the Owner, any property of the types referred to in Subparagraph 14.5.1.6; provided, however, that the Contractor:
 - (1) Shall not be required to extend credit to any buyer, and
 - (2) May acquire any such property under the conditions prescribed by and at a price or prices approved by the Owner in writing; and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Owner to the Contractor under the Contract or shall otherwise be credited to the Contract Sum covered by the Contract or paid in such other manner as the Owner may direct;
- .8 Complete performance of such part of the Work as shall not have been terminated by the Notice of termination;
- .9 Take such action as may be necessary, or as the Owner may direct, for the protection and preservation of the property related to the Contract which is in the possession of the Contractor and in which the Owner has or may acquire an interest; and
- .10 Otherwise mitigate any damages Contractor claims to suffer as a result of a termination.

14.5.2 The Contractor shall, from the effective date of termination until the expiration of three (3) years after final settlement under the Contract, preserve and make available to the Owner, at all reasonable times at the office of the Contractor, but without direct charge to the Owner, all his books, records, documents and other evidence bearing on the costs and expenses of the Contractor under the Contract and relating to the Work terminated hereunder, or, to the extent approved by the Owner, photographs, micro-photographs or other authentic reproductions

thereof.

- 14.5.3 If the termination, pursuant to Section 14.2, be partial, the Contractor may file with the Owner a Claim for an equitable adjustment of the price or prices specified in the Contract relating to the continued portion of the Contract (the portion not terminated by the Notice of termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices. Any Claim by the Contractor for an equitable adjustment under this Paragraph must be asserted within thirty (30) days from the effective date of the Notice of termination.
- 14.5.4 The Contractor shall refund to the Owner any amounts paid by the Owner to the Contractor in excess of costs reimbursable under Section 14.4.
- 14.5.5 The Contractor shall be entitled to only those damages and that relief from termination by the Owner as specifically provided in Article 14.

ARTICLE 15

DISPUTE RESOLUTION

15.1 INITIATING CLAIMS

- 15.1.1 Claims must be initiated by written Notice to the Owner and to the party against whom the Claim is made with a copy to the Design Consultant. The responsibility to substantiate Claims shall rest with the party making the Claim.
- 15.1.2 Nothing in the Contract shall be construed as meaning that the Owner's assessment of Liquidated Damages is a Claim as defined herein, or that the Owner has the burden of proof to assess Liquidated Damages. Should the Owner assess Liquidated Damages, the burden of proving that such damages should not have been assessed shall rest upon the Contractor.

15.2 RESOLUTION OF CLAIMS AND DISPUTES BETWEEN CONTRACTOR AND OWNER

- 15.2.1 Claims by Contractor against Owner and by Owner against Contractor, including those alleging an error or omission by the Design Consultant shall be subject to the process set forth in this Section 15.2. Such Claims shall be referred initially to the Design Consultant for a decision. A final decision by the Design Consultant, or the failure of the Design Consultant to issue a final decision shall be required as a condition precedent to mediation or litigation of all such Claims arising prior to the date final payment is due. The Design Consultant will initially decide disputes between Owner and Contractor.
- 15.2.2 The Design Consultant will review Claims by Contractor and Owner against each other and within twenty (20) days of the receipt of the written Claim and take one or more of the following actions:
- .1 Request additional supporting data from the claimant or a response with supporting data from the other party;
 - .2 Reject the Claim in whole or in part;
 - .3 Approve the Claim;
 - .4 Suggest a compromise; or

- .5 Advise the parties that the Design Consultant is unable to resolve the Claim if the Design Consultant lacks sufficient information to evaluate the merits of the Claim or if the Design Consultant concludes that it would be inappropriate for the Design Consultant to resolve the Claim.
- 15.2.3 In evaluating Claims made under this Section 15.2, the Design Consultant may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who assist the Design Consultant in rendering a decision.
- 15.2.4 If the Design Consultant requests a party to provide a response to a Claim under this Section 15.2, or to furnish additional supporting data, such party shall respond, within ten (10) days after receipt of such request, and shall within such time period, either provide a response to the requested supporting data, advise the Design Consultant when the response or supporting data will be furnished, or advise the Design Consultant that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Design Consultant will either reject or approve the Claim in whole or in part.
- 15.2.5 The Design Consultant will approve or reject Claims under this Section 15.2 by written decision, which shall state the reason thereof and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Design Consultant under this Section 15.2 shall be final and binding on the parties but subject to mediation and litigation.
- 15.2.6 When a written decision of the Design Consultant under this Section 15.2 states that the decision is final but subject to mediation, then a demand for mediation of a Claim covered by such decision must be made within thirty (30) days after the date on which the party making the demand receives the final written decision. Any failure to demand mediation within said thirty (30) days' period shall result in the Design Consultant's decision becoming final and binding to all parties. Claims not resolved in mediation shall be subject to litigation if in accordance with the applicable statutes of limitation and repose.
- 15.2.7 Upon receipt of a Claim under Section 15.2 against the Contractor or at any time thereafter, the Design Consultant or the Owner may, but is not obligated to, notify the Surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Design Consultant or the Owner may, but are not obligated to, notify the Surety and request the Surety's assistance in resolving the controversy.
- 15.2.8 If the Design Consultant deems that a Claim under this Section 15.2 is valid, the Design Consultant shall require all parties to the dispute to share the cost of the Design Consultant's review equitably. If the Design Consultant deems that a Claim under this Section 15.2 is invalid, the Design Consultant shall require the complaining party to bear the cost of the Design Consultant's review. In any event, the Design Consultant may require the complaining party to submit a deposit equivalent to the Design Consultant's hourly rate multiplied by the amount of time the Design Consultant estimates, in the Design Consultant sole discretion, that will be necessary to review the Claim. The Design Consultant shall return any unused portion of this initial deposit to the complaining party following the Design Consultant's completion of the Design Consultant's review of the Claim. Nothing in these procedures shall entitle the Design Consultant to compensation for additional services from the Owner that is not authorized pursuant to the terms and conditions of the Agreement for Design Consultant Services.

15.3 TIME LIMITS ON CLAIMS

15.3.1 Unless a shorter time is provided in the Contract Documents, Claims by Contractor or any party except Owner must be initiated within twenty (20) days after occurrence of the event giving rise to such Claim or within twenty (20) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims against the Owner shall be initiated in strict conformance with the Contract Documents. Nothing in these procedures shall extend the period within or the manner in which Claims against the Owner must be submitted. Claims must be initiated by written Notice to the Owner and written notice to the other party and to the Design Consultant. Any Claim against the Owner that is not initiated within the applicable time period is waived. Claims by Owner may be made at any time within the applicable statute of limitations and repose.

15.4 CONTINUING CONTRACT PERFORMANCE

15.4.1 Pending final resolution of a Claim, the Contractor shall proceed diligently with the performance of the Contract, unless instructed otherwise in writing by the Owner.

15.5 MEDIATION

15.5.1 As required by N.C.G.S 143-128 (f1), any Claim as defined herein, which exceeds fifteen thousand dollars(\$15,000.00), and which concerns a party involved in the Project, including the Owner, Contractor, Design Consultant, any construction manager, separate contractors, or first and lower tier Subcontractors and which arise out of the Contract or the construction process, except those waived Claims shall, be subject to mediation as a condition precedent to the institution of legal proceedings by any party, except that any party may institute legal proceedings or perfect any mechanic's or materialmen's lien in order to meet any applicable statute of limitations or similar deadline prior to engaging in mediation.

15.5.2 The parties shall endeavor to resolve their Claims under this Section 15.5 by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the rules established by the Owner.

15.5.3 The parties shall share cost of the mediation equally except that if the Owner is a party to the dispute, the Owner shall pay at least one third of the cost of the mediation.

15.5.4 The mediation shall be held in a place where the Project is located, unless another location is mutually agreed upon.

15.5.5 Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

15.5.6 The Owner's Dispute Resolution Policy required by N.C.G.S. § 143-128(f1) is contained in Policy 9030 (www.dpsnc.net). The Dispute Resolution Policy is also included in the bid and contract documents.

END OF GENERAL CONDITIONS

SUMMARY OF WORK

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Project is: DPS Lakeview School Controls Replacement
 - 1. Project Location: 3507 Dearborn Dr, Durham, NC 27704
 - 2. Owner: Durham Public Schools
- B. Contract Documents, dated **March 24, 2023**, were prepared for the project by **Dewberry Engineers Inc, 2610 Wycliff Road, Suite 410, Raleigh, NC 27607**.
- C. The Work generally includes: The scope of this project is to replace existing system controllers, sensors, enclosures, and field devices. Existing actuators and frees tats are intended to remain. Any found not functional during checkout are to be captured on a deficiency report and replaced as needed. Project has Federal funding.

1.3 CONTRACTOR USE OF PREMISES

- A. Refer to Special Project Procedures Section 01 35 13 and Work Restrictions 01 14 00.

1.4 OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate owner usage. Perform the Work so as not to interfere with the Owner's operations.

1.5 MISCELLANEOUS PROVISIONS

- A. Owner will remove existing furniture

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 11 00

Section 01 11 00

WORK RESTRICTIONS Section 01 14 00

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, general provisions of the Contract, including General Conditions, other Division 1 Specification Sections, and all other contract bid documents apply to this Section.

1.2 USE OF PREMISES

- A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
 - 1. Limits: Confine constructions operations to comply with Durham Public Schools security badge system.
 - 2. Durham Public Schools Occupancy: Allow for Durham Public Schools occupancy of site according to the Project Plan.
 - 3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Durham Public Schools, Durham Public Schools employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.3 SUMMARY

- A. This Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.
- B. Specific requirements of each contract are also indicated in individual Specification Sections, All Bid Documents and on Drawings.

1.4 OCCUPANCY REQUIREMENTS

- A. Full Durham Public Schools Occupancy: Durham Public Schools will occupy site and existing building during entire construction period. Cooperate with Durham Public Schools during construction operations to minimize conflicts and facilitate Durham Public Schools usage. Perform the Work so as not to interfere with Durham Public Schools' operations.
- B. Partial Durham Public Schools Occupancy: Durham Public Schools reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

WORK RESTRICTIONS Section 01 14 00

1.5 SPECIAL REQUIREMENTS

- A. Prime and subcontractors are required to comply with Article 2 of Chapter 64 of the North Carolina General Statutes, including but not limited to, the use of E-Verify to verify the legal employment status of its employees.

Each prime and subcontractor shall sign and return their Affidavit of E-Verification to Durham Public Schools at the time they return their contract.

If at any time during the project additional workers are hired by the prime or subcontractor, the prime or subcontractor shall notify Durham Public Schools, sign and return an Affidavit of E-Verification prior to the new hire beginning work on the project.

If at any time during the project additional prime or subcontractors are added to the project, Durham Public Schools shall be notified, and the new prime or subcontractor shall sign and return an Affidavit of E-Verification prior to commencing work on the project.

- B. Criminal Background Investigations of individuals working on school property (sites occupied with students and sites not occupied with students).
- C. At a minimum, the contractor shall obtain a complete North Carolina statewide criminal background investigation for all employees and subcontractors who will work on this project, covering a period for the last seven (7) years. In the event that the contractor or subcontractor is from out of state, the criminal background investigation shall be broadened to include their home state, as well as the state of North Carolina as outlined above. The company providing such information must be recognized by local law enforcement agency as qualified to do so. All costs associated with these criminal background checks is the responsibility of the contractor.

Each prime contractor will be responsible for all their employees and all of their subcontractors working under them.

On sites that are occupied with students and staff, a daily sign-in sheet will be presented by each prime contractor to the principal and SRO – Student Resource Officer by 9:00 a.m. each morning. If there is no SRO – provide to the Principal. This list will contain the name of each person on site and the company they work for.

On sites that are new or unoccupied by students and staff – each prime contractor will provide the daily sign-in sheet to the Owner’s Rep who will be designated by the Owner at the Pre-Construction Meeting.

The daily sign in log will be made available to the successful prime contractors at the Pre-Construction Meeting.

- D. Any individual with the following criminal convictions or pending charges will **NOT** be permitted on any school project or property.
 - Child molestation or abuse;
 - 1. Child molestation or abuse;
 - 2. Child pornography;
 - 3. Repeated domestic violence charges or convictions;

WORK RESTRICTIONS Section 01 14 00

4. Rape or felony sexual assault;
 5. Any sexually oriented crime;
 6. Drugs: Felony use, possession or distribution within the last 10 years;
 7. Carjacking or automotive theft;
 8. Felonies involving firearms or other deadly weapons;
 9. Felony arson or destruction of property;
 10. Felony theft, burglary, home invasion or robbery;
 11. Felony racketeering or extortion;
 12. Felony kidnapping;
 13. Felony assault, battery, homicide, murder, attempted murder or other violent felony; or Hate crimes.
- E. Any individual with a prior conviction or pending charges contained in the aforementioned list, shall be banned (not allowed) from any school project or property.
- F. Each person on site must wear a plastic laminated identification badge that identifies the name of the company and the person's name. These badges are to be computer produced at a font large enough to be clearly visible. All costs associated with these criminal background checks is the responsibility of the contractor. The ID badge template will be made available to the successful prime contractors at the Pre-Construction Meeting.
- G. Durham Public Schools, may, at any time, request verification of criminal background investigation for any employee or subcontractor on school property.
- H. There is a NO TOBACCO policy on all property owned by Durham Public Schools. Therefore, use of any type of tobacco product is prohibited. Workers will be asked to leave the site for the balance of the day on their first offense. Workers will be asked to permanently leave the site after the first offense.
- I. If, in the opinion of the Architect, the General Contractor does not properly water tight the building from the elements – the Owner maintains the right to call in a 3rd party Industrial Hygienist for the purpose of evaluating the infiltration of moisture. This Industrial Hygienist will prepare a report of corrective action necessary to prevent future mold and mildew issues and the General Contractor is solely responsible for the corrective action necessary, as well as all costs associated with the services of the Industrial Hygienist and any additional surface or air quality testing fees that may be required to insure a safe building. No finishes, including drywall work are to commence until the building is permanently enclosed.
- J. All contractors understand and agree that the primary use of an occupied school facility is for the instructional programming to benefit the achievement of the students enrolled in said facility. During periods of standardized and other major testing such as EOG's, etc.. the contractors agree to pursue quiet operations that do not disturb the testing operations. No claims for delay will be considered for these days of quiet operation during periods of testing.
- K. In the event the contractor fails to meet their schedule and this failure to meet the scheduled completion dates affect the delivery of Owner furnished furniture and / or equipment – the Owner has the right (at the sole expense of the contractor) to procure the services of security guards to protect furniture and / or equipment that has been delivered to the project until such time as contractor has met the requirements for the Owner's permanent occupancy of the building

WORK RESTRICTIONS Section 01 14 00

(Substantial Completion). The Contractor further agrees that they will pay for all handling, shipping and storage costs associated with the storage of furniture and equipment that cannot be delivered and placed in the building due to the Contractor's failure to meet the scheduled completion dates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 14 00

ALTERNATES Section 01 23 00

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, general provisions of the Contract, including General Conditions, other Division 1 Specification Sections, and all other contract bid documents apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.
- B. Specific requirements of each contract are also indicated in individual Specification Sections, All Bid Documents and on Drawings.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Prior to award of the Contract, the Architect will notify each party involved, in writing, of the status of each alternate. The Architect will indicate if alternates have been accepted, rejected, or deferred for later consideration. The Contractor agrees to honor pricing on Bid Alternates for a period of 120 calendar days.
- C. Execute accepted alternates under the same conditions as other work of the Contract.

ALTERNATES Section 01 23 00

- D. Schedule: A Schedule of Alternates is included at the end of this Section. The Bid Documents contain technical requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate #1: Manufacturer Preferred Brand of Building Automation System: Distech.

END OF SECTION 01 23 00

ALTERNATES

SUBSTITUTIONS PROCEDURES

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."
- C. Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- D. Procedural requirements governing the Contractor's selection of products and product options are included under Section "Materials and Equipment."

.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:
 - 1. Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to Contract Documents requested by the Owner or Program Manager.
 - 3. Specified options of products and construction methods included in Contract Documents.
 - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

.4 SUBMITTALS

- A. Substitution Request Submittal: Requests for substitution will be considered if received within 30 days after commencement of the Work. Requests received more than 30 days after commencement of the Work may be considered or rejected at the discretion of the Program Manager.

SUBSTITUTIONS PROCEDURES

1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - c. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
 - d. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - e. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - f. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
3. Program Manager 's Action: Within one week of receipt of the request for substitution, the Program Manager will request additional information or documentation necessary for evaluation of the request. Within 2 weeks of receipt of the request, or one week of receipt of the additional information or documentation, whichever is later, the Program Manager will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order.

PART 2 - PRODUCTS

.1 SUBSTITUTIONS

- A. Conditions: The Contractor's substitution request will be received and considered by the Program Manager when one or more of the following conditions are satisfied, as determined by the Program Manager; otherwise requests will be returned without action except to record noncompliance with these requirements.
 1. Extensive revisions to Contract Documents are not required.
 2. Proposed changes are in keeping with the general intent of Contract Documents.
 3. The request is timely, fully documented and properly submitted.
 4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.

SUBSTITUTIONS PROCEDURES

5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Program Manager for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
 9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.
- B. The Contractor's submittal and Program Manager 's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 25 00

MODIFICATION PROCEDURES

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing contract modifications.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Submittals" for requirements for the Contractor's Construction Schedule.
 - 2. Division 1 Section "Applications for Payment" for administrative procedures governing Applications for Payment.
 - 3. Division 1 Section "Product Substitutions" for administrative procedures for handling requests for substitutions made after award of the Contract.

.3 MINOR CHANGES IN THE WORK

- A. The **Program Manager** will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time.

.4 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: The **Program Manager** will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal requests issued by the **Program Manager** are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
 - 2. Within 10 days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the **Program Manager** for the Owner's review.
 - a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.

MODIFICATION PROCEDURES

- B. Contractor-Initiated Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Program Manager.
1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 2. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Comply with requirements in Section "Product Substitutions" if the proposed change requires substitution of one product or system for a product or system specified.
- C. Proposal Request Form: Use **Change Order Proposal Form** for Change Order Proposal Requests.
1. Include sufficient documentation of quantities and unit prices to allow evaluation of quantities with respect to the work required and the intent of the change. Require subcontractors to provide comparable documentation for their work.
 2. Do not use lump sum pricing for any trade or subcontract in excess of \$500.00.
 3. Permit charge for overhead and profit determined as follows:
 - a. for the Contractor, for any work performed by his employees or agents 10% of the costs. Deduct 5% for deductive change orders;
 - b. for the Contractor, for work performed by his Subcontractor, 5% of the amount due the subcontractor; and
 - c. for each Subcontractor, for work performed by such Subcontractor, his employees and agents, 10% of the costs.
 - d. "Costs" shall not include home-office charge or expenses, supervisions, superintendents, wages of time keepers, watchmen and clerks, small tools, incidentals, general office expense and all other expenses generally constituting overhead or general conditions. The proposals from the contractor for extra work shall include a breakdown showing cost for materials, labor, insurance and overhead and profit and bonds.
 4. The maximum total combined markup for bonds and insurance will be two (2) percent of the total amount.

.5 ALLOWANCES

- A. Allowance Adjustment: For allowance-cost adjustment, base each Change Order Proposal on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place. Where applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
1. Include installation costs in the purchase amount only where indicated as part of the allowance.
 2. When requested, prepare explanations and documentation to substantiate the margins claimed.
 3. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or the Contractor's handling, labor

MODIFICATION PROCEDURES

, installation, overhead, and profit. Submit claims within 21 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. The Owner will reject claims submitted later than 21 days.

1. Do not include the Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in Contract Documents.
2. No change to the Contractor's indirect expense is permitted for selection of higher or lower-priced materials or systems of the same scope and nature as originally indicated.

.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the **Program Manager** may issue a Construction Change Directive. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. The Construction Change Directive contains a complete description of the change in the Work. It also designates the method to be followed to determine change in the Contract Sum or Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

.7 CHANGE ORDER PROCEDURES

- A. Upon the Owner's approval of a Proposal Request, the Program Manager will issue a Change Order for signatures of the Owner and the Contractor.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 26 00

Request for Information

Date: _____

Durham Public Schools
Lakeview School Controls Replacement
3507 Dearborn Dr, Durham, NC 27704

To: Dewberry Engineers Inc.
2610 Wycliff Road, Suite 410
Raleigh, NC 27607
Attn: Bill Hamilton, PE
whamilton@dewberry.com

RFI Number: _____

In reference to the above listed project, we are hereby requesting a clarification, determination and/or information concerning the following:

Section Number: _____ Drawing Number: _____

Requested By: _____ Date of Request: _____

Title: _____ Date Reply Required: _____

In reply to your request, be advised: _____

Reply By: _____ Date of Reply: _____

Title: _____ Date Reply Returned: _____

PAYMENT PROCEDURES

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Schedules: The Contractor's Construction Schedule and Submittal Schedule are specified in Division 1 Section "Submittals."

.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
 - a. Contractor's Construction Schedule.
 - b. Application for Payment forms, including Continuation Sheets.
 - c. Schedule of allowances.
 - d. List of products.
 - e. List of principal suppliers and fabricators.
 - f. Schedule of submittals.
 - 2. Submit the Schedule of Values to the **Program Manager** at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Applications for Payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.

PAYMENT PROCEDURES

- b. Name of the **Engineer**.
 - c. Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - 1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.
4. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.
6. **Provide a separate line item in the Schedule of Values for each of the following items with the corresponding values and dollar amounts:**
 - **As-Built Drawing Documents** **1/2 % of total contract value**
 - **O & M Manuals** **1/2 % of total contract value**
 - **Warranty Binders** **1 % of total contract value**
7. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.

PAYMENT PROCEDURES

9. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the **Program Manager** and paid for by the Owner.
 1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
- B. Payment-Application Times: The date for each progress payment application is the seventh day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 7 days prior to the date for each progress payment.
- C. Payment-Application Forms: Use AIA Document G702 and Continuation Sheets G703 as the form for Applications for Payment. Use the Sales Tax form to report applicable state and county sales taxes. Include a completed Payment Application Cover Sheet with each application.
- D. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The **Program Manager** will return incomplete applications without action.
 1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
- E. Sales Tax Summary – The project is subject to a sales tax rebate for the Owner. Each contractor and subcontractor shall submit a summary of payments made and invoices received including sales taxes for the month being billed. Each contractor shall maintain these accounts on the form included in this project manual entitled Certificate Concerning North Carolina State and County Sales Tax (hereinafter referred to as the “Sales Tax Form”. All supporting documentation is required on a monthly basis along with the payment application. Supporting documentation is identified on the form. When the Contractor submits multiple Sales Tax Forms, he shall also provide a notarized summary form that lists each Subcontractor and the taxes reported by that subcontractor. A total for each column shall be computed and reported on this summary sheet. This summary sheet shall be the first sheet of the sales tax reports submitted.
- F. Transmittal: Submit two (2) signed and notarized original copies of each Application for Payment (including separately notarized sales tax reports) to the **Program Manager** by a method ensuring receipt within 24 hours. Both copies shall be complete, including waivers of lien and similar attachments, when required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Program Manager.

PAYMENT PROCEDURES

- G. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics liens from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.
2. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item. Retainage is to be calculated at a rate of 5% and will be withheld in accordance with the requirements set forth in the N.C. General Statutes
 3. When an application shows completion of an item, submit final or full waivers.
 4. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
 5. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.
- H. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:
1. List of subcontractors.
 2. List of principal suppliers and fabricators.
 3. Schedule of Values.
 4. Contractor's Construction Schedule (preliminary if not final).
 5. Schedule of principal products.
 6. Submittal Schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from governing authorities for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction meeting.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Data needed to acquire the Owner's insurance.
 16. Initial settlement survey and damage report, if required.
 17. Completed Payment Application coversheet, and all items itemize thereon.
- I. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Test/adjust/balance records.
 - d. Maintenance instructions.
 - e. Startup performance reports.

PAYMENT PROCEDURES

- f. Final cleaning.
 - g. Application for reduction of retainage and consent of surety.
 - h. Advice on shifting insurance coverages.
 - i. Final progress photographs.
 - j. List of incomplete Work, recognized as exceptions to **Program Manager's** Certificate of Substantial Completion.
- J. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
- 1. Completion of Project closeout requirements.
 - 2. Completion of items specified for completion after Substantial Completion.
 - 3. Ensure that unsettled claims will be settled.
 - 4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
 - 5. Transmittal of required Project construction records to the Owner.
 - 6. Proof that taxes, fees, and similar obligations were paid.
 - 7. Removal of temporary facilities and services.
 - 8. Removal of surplus materials, rubbish, and similar elements.
 - 9. Submit Appendix E MBE Documentation for Contract Payments as documentation of payment to minority businesses for work on the Project.
 - 10. Submit Lien Waivers from subcontractors and major equipment suppliers.
 - 11. Submit Affidavit of Payment of Debts and Claims with all supporting documentation.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 62 76

PROJECT MANAGEMENT & COORDINATION

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, general provisions of the Contract, including General Conditions, other Division 1 Specification Sections, and all other contract bid documents apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on the Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Conservation.
 - 3. Coordination Drawings.
 - 4. Administrative and supervisory personnel.
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Specific requirements of each contract are also indicated in individual Specification Sections, All Bid Documents and on Drawings.

1.3 COORDINATION

- A. Coordination: The General Contractor shall coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. The GC shall coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation. The GC shall be the Project Expediter and Project Coordinator on this project.
 - 1. The GC shall schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary, all Prime Contractors shall prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

PROJECT MANAGEMENT & COORDINATION

1. Prepare similar memoranda for architect, Owner, Owner's rep & Program / Construction Manager and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: The GC shall coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following: It is the responsibility of all Prime Contractors to coordinate with GC in the preparation of all scheduling and coordination issues.
1. Preparation of Contractor's Construction Schedule.
 2. Preparation of the Schedule of Values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.

1.4 SUBMITTALS

- E. Coordination Drawings: The General Contractor is responsible for coordination / preparation of Mechanical – Plumbing – Electrical - Technology Coordination Drawings for optimum utilization of space for efficient installation of different components and for the coordination for installation of products and materials fabricated by separate entities.
- F. Coordination drawings are to be complete and signed off by all prime contractors or major subs (plumbing, mechanical, electrical & technology) within 60 days of the Notice to Proceed.
1. Indicate relationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.
 3. Refer to Division 15 and Division 16 for specific Coordination Drawing requirements for mechanical and electrical installations.
 4. Preliminary coordination drawings must be submitted to the architect, Owner, Owner's rep & Program / Construction Manager prior to the initial pay application being paid.
- G. Staff Names: Within 5 working days of starting construction operations, all Prime Contractors will submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers.
- H. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

PROJECT MANAGEMENT & COORDINATION

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- I. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
 1. Include special personnel required for coordination of operations with other contractors.

1.6 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify architect, Owner, Owner's rep & Program / Construction Manager, of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees at least 3 days prior to the scheduled meeting..
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including, architect, Owner, Owner's rep & Program / Construction Manager within 2 days of the meeting.
- J. Preconstruction Conference: The architect will schedule a pre-construction conference, at a time convenient to contractors, architect, Owner, Owner's rep & Program / Construction Manager, but no later than 10 days after notice to proceed. The conference will be at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
 1. Attendees: Authorized representatives of architect, Owner, Owner's rep & Program / Construction Manager, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing.
 - d. Designation of responsible personnel.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for processing Applications for Payment.
 - g. Distribution of the Contract Documents.
 - h. Submittal procedures.
 - i. Preparation of Record Documents.

PROJECT MANAGEMENT & COORDINATION

- j. Use of the premises.
 - k. Responsibility for temporary facilities and controls.
 - l. Parking availability.
 - m. Office, work, and storage areas.
 - n. Equipment deliveries and priorities.
 - o. First aid.
 - p. Security.
 - q. Progress cleaning.
 - r. Working hours.
- K. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction. These Pre-Installation meetings shall include all work scopes / trades as directed by architect, Owner, Owner's rep & Program / Construction Manager.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise architect, Owner, Owner's rep & Program / Construction Manager of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related Change Orders.
 - d. Purchases.
 - e. Deliveries.
 - f. Submittals.
 - g. Review of mockups.
 - h. Possible conflicts.
 - i. Compatibility problems.
 - j. Time schedules.
 - k. Weather limitations.
 - l. Manufacturer's written recommendations.
 - m. Warranty requirements.
 - n. Compatibility of materials.
 - o. Acceptability of substrates.
 - p. Temporary facilities and controls.
 - q. Space and access limitations.
 - r. Regulations of authorities having jurisdiction.
 - s. Testing and inspecting requirements.
 - t. Required performance results.
 - u. Protection of construction and personnel.
 - v. Review of the "Project Plan".
 - 3. Record significant conference discussions, agreements, and disagreements.
 - 4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

PROJECT MANAGEMENT & COORDINATION

- L. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.
 - 1. Attendees: In addition to architect, Owner, Owner's rep & Program / Construction Manager, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work within 24 hours of notification of an issue needing action by one or more parties.
 - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time. (See Section 01311 for specific scheduling requirements).
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
 - 14) Documentation of information for payment requests.
 - 3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- M. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.

PROJECT MANAGEMENT & COORDINATION

1. Attendees: In addition to architect, Owner, Owner's rep & Program / Construction Manager each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
3. Reporting: General Contractor to record meeting results and distribute copies within 2 working days to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01 31 00

CONSTRUCTION PROGRESS DOCUMENTATION

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Schedule.
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Material location reports.
 - 5. Field condition reports.
 - 6. Special reports.
 - 7. Construction photographs.
- B. Specific requirements of each contract are also indicated in individual Specification Sections, All Bid Documents and on Drawings.
- C. Construction Photographs: Submit two prints of each photographic view (4 views total) within five working days of taking photographs, must be submitted with each monthly pay application.
 - 1. Format: Digitally formatted in a manner acceptable to the architect, Owner, Owner's rep & Program / Construction Manager, and provided electronically.
 - 2. Identification: On each print, provide an electronically applied label with the following information:
 - a. Name of Project.
 - b. Name and address of photographer.
 - c. Name of Architect and Owner.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - 3. Negatives: Submit a complete set of photographic negatives or diskette containing electronic image file in protective envelopes with each submittal of prints. Identify date photographs were taken.

CONSTRUCTION PROGRESS DOCUMENTATION

- D. Daily Construction Reports: Submitted Daily to architect, Owner, Owner's rep & Program / Construction Manager in a format as defined by Owner (including electronic formats such as Primavera Expedition).
- E. Material Location Reports: Submit as required by architect, Owner, Owner's rep & Program / Construction Manager.
- F. Field Condition Reports: Submitted to architect, Owner, Owner's rep & Program / Construction Manager in a format as defined by architect, Owner, Owner's rep & Program / Construction Manager (including electronic formats such as Primavera Expedition).
- G. Special Reports: Submitted per occurrence to Architect and Owner's Representative in a format as defined by architect, Owner, Owner's rep & Program / Construction Manager (including electronic formats such as Primavera Expedition).

1.3 QUALITY ASSURANCE

- 1. Photographer Qualifications: Digital photos of high quality taken by the General Contractor are acceptable.

1.4 COORDINATION

- A. Auxiliary Services: Cooperate with other trades, architect, Owner, Owner's rep & Program / Construction Manager, and provide auxiliary services requested, including access to Project site and use of temporary facilities including temporary lighting.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Initial Submittal: Submit concurrently with preliminary network diagram. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead-time for manufacture or fabrication.
 - a. Show submittals on the Preliminary Construction Schedule.

CONSTRUCTION PROGRESS DOCUMENTATION

- b. Submittals must be logged and maintained in a format as defined by architect, Owner, Owner's rep & Program / Construction Manager, (including electronic formats such as Primavera Expedition).

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work by Durham Public Schools: Include a separate activity for each portion of the Work performed by Durham Public Schools.
4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date. Delivery dates indicated stipulate the earliest possible delivery date.
5. Durham Public Schools -Furnished Products: Include a separate activity for each product. Include delivery date. Delivery dates indicated stipulate the earliest possible delivery date.
6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion. (Show staff occupying the building to set up classes & stocking at least 30 days prior to the contract substantial completion date).
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
8. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

CONSTRUCTION PROGRESS DOCUMENTATION

- a. Structural completion.
 - b. Permanent space enclosure.
 - c. Completion of mechanical installation.
 - d. Completion of electrical installation.
 - e. Substantial Completion.
9. Responsibilities: Identify each activity according to the responsibility for that activity. Responsibilities categorization of activities shall include
- a. Durham Public Schools
 - b. Architect
 - c. City or County Agency having jurisdiction
 - d. General Contractor
 - e. Mechanical Contractor
 - f. Plumbing Contractor
 - g. HVAC Contractor
 - h. Electrical Contractor
 - i. Technology Contractor
 - j. Others having prime contracts

The purpose of this responsibility is to sort the schedule by entities having prime agreements with Durham Public Schools, Architect, agencies having jurisdiction. Establish secondary responsibilities in a separate activity definition for the purposes of sorting by subcontractors for the contractor's convenience.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. High and low temperatures and general weather conditions.
 5. Accidents.
 6. Meetings and significant decisions.
 7. Unusual events (refer to special reports).
 8. Stoppages, delays, shortages, and losses.
 9. Meter readings and similar recordings.
 10. Emergency procedures.
 11. Orders and requests of authorities having jurisdiction.
 12. Change Orders received and implemented.
 13. Construction Change Directives received.
 14. Services connected and disconnected.
 15. Equipment or system tests and startups.

CONSTRUCTION PROGRESS DOCUMENTATION

- 16. Partial Completions and occupancies.
- 17. Substantial Completions authorized.

- B. Material Location Reports: At intervals as required by the architect, Owner, Owner's rep & Program / Construction Manager, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information on Primavera Expedition. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

- A. General: Submit special reports directly to architect, Owner, Owner's rep & Program / Construction Manager, within one day of an occurrence. Distribute copies of report to parties affected by the occurrence by way of Primavera Expedition.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, and response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise architect, Owner, Owner's rep & Program / Construction Manager, in advance when these events are known or predictable.

END OF SECTION 01 32 00

CONSTRUCTION SCHEDULES & REPORTS

DPS Lakeview School Controls Replacement

1.01 GENERAL REQUIREMENTS

- A. The work under this contract shall be planned, scheduled, executed, and reported using the Critical Path Method (hereinafter referred to as: CPM), pursuant to the provisions of the General Conditions. Any deviation between this scheduling specification and the General Conditions shall be governed by the more stringent spec at the full discretion of the Engineer, Owner, Owner's rep & Program / Construction Manager.
- B. The primary objectives of the project scheduling program are to insure the adequate planning, scheduling and execution of the construction activities so they may be prosecuted in an orderly and expeditious manner, within the Contract Time and the milestones stipulated by the Contract, to provide optimum coordination between contractors, to establish the basis for measuring and monitoring individual contractor progress and overall project progress, to detect problems for the purpose of taking corrective action to maintain the scheduled program and to provide a mechanism or tool for determining and monitoring such corrective actions.
- C. Any schedule templates prepared for this project by the owner are made available by the Owner solely as an aid to the Contractor. Any construction plan depicted in the schedule template may not optimize, and it is not intended to optimize, the Bidder's costs or resources. It is intended that these schedules will reflect the milestones and completion dates established by the Owner. However, the services provided by the Engineer, Owner, Owner's rep & Program / Construction Manager, the existence of schedules, networks, or any other charts or services prepared or performed by the Engineer, Owner, Owner's rep & Program / Construction Manager shall in no way relieve the Contractor and/or Project Expediter of the responsibility of complying with all of the requirements of the Contract Documents, including but not limited to the responsibility of completing the Work within the Contract Time and the responsibility of planning, scheduling and coordinating the work. The Contractor is required to comply with all control procedures specified herein and with any reasonable changes that may be necessary, in the opinion of the Engineer, Owner, Owner's rep & Program / Construction Manager, or that are provided to the contractor regarding key dates, during the contract duration.
- D. Any and all milestone or specific Dates listed in these specifications, or elsewhere in the Contract Documents, represent only the major items of construction/erection work or interface dates. The milestone completion dates indicated are considered essential to the satisfactory performance of this Contract and to the coordination of all work on the project.

The milestone dates listed are not intended to be a complete listing of all work under this Contract or of all interfaces with other project contractors.

The milestone dates listed represent the latest allowable completion dates. Earlier completion dates may be established by the Project Expediter as agreed by the Contractor(s), Engineer, Owner, Owner's rep & / or Program / Construction Manager.

- E. If the Contractor should desire or intend to complete the work earlier than any required Milestone or Completion date, the Engineer, Owner, Owner's rep & Program /

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Construction Manager shall not be liable to the Contractor for any costs or other damages should the contractor be unable to complete the Work before such Milestone or Completion date. The duties, obligations, and warranties of the Owner to the Contractor shall be consistent with and applicable only to the completion of the Work on the Milestone and completion dates required in the Owner-Contractor Agreement, unless the Owner and Contractor otherwise agree in writing.

F. THE GENERAL CONSTRUCTION CONTRACTOR IS THE PROJECT EXPEDITER / COORDINATOR AND HAS THE DUTY OF SCHEDULE PREPARATION, COORDINATION, UPDATING & REPORTING.

1.02 PRE-BID

A. The Owner reserves the right to the following prior to the receipt of bids:

1. Engineer, Owner, Owner's rep & Program / Construction Manager or a third-party scheduling consultant may prepare a Preliminary Provisional Network, which displays a construction plan to complete the Project in compliance with Specific Dates listed in the Bid Documents.
 - a. The Engineer, Owner, Owner's rep & Program / Construction Manager make no warranty or representation either express or implied, as to the reasonableness of or feasibility of the fact that this Preliminary Provisional Network may be a complete listing of all of the Work activities required by this Contract.
 - b. Each Bidder is under the obligation of reviewing and analyzing the Preliminary Provisional Network and determining its feasibility and reasonableness with regard to the activities required by the Contract Documents, the duration of such activities and the sequence of work required in order to complete the work within the contract time.
2. At the sole discretion of the Owner the Engineer, Owner, Owner's rep & Program / Construction Manager may conduct a Pre-Bid Conference to familiarize bidders with the Project and the Preliminary Provisional Network, if supplied.

1.03 POST AWARD ACTIVITIES

A. The Contractor shall perform the following after receipt of the Notice to Proceed.:

Immediately following the receipt of Notice to Proceed, the General Contractor shall commence the preparation of the Detailed Construction Schedule. In this respect and prior to the next meeting with the Engineer, Owner, Owner's rep & Program / Construction Manager, the Contractor shall assemble, with the assistance of his Subcontractors and Suppliers, information regarding the project that includes but is not limited to:

1. A Detailed Construction Schedule that represents the Contractor's best judgment in how he shall prosecute and complete the work in compliance with the Contract Milestone Dates and any Specific Dates stipulated in the General Conditions or other contract documents.

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2. The identity and duration of all activities to be included in this construction plan shall meet the following criteria:
 - (A) Activity descriptions shall be clear and concise. The beginning and end of each activity shall be readily verifiable.
 - (B) Responsibility for each activity shall be identified with a single performing organization. (i.e., Primes, suppliers, vendors, and all sub-contractor)
 - (C) The cost component for each activity shall be provided, if requested by the Owner. The sum of the activity cost components shall equal the contract price.
 - (D) An activity must be no more than 14 calendar days in duration unless approved in advance by the Engineer, Owner, Owner's rep & Program / Construction Manager.
 - (E) Include relevant predecessors and successors for each activity as well as the type of relationships between, and any lag time required. All activities except the first activity (i.e., NTP) and last activity (i.e., Final Completion) shall have both predecessors and successors.
 - (F) Listing of Project submittals, approvals, and material/equipment site deliveries dates.
 3. The identity of planned and reasonably anticipated inclement weather as identified in Article 4.3.7.2 of the General Conditions.
 4. The identity of long lead items and delivery dates of all major pieces of equipment or materials.
 5. The schedule must be resource loaded and identify the contractor performing the work and the number of workers needed to perform each activity.
- B. The General Contractor shall, within **fourteen (14) calendar days** following Notice to Proceed, submit to the Engineer, Owner, Owner's rep & Program / Construction Manager, **a Computerized Construction Schedule** in precedence format that is acceptable to the owner.
- . The Detailed Construction Schedule shall show:
- a. The order and interdependencies of the contractor's activities and the major points of interface or interrelation with the activities of others, including Specific Dates for completion.
 - b. Conformance with and identification of the specified mandatory milestone dates specified in the Contract Documents.
 - c. The description and quantity of work by activity.

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- d. The time required for engineering, preparation and approval of shop drawings, manufacturing, and delivery of Contractor-furnished permanent plant materials.
 - e. The time required for procurement, delivery, and erection of the Contractor's permanent plant materials.
 - f. Delivery of Owner-furnished material and equipment.
 - g. Shop fabrication and delivery.
 - h. Critical Path (or Paths).
 - i. Erection and installation.
 - j. Testing of equipment and materials.
 - k. Activity calendars, incorporating potential weather delays, or multi- work periods.
- C. The Detailed Construction Schedule shall indicate an early completion date for the project that is no later than the project's required completion date. All activity durations shall be given in workdays. The Schedule shall also indicate each of the following:
- 1. Interfaces with the work of outside contractors, e.g., utilities, power, and with any separate contractor.
 - 2. Estimated duration time for each activity.
 - 3. Early start date for each activity.
 - 4. Late start date for each activity.
 - 5. Early finish date for each activity.
 - 6. Late finish date for each activity.
 - 7. Float available for each path of activities containing float.
 - 8. Actual start date for each activity begun.
 - 9. Actual finish date for each activity completed.
 - 10. Identification of all critical path activities in the schedule analysis.
 - 11. The critical path for the project, with said path of activities being clearly and easily recognizable on the time-scaled network diagram. The relationship between all non-critical activities and activities on the critical path shall be clearly shown on the network diagram.
 - 12. The dollar value of each activity in relation to the schedule of values, if required by the Owner.

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13. The responsibility code for the Contractor or Subcontractor performing each activity or portion thereof.
- D. The Engineer, Owner, Owner's rep & Program / Construction Manager will review the Contractor's Detailed Construction Schedule, for compatibility with the Project Milestones, Completion Schedule, and Project Expeditors' Schedule. If requested, a meeting will be held between the Engineer, Owner, Owner's rep & Program / Construction Manager and Contractor to resolve any conflicts in the Contractor's schedule. The Contractor shall revise his schedule as required by the Engineer, Owner, Owner's rep & Program / Construction Manager to ensure completion of the Project in accordance with the Project's Milestone and Completion Dates and shall submit his revised schedule to the Engineer, Owner, Owner's rep & Program / Construction Manager within five (5) calendar days.
- E. Within **fourteen (14) calendar days** following Notice to Proceed, the Contractor shall submit a Schedule of Values for review by the Engineer, Owner, Owner's rep & Program / Construction Manager. The Schedule of Values will allocate a dollar value (cost) for each activity. Each activity cost allocation shall include a labor, equipment and material cost and a pro rata contribution to overhead and profit. The sum of all activity costs shall be equal to the total Contract Sum. Each activity cost shall be coded with a cost code corresponding to the subcontractor responsible for performing the Work so that subtotals for each division of the Work can be prepared.
- F. Approval by the Engineer, Owner, Owner's rep & Program / Construction Manager of the Project Expediter's Project Construction Schedule is advisory only and shall not relieve the Contractors of the responsibility for accomplishing the Work within each and every Contract-required Milestone and Completion date. Omissions and errors in the approved Project Construction Schedule shall not excuse performance which is not in compliance with the contract. Acceptance by the Engineer, Owner, Owner's rep & Program / Construction Manager in no way makes the Engineer, Owner, Owner's rep & Program / Construction Manager an insurer of the Project Construction Schedule's success or liable for time or cost overruns flowing from its shortcomings. The Owner hereby disclaims any obligation or liability by reason of Engineer, Owner, Owner's rep & Program / Construction Manager acceptance of or acquiescence to the Project Construction Schedule.
- G. The **Project Expediter / General Contractor** shall compile, organize, and present a fully integrated Computerized Project Construction Schedule to the Engineer, Owner, Owner's rep & Program / Construction Manager within **fourteen (14) calendar days** of Notice to Proceed. The Project Expediter shall provide five (5) hard copies of the Detailed Construction Schedule, and one electronic Primavera P6 compatible file copy, the Schedule of Values and Computer Reports to the Engineer, Owner, Owner's rep & Program / Construction Manager and Prime Contractors for final review and acceptance. The Project Expediter shall use the approved Project Construction Schedule in planning, organizing, directing, coordinating, performing and executing the work (including all activities of Subcontractors, equipment deliveries, vendors, and suppliers) and shall be the basis for evaluating the progress of the Work, subject to such revisions made in such schedule as provided for herein or in the Contract Documents.
- H. The **Project Expediter** will develop and maintain the overall Project Construction Schedule, of which the Contractor's Detailed Construction Schedule will be a part. This

CONSTRUCTION SCHEDULES & REPORTS

schedule will be in precedence format and will be computer generated and updated and with the inclusion of the approved prime contractor schedules will be the controlling schedule document utilized for managing overall project construction.

1.04 COMPUTER COST AND SCHEDULE REPORTS

A. Every month the Project Expediter will generate all monthly Prime contractors' progress documents (i.e., monthly Turn-a-round Documents and the progress payment application Cost/Schedule Reports) from the Detailed Construction Schedule, based on the Progress Reports received from the Contractors. These Reports will reflect the progress of the project in respect to both cost and time.

B. Report Content:

1. The initial and subsequent Schedule Reports shall include the following minimum information for each activity: activity number, by total float (from the least to the most), and late start date, in chronological order:

- a. activity number
- b. activity description
- c. estimated duration in days
- d. early and late start dates
- e. early and late finish dates
- f. percentage of activity completed as of each report
- g. total float-positive/days behind schedule-negative
- h. responsibility for activity.

The Project Expediter will produce monthly (4) four schedule reports. The reports are:

1. All activities on the Project Construction Schedule sorted by activity number.
 2. Activity by Prime Contractor sorted. Further sorted by activity number.
 3. All activities for prime contractors sorted by total float.
 4. All activities by late start in chronological order.
2. The initial and subsequent Cost Reports shall include the following activity information sorted by trade:
- a. activity number
 - b. activity description

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- c. current month percentage of value of work in place against Total Value
- d. previous month percentage of value of work in place against Total Value
- e. total cost of each activity

1.05 UPDATES

- A. An updated project schedule shall be provided at each construction progress meeting.
- B. Each updated schedule must include the original base line schedule that was accepted by the Engineer, Owner, Owner's rep & Program / Construction Manager, and signed by each Prime Contractor. It also needs to reflect actual progress and anticipated completion durations.

1.06 PROGRESS PAYMENTS

- A. Five (5) calendar days prior to the date of application for Progress Payment, **each Prime Contractor's Project Manager and Superintendent**, the Engineer, Owner, Owner's rep & Program / Construction Manager shall meet at the job site for the purpose of reviewing the Contractor's report of actual progress, and obtaining from the Contractor (following his meeting with all concerned Subcontractors and suppliers) up-to-date and accurate progress data.
- B. Before the date of Application for Progress Payment, the Project Expediter shall produce copies of all reports referred to in the contract documents.
- C. The submission and approval of progress updates and the reports calculating the value of work done for any given pay period for each activity based on the percentage complete for that activity less the amount previously paid for past percentages complete and percent of retainage shall be an integral part and basic element of the application upon which Progress Payments shall be made pursuant to the provisions of the General Conditions. The Contractor shall be entitled to progress payments only as determined from the current updated and approved Project Cost Report. Each month the updated and approved Project Cost Report shall be attached to AIA form G702 in submitting payment applications.
- D. Due to the fact that the Schedules and Reports System may not be fully operational before thirty (30) days after the Notice to Proceed, the Contractor may be due one Provisional Progress Payment for mobilization, overhead, procurement of bonds and insurance, and general conditions. However, no payment for work will be approved until the Contractor has complied with the provisions of this Section.
- E. The following outlines the Contractor's pay cycle process Payment cycle (Payment check issued on approximately the 15th on the following month):
 - 1. Current month construction progress status approved by Design Consultant by 20th of the month.

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2. Current month Payment Application approved by Design Consultant, and Owner by 25th of the month.

2.00 CONTRACTOR'S ORGANIZATION

The Contractor shall maintain, as part of its organization, a staff/or consultant of sufficient knowledge in the use and application of CPM in a Primavera P6 compatible format and whose responsibility will be to prepare input information for the Detailed Construction Schedule, monitor progress, provide input for updating and revise logic diagrams when necessary.

2.01 SPECIFIC DATES

The Contractor is required to adhere to the Specific Dates as set forth in the Contract Documents.

2.02 RECOVERY SCHEDULE

Pursuant to the General Conditions, should the Project Coordinator / Expediter's approved Project Construction Schedule fall behind schedule to the extent that any of the critical activities, or specific milestone dates or completion dates fall behind by 14 days or more, or in the opinion of the Engineer, Owner, Owner's rep & Program / Construction Manager are in jeopardy, the Contractor shall be required to, at no extra cost to the Owner, prepare and submit to the Owner, Design Consultant and Project Expediter a supplementary Recovery Schedule, in a form and detail appropriate to the need, to explain and display how they intend to reschedule those activities to regain compliance with the Project Construction Schedule during the immediate subsequent pay period. This recovery schedule must indicate how the contractor / contractors intend to make up the delay in the project, either by additional shifts, additional workdays (weekends & holidays), or by additional crews or crew sizes.

2.03 NETWORK REVISIONS

- A. Should the Contractor, after approval of the initial Project Construction Schedule, desire to change his plan of construction, he shall submit his requested revisions to the Engineer, Owner, Owner's rep & Program / Construction Manager along with a written statement of the revisions including a description of the logic for rescheduling the work, methods of maintaining adherence to intermediate milestones and Specific Dates and the reasons for the revisions. The Contractor shall revise his schedule to include the effect of Changes, acts of God or other conditions or events which have affected the network. If the requested changes are acceptable to the other Prime Contractors, the Engineer, Owner, Owner's rep & Program / Construction Manager, and they do not adversely impact any Milestone or Completion Dates, they will be incorporated into a revised Approved Project Construction Schedule, to be compiled and produced by the Project Expediter in the next reporting period. All costs associated with such revision shall be at the sole expense of the contractor.
- B. When the Owner orders changes by Change Order which have the potential to impact the Contract milestones or Specific Dates stipulated in the Contract Documents, a Revised Network will be prepared by the Contractor and provided to the Engineer, Owner, Owner's rep & Program / Construction Manager for concurrence or revision as he deems necessary.

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After the revised network has been mutually agreed upon, it will be incorporated into a revised Project Construction Schedule, to be compiled and produced by the Project Expediter. Change Order logic will affect only those activities and performance dates directly concerned. Adjustments in Scheduled intermediate Completion Dates or for the Contract as a whole will be considered only to the extent that there is insufficient remaining float to absorb these changes.

- C. Any change to the approved Project Construction Schedule must be approved in writing by the Engineer, Owner, Owner's rep & Program / Construction Manager.
- D. Neither the updating or revision of approved Project Construction Schedule nor the submission, updating, change or revision of any report or schedule submitted to Engineer, Owner, Owner's rep & Program / Construction Manager by Contractor under this Section nor Owner's review or non-objection of any such report or schedule shall have the effect of amending or modifying, in any way, the Contract Time, any Contract Completion Date, or Contract Milestone Dates or of modifying or limiting in any way Contractor's obligations under this Contract.

2.04 FLOAT TIME

- A. Float or slack time is defined as the amount of time between the earliest start date and the latest start date or between the earliest finish date and the latest finish date of a chain of activities on the Detailed Construction Network. Contractor's work shall proceed according to early start dates, and the Engineer, Owner, Owner's rep & Program / Construction Manager shall have the right to reserve and apportion float time according to the needs of the project. The Contractor acknowledges and agrees that actual delays, affecting paths of activities containing float time, will not have any effect upon contract completion times, providing that the actual delay does not exceed the float time associated with those activities.
- B. Extensions of time for performance as described in the Contract Documents will be granted only to the extent that time adjustment for the activity or activities affected by any condition or event which entitles the Contractor to a time extension exceed the total float or slack along the path of activities affected at the time of Notice to Proceed of a Change Order or the commencement of any delay or condition for which an adjustment is warranted under the Contract Documents.

2.05 REQUESTED TIME ADJUSTMENT SCHEDULE:

- A. The updated approved Project Construction Schedule submitted by Project Expediter shall not show a completion date later than the Contract Time, subject to any time extensions approved by Owner. If Contractor believes he is entitled to an extension of the Contract Time under the Contract Documents, Contractor shall submit to Owner and Design Consultant, a separate schedule analysis (entitled "Requested Time Adjustment Schedule") indicating suggested adjustments in the Contract Time which should, in the opinion of Contractor, be made in accordance with the contract Documents by time extension, due to changes, delays or conditions occurring during the past month or previously, or which are expected or contemplated by Contractor (whether such conditions are excusable under the Contract or are alleged to be due to Contractor or Owner fault); this separate schedule, if submitted, shall be time-scaled utilizing a computer generated and computer-drawn network analysis schedule, unless otherwise approved by the Engineer, Owner, Owner's rep &

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Program / Construction Manager and shall be accompanied or preceded by a formal time extension request as required by the Contract and a detailed narrative justifying the time extension requested.

- B. Neither the Engineer, Owner, Owner's rep & Program / Construction Manager shall have any obligation to consider any time extension request unless the requirements of all of the Contract Documents, are complied with the Owner shall not be responsible or liable to Contractor for any constructive acceleration due to failure of Owner to grant time extensions under the Contract Documents should Contractor fail to substantially comply with the submission requirements and the justification requirements of this Contract for time extension requests. Contractor's failure to perform in accordance with the approved Project Construction Schedule shall not be excused, nor be chargeable to Owner, because Contractor has submitted time extension requests or a "Requested Time Adjustment Schedule."

2.06 COORDINATION

- A. The Contractor shall coordinate his work with that of other contractors and shall cooperate fully with the Engineer, Owner, Owner's rep & Program / Construction Manager in maintaining orderly progress toward completion of the work as scheduled. The Engineer, Owner, Owner's rep & Program / Construction Manager decisions regarding priority between the Contractor's work and the work of other contractors at the site shall be final. If the Contractor's critical path work is delayed by the Engineer, Owner, Owner's rep & Program / Construction Manager decision, the Contractor shall submit any required time extension requests to the Owner in accordance with the Contract Documents.
- B. The milestone dates referred to in the Contract Documents for delivery of Owner-furnished equipment and materials and interface activities of other contractors on the site are based on dates set forth in separate contracts with the Owner.
- C. Failure of Owner-furnished equipment and materials to arrive as scheduled, or failure of other construction contractors to meet their schedule, shall not be justification for an extension of time, except where such failure causes, in the opinion of the Engineer, Owner, Owner's rep & Program / Construction Manager a delay in the Contractor's critical path work, in which case the provisions of the General Conditions regarding extensions of time and extra work shall apply.
- D. The Contractor shall keep himself, and his subcontractors, advised at all times during the course of the Work regarding delivery status of Owner-furnished equipment and materials and of the progress of construction work being performed under separate contracts.
- E. The Engineer, Owner, Owner's rep & Program / Construction Manager will, upon written request by the Contractor, furnish delivery information which may be available to the Engineer, Owner, Owner's rep & Program / Construction Manager.

2.07 SCHEDULE OF OFF-SITE ACTIVITIES

- A. The Contractor shall include in his Detailed Construction Network all procurement related activities which lead to the delivery of materials to the site in a timely manner. Upon written approval by the Engineer, Owner, Owner's rep & Program / Construction Manager, these

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activities may be submitted as a separate Off-Site Activities Schedule, properly correlated to the Detailed Construction Schedule. The schedule of off-site activities shall include, but is not limited to, the following:

1. Dates for submittals, ordering, manufacturing, or fabricating, and delivery of equipment and materials. Long lead items requiring more than one month between ordering and delivery to site shall be clearly noted.
 2. All significant activities to be performed by the Contractor during the fabrication and erection/installation in a Contractor's plant or on a job site, including materials/equipment purchasing, delivery; and
 3. Contractor's drawings and submittals to be prepared and submitted to the Design Consultant.
- B. The Contractor shall be solely responsible for expediting the delivery of all material to be furnished by him so that the construction progress shall be maintained according to the approved Project Construction Schedule for the Work as approved by the Engineer, Owner, Owner's rep & Program / Construction Manager.
- C. The Engineer, Owner, Owner's rep & Program / Construction Manager shall be advised in writing by the Contractor whenever it is anticipated by the Contractor that the delivery date of any material and/or equipment furnished by the Contractor for installation will be later than the delivery date shown on the schedule, subject to schedule updates.
- D. Submittals, equipment orders and related items are to be treated as schedule activities and shall be given appropriate activity numbers.
- E. The Contractor, in developing his off-site and procurement schedules, will ensure that off-site activities do not control the critical path of on-site activities.

2.08 CONTRACTOR COVENANTS AND GUARANTEES

- A. Contractor covenants and guarantees that Contractor will not:
1. Misrepresent to Engineer, Owner, Owner's rep & Program / Construction Manager its planning scheduling or execution of the Work.
 2. Utilize schedules materially different from those made available by Contractor to the Engineer, Owner, Owner's rep & Program / Construction Manager or any Subcontractor or separate Contractors for the direction, execution, and coordination of the Work, or which are not feasible or realistic.
 3. Prepare schedules, updates, revisions, or reports for the work which do not accurately reflect the actual intent or reasonable and actual expectations of Contractor and its Subcontractor as to:
 - (a) The sequences of activities,
 - (b) The duration of activities,

CONSTRUCTION SCHEDULES & REPORTS

- (c) The responsibility of activities,
 - (d) Resources availability,
 - (e) Labor availability or efficiency,
 - (f) Foreseeable weather conditions,
 - (g) The value associated with the activity,
 - (h) The percentage complete of any activity,
 - (i) Completion of any item of work or activity,
 - (j) Project milestone completion,
 - (k) Delays, slippages, or problems encountered or expected,
 - (l) Subcontractor requests for time extensions or delay claims of subcontractors, and
 - (m) Float time
- B. Contractor's failure to substantially comply with the foregoing covenant and guarantee shall be a substantial and material breach of contract which will permit Owner to terminate Contract for default, or withhold payments under the Contract Documents, and shall entitle Owner to the damages afforded for misrepresentation or fraud by these Contract documents or applicable law.
- C. Should Contractor fail to substantially comply with the provisions of the Contract documents relating to planning, scheduling and execution of the Work by the overall project schedule, Owner and the Design Consultant shall have the right, at their option, after five (5) days' notice, to retain the services of scheduling consultants or experts (including attorneys if necessary in their opinion) to prepare a schedule in accordance with the Contract Documents and to review and analyze same, in order to allow Engineer, Owner, Owner's rep & Program / Construction Manager to evaluate the program of the Work by Contractor, to determine whether Contractor is substantially complying with the Contract Documents, and to direct such action on the part of the contractor to ensure that Contractor will meet the Project's Construction Schedule and all Milestone and Completion Dates. All costs incurred by Owner in preparing the schedule hereunder shall be charged to the responsible Contractor(s). If Contractor fails to substantially comply with the scheduling and execution of the work requirements of the Contract Documents, Contractor hereby agrees to pay all costs for a 3rd party scheduling consultant (selected by the Owner) for the development and twice monthly updating of the construction schedule.

2.09 DEFAULT

Failure of the Contractor to substantially comply with the requirements of this Section shall constitute reason that the Contractor is failing to prosecute the Work with such diligence as

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will ensure its completion within the Contract times and shall be considered grounds for termination by the Owner, pursuant to the General Conditions.

END OF SECTION 01 32 16

SUBMITTALS

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Submittal schedule.
 - 3. Shop Drawings.
 - 4. Product Data.
 - 5. Samples.
 - 6. Quality assurance submittals.
- B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
 - 1. Permits.
 - 2. Applications for Payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of subcontractors.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Applications for Payment" specifies requirements for submittal of the Schedule of Values.
 - 2. Division 1 Section "Quality Control" specifies requirements for submittal of inspection and test reports.
 - 3. Division 1 Section "Contract Closeout" specifies requirements for submittal of Project Record Documents and warranties at project closeout.

.3 DEFINITIONS

- A. Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.

SUBMITTALS

- B. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.

.4 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Designer/Program Manager reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
 - 3. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.
 - a. Allow 2 weeks for initial review. Allow additional time if the Program Manager must delay processing to permit coordination with subsequent submittals.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.
 - c. Allow 2 weeks for reprocessing each submittal.
 - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Program Manager sufficiently in advance of the Work to permit processing.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
 - 1. Provide a space approximately 4 by 5 inches (100 by 125 mm) on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 - 2. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of the Designer/Program Manager.
 - d. Name and address of the Contractor.
 - e. Name and address of the subcontractor.
 - f. Name and address of the supplier.
 - g. Name of the manufacturer.
 - h. Spec section number & name

SUBMITTALS

- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Program Manager using a transmittal form. The Program Manager will not accept submittals received from sources other than the Contractor.
 - 1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within 15 days after the date established for "Commencement of the Work."
 - 1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values."
 - 2. Within each time bar, indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
 - 3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
 - 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
 - 5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
 - 6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Program Manager's procedures necessary for certification of Substantial Completion.
- B. Distribution: Following response to the initial submittal, print and distribute copies to the Program Manager, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
 - 1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- C. Schedule Updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

.6 SUBMITTAL SCHEDULE

- A. A submittal schedule is required for this project. The schedule shall be organized based upon the technical specification index for divisions 2-49 of this project.

SUBMITTALS

.7 DAILY CONSTRUCTION REPORTS

- A. Prepare a weekly construction report recording the following information concerning events at the site:
 - 1. List of subcontractors at the site.
 - 2. Approximate count of personnel at the site.
 - 3. High and low temperatures, general weather conditions.
 - 4. Accidents and unusual events.
 - 5. Meetings and significant decisions.
 - 6. Stoppages, delays, shortages, and losses.
 - 7. Meter readings and similar recordings.
 - 8. Emergency procedures.
 - 9. Orders and requests of governing authorities.
 - 10. Change Orders received, implemented.
 - 11. Services connected, disconnected.
 - 12. Equipment or system tests and startups.
 - 13. Partial Completions, occupancies.
 - 14. Substantial Completions authorized.

.8 SHOP DRAWINGS

- A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included by sheet and detail number.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - 6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 36 by 48 inches (890 by 1220 mm).
 - 7. Initial Submittal: Submit 2 blue- or black-line prints for review
 - 8. Final Submittal: Submit 3 blue- or black-line prints and 2 additional prints where required for maintenance manuals.
 - a. One of the prints returned shall be marked up and maintained as a "Record Document."
 - 9. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

.9 PRODUCT DATA

SUBMITTALS

- A. Collect Product Data into a single submittal for each specification section or each element of construction or system. Partial submittals will NOT BE accepted. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 3. Submittals: Submit 2 copies of each required submittal; submit 4 copies where required for maintenance manuals. The **Owner** will retain one and will return the other marked with action taken and corrections or modifications required.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 4. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

.10 SAMPLES

- A. Samples are required as indicated in technical specification divisions 2-49 for this project.

.11 QUALITY ASSURANCE SUBMITTALS

- A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

SUBMITTALS

- B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.
 - 1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.
- C. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 1 Section "Quality Control."

.12 Program Manager's ACTION

- A. Except for submittals for the record or information, where action and return is required, the Owner will review each submittal, mark to indicate action taken, and return promptly.
 - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Report: The Program Manager will attach to each submittal a uniform, action summary sheet. The Program Manager will mark the sheet appropriately to indicate the action taken
- C. Unsolicited Submittals: The Owner will return unsolicited submittals to the sender without action.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 33 00

SPECIAL PROJECT PROCEDURES

The “SPECIAL PROJECT PROCEDURES” has been developed as a working tool with the sole purpose of stimulating action by all parties. It is a single source of information specific to the DPS Sherwood Githens Middle School Chiller Replacement project. The issues discussed in the plan are applicable to all parties. It is a tool that will be modified as the scope of work changes and site-specific conditions change. The following items make up the SPECIAL PROJECT PROCEDURES:

1. STUDENT SAFETY

- ◆ Construction fencing will be utilized as indicated on the site plan to control the construction zone and generate a safe path of travel for students, staff, and the public.
- ◆ 10 mph speed limit for construction traffic will be enforced.
- ◆ Roadways being shared with school and construction traffic will be closely supervised.

2. STUDENT SECURITY

- ◆ No Construction personnel in school building during school hours without authorization from the principal or owner.

3. PARKING

- ◆ Contractor to prepare a Site Utilization Plan that shows parking, porta-john, lay-down, etc. for approval.
- ◆ Construction parking in designated contractor parking, staging, and overflow parking areas only.

4. EMERGENCY ACCESS TO SITE

- ◆ Fire extinguishers will be placed throughout the site with the fire marshal’s input.

5. VEHICULAR TRAFFIC ISSUES

- ◆ During summer school days, deliveries will be limited to **after drop-off and before pick-up** in an effort to not add to the existing traffic.
- ◆ Buses / students arrive in the morning ends at 7:15am – 8:15am
- ◆ Buses / students depart in the afternoon begins at 3:30pm.

6. WORKERS CODE OF CONDUCT

- ◆ Zero tolerance policy for cursing, cat calling, or unauthorized inter-action with students, staff, or parents.
- ◆ Swift prosecution of illegal drug, alcohol, tobacco, or firearm violations.

SPECIAL PROJECT PROCEDURES

- ◆ Security background checks are required for every worker on site.

7. CONSTRUCTION SCHEDULE & SEQUENCE

- Construction locations and sequencing will be coordinated with the school principal and school construction and capital planning so as to not interfere with normal school operations.

8. CONSTRUCTION WORK HOURS

- ◆ Work hours will be from 7:00am – 5:00pm generally.
- ◆ Second shift work “MAY” be after approval by DPS.

9. DIRT, DUST AND NOISE

- ◆ Daily clean up will be done by the contractors to maintain a clean site.
- ◆ Roadway debris will be kept clean using a tractor mounted road sweeper or other appropriate means.
- ◆ Noise in adjacent areas to summer school classrooms will be kept to a minimum so as to not interfere with class studies. **NO NOISE** is permitted during testing.

10. BI-WEEKLY UPDATE MEETINGS

- ◆ Bi-weekly update meetings will be scheduled during the Kick-Off meeting.

11. COMMUNICATIONS PROCEDURES

- ◆ All communication to the principal or the Owner will flow through
Dewberry Engineers Inc.
Bill Hamilton, PE
whamilton@dewberry.com
984.833.4832

DURHAM PUBLIC SCHOOL BOARD POLICY

Descriptor Term: USE OF TOBACCO PRODUCTS	Descriptor Code: 2210
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Draft Date: August 26, 1992	Date Issued by Superintendent: August 26, 1992	Revised by Board: October 24, 2013
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The Board of Education recognizes that the use of tobacco products is a health, safety and environmental hazard for students, employees, visitors and school facilities. The Board also acknowledges that adult employees serve as role models for students and that the Board's acceptance of any use of tobacco products implies school approval, if not endorsement, of such use. In addition, the Board recognizes that it has an obligation to promote a healthy learning and working environment, free from unwanted smoke, for the students, employees and visitors of the school system.

Tobacco Use Prohibited

No student, staff member school visitor or any other person is permitted to use any tobacco product at any time, including non-school hours, in school buildings, in school facilities, on school campuses, and in or on any other school property owned or operated by the Durham Public Schools. Further, no student is permitted to possess a tobacco product while in any school building, while on school grounds or property or at any school-sponsored or school-related event or at any other time that students are under the authority of school personnel.

The use of any tobacco product is also prohibited by any person attending a school-sponsored event, no matter where located, when in the presence of students or school personnel or in an area where smoking is otherwise prohibited by law.

Tobacco products may be included in instructional or research activities in public school buildings if the activity is conducted or supervised by the faculty member overseeing the instruction or research and the activity does not include smoking, chewing, or otherwise ingesting the tobacco product.

For the purposes of this policy, "tobacco product" is defined to include cigarettes, cigars, pipes, chewing tobacco, snuff, and any other items containing tobacco, or any items reasonably resembling tobacco or tobacco products, including electronic cigarettes. Tobacco use includes smoking, chewing, dipping, or any other use of tobacco products.

Legal Reference: [G.S.115C-407](#)

Legal Reference: [G.S.143-595 through -601](#); [20 USC 6081-6084](#)



**Lakeview School Controls
Replacement**

[photograph here]

**[CONTRACTOR
NAME HERE]**

TAG # 001

CONSTRUCTION FACILITIES

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

1.1 Related Documents

- A. The General Conditions of the Contract apply to this section.
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 Summary

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities required include, but are not limited to:
 - 1. Water service and distribution.
 - 2. Temporary electric power and light.
 - 3. Telephone service.
 - 4. Storm and sanitary sewer.
 - 5. Natural gas service and distribution.
- C. Temporary construction and support facilities required include, but are not limited to:
 - 1. Temporary climate conditioning.
 - 2. Field office and storage sheds.
 - 3. Temporary roads and paving.
 - 4. Sanitary facilities, including drinking water.
 - 5. Temporary enclosures.
 - 6. Hoists
 - 7. Temporary Project identification signs
 - 8. Waste disposal services.
 - 9. Rodent and pest control.
 - 10. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities required include, but are not limited to:
 - 1. Temporary fire protection.
 - 2. Barricades, warning signs, lights.
 - 3. Sidewalk bridge or enclosure fence for the site.
 - 4. Environmental protection.
- E. The responsibility to install, maintain, and remove this Work shall be the Contractor's. Temporary facilities provided by the Contractor include, but are not necessarily limited to:

- Water service and distribution (including irrigation well(s)), or water storage tanks as required.
- Temporary electric power and light.
- Telephone service
- Storm water
- Sanitary sewer.
- Temporary climate conditioning
- Field office for Owner and General Contractor (Owner's office to be located in the General Contractor's office trailer).
Furnished with desk, chair, file cabinet, power, phone, data outlets and internet access.
- Field offices & storage sheds for Contractors & subcontractors

CONSTRUCTION FACILITIES

- Temporary roads and paving
- Sanitary facilities, including drinking water
- Temporary enclosures
- Hoists
- Temporary Project identification signs and bulletin boards
- Waste collection and disposal services
- Rodent and pest control.
- Construction aids and miscellaneous services and facilities
- Temporary fire protection.
- Barricades, warning signs, lights.
- Sidewalk bridge or enclosure fence for the site.
- Environmental protection.
- Protection of stored materials
- Stairs (temporary and permanent)

1.3 Definitions

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weather-tight; exterior walls are insulated and weather-tight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 Use Charges

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

1.5 Submittals

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures/performance on temporary utilities.
- B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within fifteen (15) days of the Notice to Proceed.
- C. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.6 Quality Assurance

- A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including but not limited to:
 - 1. Building Code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, Fire Department and Rescue Squad rules.

CONSTRUCTION FACILITIES

5. Environmental protection regulations.
 - B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations"; ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities".
 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC for industry recommendations.
 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electrical service. Install services in compliance with National Electric Code and NFPA 70.
 - C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.
- 1.7 Project Conditions
- A. Temporary Utilities: At the earliest feasible time, and when acceptable to the Owner, change over from use of temporary service to use of the permanent service.
 - B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention and safety measures. Do not operate facilities or utilities in a manner causing overloads, or interference's with Work progress. Do not allow hazardous, dangerous, unsanitary or public nuisances to develop. Regularly inspect and promptly correct non-conforming conditions.
 - C. The General Contractor is responsible to maintain the area inside the construction fencing and or limits of construction for the duration of the project. This includes cutting the grass and weed eating along the fence and around any objects weekly, and picking up trash and debris on a daily basis.

PART 2 - PRODUCTS

- 2.1 Materials
- A. General: Provide new materials suitable for the use intended; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used.
 - B. Pavement: Comply with Division 32 Section "Asphalt Paving."
 - C. Wood Enclosure Fence: Plywood, 6 feet high, framed with four 2-by-4-inch rails, with preservative-treated wood posts spaced not more than 8 feet apart.
 - D. Lumber and Plywood: Comply with requirements in Division 6, Section "Rough Carpentry."
 - E. Gypsum Board: Minimum 1/2 inch thick by 48 inches wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36.
 - F. Insulation: Un-faced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
 - G. Paint: Comply with requirements in Division 9 painting Sections.
- 2.2 Temporary Facilities
- A. General: Provide equipment suitable for the use intended; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used.
 - B. Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel. Keep office clean and orderly. Furnish and equip offices as follows:
 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 2. Conference room of sufficient size to accommodate meetings of 20 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle

CONSTRUCTION FACILITIES

- on each wall. Furnish room with conference table, chairs, and 4-foot by 8 foot tack board.
- 3. Drinking water and private toilet.
- 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
- 5. Lighting fixtures capable of maintaining average illumination of 40 fc at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.
- D. Electrical Outlets: Provide properly configured NEMA polarized outlets that prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset buttons and pilot lights for connection of power tools and equipment within 100 ft of all work areas.
- E. Electrical Power Cords: All Contractors shall provide UL tested and labeled, grounded extension cords of an appropriate gauge for the intended application; use “hard-service” cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- F. Lamps and Light Fixtures: Provide GFCI protected general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- G. HVAC: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction.
- H. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical aerated re-circulating type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. Include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project’s needs.
- I. First Aid Supplies: Comply with governing regulations.
- J. Fire Extinguishers: Provide hand-carried, portable UL-rated, class “ABC” fire extinguishers for temporary office and similar spaces. In other locations, provide hand-carried, portable, UL-rated, class “ABC” dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes suited for the exposures.
 - 1. Comply with NFPA 10 and 241 for classification extinguishing agent and size required by location and class of fire exposure.
 - 2. Provide a designated fire watch individual with welding blankets and welding screens as required to limit risks associated with welding, cutting and burning.
- K. Temporary Project Sign: Provide a construction sign as described herein, in format indicated following this section, in a location directed by the Architect/Owner. The Project sign shall be double faced, two-directional sign consisting of two sheets of ¾” X 4’ 0” x 8’ 0” exterior grade plywood, attached with ¼” diameter bolts through two 4 x 4 wood posts set 3’ 0” deep in compacted earth. The format shall be as indicated following this section and will include Owner’s name and logo, project title, Architect’s name and logo, and Contractor’s name and

CONSTRUCTION FACILITIES

logo. Additionally, provide directional information signs to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.

PART 3 - EXECUTION

3.1 Installation, General

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.
- C. The cost for installation, maintenance, removal or use of temporary facilities and utilities are not chargeable to the Owner or Architect and will not be accepted as a basis of claims for a Change Order.
- D. All temporary utilities' operational expenses shall be borne by the General Contractor, unless otherwise indicated.
- E. Utilities or facilities not referenced in this section for installation, but required for the full development of the Project shall be installed and maintained in a workmanlike manner. The cost for unspecified facilities shall be borne by the General Contractor if reasonably inferable from the Construction Documents.

3.2 Temporary Utility Installation

- A. General: Engage the appropriate Utility Company to install temporary service or connect to existing service. Where the Utility provides only part of the service, provide the remainder with matching compatible materials and equipment; comply with the Utilities recommendations.
 - 1. Arrange with the Utility and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
 - 2. Obtain easements to bring temporary utilities to the site, where the Owners easements cannot be used for that purpose.
 - 3. Provide adequate capacity at each stage of construction. Prior to temporary utility availability provide trucked-in services.
 - 4. Cost or use charges for temporary facilities are not chargeable to the Owner or Architect and will not be accepted as the basis of claims for a change order.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction. Construct irrigation well(s) as required to maintain grass and landscaping. See Division 1 Section "Allowances" for additional information.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Temporary HVAC systems: Provide temporary climate conditioning in any building area until the permanent HVAC system is operational, especially if the current Project schedule indicates the start of the ceiling tiles, carpeting, wood casework, or other environmentally sensitive system or material. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy. The General Contractor

CONSTRUCTION FACILITIES

must include in his critical path schedule provisions for electrical power, natural gas service, water, sewer and storm drainage utilities to be fully functional and available to enable the HVAC systems to be operated as required to facilitate the installation of the ceiling tile, carpet or wood casework, or other environmentally sensitive system or material. He shall assume responsibility for providing heating or cooling after the current Project schedule indicates the start of the ceiling tiles, carpeting, or wood casework. The permanent systems in any area of the building shall not be started unless all doors and windows in exterior walls are installed, or suitable temporary construction is in place and building is relatively dust free (i.e., floors are broom clean, drywall finishing and paint spraying are completed). If in the Architect's sole opinion, conditions exist sufficient to comprise the "quality of the system" at the date of Acceptance by the Owner; the authorization to startup the permanent systems shall be withheld until such time as the unsatisfactory conditions are corrected. The additional cost to maintain the operation of the temporary heating or cooling system shall be the Contractor's. Systems shall operate sufficiently to maintain the minimum temperature and relative humidity of the designed system +/- 15 percent.

- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
- G. Lighting: When overhead floor or roof deck has been installed, provide GFCI protected temporary lighting with local switching. Install and operate temporary lighting that will fulfill security and protection requirements and provide adequate illumination for construction operations and traffic conditions. The temporary lighting system shall be installed in a manner such that it can be operated without operating the entire electrical system.
- H. Telephone Service: Provide temporary telephone service for the use of all personnel engaged in construction activities throughout the construction period. Install a separate line for each temporary office and first aid station. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants. Provide a dedicated telephone line for each facsimile machine and computer in each field office. At each telephone post a list of important telephone numbers.
 - 1. Provide superintendent with cellular telephone for use when away from field office.
- I. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully.
 - 1. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.
 - 2. If sewers are not available or cannot be used, provide and maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
- J. Storm water control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction sufficient to prevent flooding by runoff of storm water from heavy rains. Promptly remove and replace soils that become unsuitable for their intended purpose because of failure to comply with this requirement.
- K. The warranty on all equipment will be extended from start-up to one (1) year past the date of substantial completion of the Project. Extended warranties such as five year compressor warranties shall be extended beyond the period established by the actual start-up date of the equipment as defined herein.

3.3 Support Facilities Installation

- A. The General Contractor will locate field office, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access in the areas designated for same. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion and restore the site to the condition prior to

CONSTRUCTION FACILITIES

- mobilization, unless otherwise directed. Personnel remaining after Substantial Completion will be permitted to use permanent facilities under conditions acceptable to the Owner.
- B. The General Contractor will provide non-combustible construction for offices, shops and sheds located within the construction area or within thirty (30) feet of building lines. Comply with requirements of NFPA 241.
 - C. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas in same location as permanent roads and paved areas where possible. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
 - 1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 - 2. Prepare subgrade and install sub-base and base for temporary roads and paved areas according to Division 32 Section "Earth Moving".
 - 3. Recondition base after temporary use, including removing contaminated material, regarding, proof-rolling, compacting, and testing.
 - 4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Division 32 Section "Asphalt Paving."
 - D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire fighting equipment and access to fire hydrants.
 - E. De-watering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
 - 2. Remove snow and ice as required to minimize accumulations.
 - F. Parking: Provide temporary parking areas for construction personnel.
 - G. Project Identification and Temporary Signs: Provide Project identification and other signs. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
 - 1. Provide temporary, directional signs for construction personnel and visitors.
 - 2. Maintain and touchup signs so they are legible at all times.
 - H. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed from exposure, foul weather, other construction operations and similar activities.
 - 1. Where climate conditioning is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of conditioning. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 - 2. Install tarpaulins securely with non-combustible wood framing and other materials.
 - 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.
 - 4. Separate occupied areas of existing facilities from the construction areas with enclosures and dust partitions as needed.
 - I. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
 - J. Rodent and Pest Control: Before deep foundation Work has been completed, (if applicable) retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches and other pests. Employ this service to perform extermination and control procedures at regular intervals so the Project will be relatively free of

CONSTRUCTION FACILITIES

pests and their residues at Substantial Completion. Perform control operations in a lawful manner using environmentally safe materials. Submit the recommendations and reports of the exterminator to the Architect for review.

- K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.
- L. Temporary Elevator Use: Refer to Division 14 Sections for temporary use of new elevator.

3.4 Security and Protection Facilities Installation

- A. Do not change over from use of temporary security and protection facilities to permanent facilities until Substantial completion, or longer as requested by the Architect.
- B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 “Standard for Portable Fire Extinguishers” and NFPA 241 “Standard for Safeguarding Construction, Alterations and Demolition Operations”.
 - 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires.
 - 4. Provide supervision of welding operations, combustion type temporary heating units and similar sources of fire ignition.
- C. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- D. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security. Where materials and equipment must be stored and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- E. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways and soils might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful levels of noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- F. Protection Of Installed Work
 - 1. Protect installed work and provide special protection where specified in individual specification Sections.
 - 2. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
 - 3. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
 - 4. Protect, with durable sheet materials, finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
 - 5. Prohibit traffic on landscaped areas.
- H. Protection of Roof and Water-proofing
 - 1. Protect from damage due to subsequent construction operations.

CONSTRUCTION FACILITIES

2. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, comply with recommendations for protection from waterproofing or roofing material manufacturer.
3. For construction materials stored on the roof, store over plywood, particleboard, or other approved protection board. Do not exceed the design load with stored materials and other anticipated live loads.
4. Do not store construction materials on roof and flashing.
5. Where mechanical and other construction work is performed from the roof, the immediate area shall be protected with plywood, particleboard, or other approved protection board. Where construction workers are likely to walk protect similarly. Contractor shall provide protective covering on the roof after roofing is installed.
6. Remove protection board from the site upon completion of the work.

3.5 Operation, Termination and Removal

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by adverse weather conditions.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
 2. Prevent water filled piping from freezing.
 3. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or not later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
 1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.
 2. Remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other chemical compounds and other substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances as required by the governing authority.
 3. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
 - a. Replace air filters not less than once a month and clean inside of ductwork.
 - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
 - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION 01 52 00

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

- PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Recycling nonhazardous construction waste
 - 2. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.2 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Paint: Seal containers and store by type.

3.3 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

END OF SECTION 017419

CLOSEOUT PROCEDURES

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project Record Documents.
 - 3. Operation and maintenance manuals.
 - 4. Warranties.
 - 5. Instruction of Durham Public School's personnel.
 - 6. Final cleaning.
- B. Specific requirements of each contract are also indicated in individual Specification Sections, All Bid Documents and on Drawings.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Contractor to prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Durham Public Schools of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Durham Public Schools unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Durham Public Schools. Label with manufacturer's name and model number where applicable.

CLOSEOUT PROCEDURES

7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer, Owner, Owner's Rep or Program / Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, Owner, Owner's Rep or Program / Construction Manager, that must be completed or corrected before certificate will be issued.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Final Completion must be achieved within 30 calendar days of Substantial Completion.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer, Owner, Owner's Rep or Program / Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will accept for review, a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
- B. Organize list of spaces in sequential order.

CLOSEOUT PROCEDURES

1. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
2. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Page number.

1.6 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Engineer, Owner, Owner's Rep or Program / Construction Manager reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
 1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
 6. Provide a spreadsheet inventory list of all filters, sizes, locations, etc. prior to Substantial Completion.

CLOSEOUT PROCEDURES

- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Note related Change Orders, Record Drawings, and Product Data, where applicable.

1.7 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within 15 working days of completion of designated portions of the Work that are completed and occupied or used by Durham Public Schools during construction period.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual. Utilize the format of the attached Warranty and Closeout index at the end of section 01 78 36 Warranties.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy duty dividers with pre-numbered plastic coated tabs for each separate warranty. Provide a typed description of the product or installation on the index (see example at the end of this section). Include the spec section number, name of the product, and the name, address, and telephone number of the Installer on the Contractor and Supplier List at the front of the warranty binder.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor. Use the spine & cover sheet examples at the end of this section as templates.
 - 4. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.
- D. Provide letter certifying that no materials containing asbestos or lead have been used in the construction of this project.
- E. Provide 1 hard copies, and 1 electronic copy in Portable Document Format (PDF), of all closeout documents to Program Manager for distribution to Owner. This includes O & M Manuals, Project Documents, As-Built Drawings, Approvals, Certificates, and all warranty information. PDF is to be verified as fully searchable and Indexed by spec section number, or by plan section and page number for drawings, and the index shall be fully linked with the document pages.

CLOSEOUT PROCEDURES

1.8 O & M BINDERS

1. Bind O & M Data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual. Utilize the format of the attached O & M index at the end of this section.
2. Provide heavy duty dividers with pre-numbered plastic coated tabs for each separate Maintenance Manual. Provide a typed description of the product or installation on the index (see example at the end of this section). Include the spec section number, name of the product, and the name, address, and telephone number of the Installer on the Contractor and Supplier List at the front of the O & M binder.
3. Identify each binder on the front and spine with the typed or printed title "Operations & Maintenance," Project title or name, and name of the Contractor. Use the spine & cover sheet examples at the end of this section as templates.
4. Provide additional copies of each required warranty, as necessary, for inclusion in each related section of O & M Binder.

1.9 O & M Manuals Digital

- A. Assemble one (1) digital set of operations and maintenance data indicating the operation and maintenance of each piece of equipment... Include operation and maintenance data required in individual Specification Sections and as follows:
 1. Maintenance Data:
 - a. Manufacturers information, including list of spare parts
 - b. Name, address, and telephone number of Installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventive and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of maintenance service agreements.
 - h. Copies of warranties and bonds
- B. Organize operation and maintenance manuals per Section 1.10 Closeout Document Organization.
- C. Operation and Maintenance manuals must have operation and maintenance instructions. Submittals are not acceptable replacements for operation and maintenance instructions. If submittals are submitted instead of O&M information the manuals will not be reviewed and will be rejected. Operation and Maintenance manuals **must also contain** copies of approved **Submittal Product Data and Shop Drawings**
- D. Please make sure the following conditions are adhered to:
 1. All warranties must be made out to the owner, (i.e. Durham Public Schools) and contain the project name and address.
 2. All warranties must have proof of authenticity. Contractor and installer warranties must be signed originals specifying project, owner and warranty period commencing from the date of substantial completion. The document can state "from substantial completion" or give

CLOSEOUT PROCEDURES

the actual Engineer certified date. Either of the following is considered acceptable for manufacturers' warranties: An original manufacturer warranty with name of project, owner and date of substantial completion, a manufacturer warranty accompanied by an original letter from the manufacturer bearing original or electronic signatures of manufacturer, certifying the authenticity of the manufacturer's standard warranty naming project, school, and date of substantial completion; a manufacturer's warranty accompanied by a manufacturer's agent original signed letter certifying the authenticity and naming project, owner and date of substantial completion. A manufacturer's agent certification will only be considered acceptable if it is accompanied by a signed letter from the manufacturer verifying the agent has Power of Attorney or specific authority to authenticate the manufacturer's warranty as "project specific".

3. Check that warranties include labor where specified.
4. The Prime contractor's corporate seal (if a corporation) is required on section 00 65 23 warranty.
5. The commencement date for all warranties is the date of substantial completion. This date shall be listed on the warranty or shall say "from the date of declared substantial completion". A manufacturer's warranty on equipment shall always cover the gap from early start up to the date of substantial completion. This is a part of the contract and a cost of the work.
6. Warranties cannot contain conditional clauses (such as "this warranty is not or shall not become effective until the contractor has been paid in full").
7. **A separate training letter and associated sign in sheet are required for each owner training session.** A list of required training sessions will be included in the warranty closeout document binder.
8. Stock Materials shall be transported to the DPS Maintenance Department at 2011 Hamlin Rd., Durham, NC, or other location designated by Durham Public Schools. A copy of the signed transmittal showing delivery of stock materials took place is to be included in the warranty closeout binder.
9. An As-Built Survey showing "line and grade" is required to be submitted and approved by the civil engineer for all site work, site utilities and buildings installed under this contract.
10. All keys listed below shall be turned over to the owner in one submission package accompanied by a signed itemized transmittal identifying the contents of the submission. A copy of the signed transmittal is to be included in the warranty closeout binder along with the hardware suppliers "key letter" sent to the owner under separate cover when the door hardware keys were sent.
 - a. Door hardware keys in a key box (sent directly to DPS by the hardware supplier with separate transmittals)
 - b. Kitchen equipment keys
 - c. Walk-in cooler & freezer keys
 - d. Roll up door & grill keys

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- e. Elevator keys
- f. Electrical panel keys – two (2) per panel
- g. HVAC controls panel keys
- h. Fire alarm panel keys - two (2) per panel
- i. Security alarm panel keys
- j. Sound system cabinet keys
- k. Hose bib / wall hydrant keys - two (2) per hose bib / wall / hydrant
- l. Classroom teacher’s cabinet keys – two (2) per lockable cabinet
- m. Generator Keys
- n. Press Box / Announcer’s Box Keys – 2 minimum
- o. Fire Alarm Device Keys – two (2) per device
- p. Access Panel door keys

1.10 CLOSEOUT DOCUMENTATION ORGANIZATION

A. Instructions for Closeout Binders

1. DPS will provide a Pdf or Microsoft Word and Excel files to the contractor for each project with the format information for the three ringed **Warranty Binders and O & M Binders**. The Prime contractor(s) will prepare (1) identical Warranty/Closeout binders and (1) identical sets of O&M binders with original documents in each binder.

There will be a **minimum of 1 binder total** (1 each for Warranty / Closeout and 1 each for O&M with original documents) submit one (1) to the Engineer for review and forwarded to GCS if acceptable. The fourth copy of the binders is to be kept by the contractor as a back-up set, in case the originals are lost in transit between offices.

A table of contents and corresponding numbered divider tabs will be included and MUST be utilized to identify and separate the contents. If the table of contents and numbered tabs are not utilized, the manuals will not be reviewed and will be rejected.

2. The Warranty and O&M table of contents was taken directly from the Specifications, if any of the items listed do not apply (have been deleted/changed by change order **insert an “exception sheet” behind the corresponding numbered tab** (samples attached) with the following information:

- a. Item that was changed, deleted or not required with a signature block for the contractor.

Note: DO NOT leave a blank space behind a tab. If the information is located somewhere else put a copy of it behind the appropriate tab or put a sheet behind the tab stating exactly where the information is located (i.e. “Product data is included on the shop drawing.”).

3. Operation and Maintenance manuals must have operation and maintenance instructions. Submittals are not acceptable replacements for operation and maintenance instructions.

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If submittals are submitted instead of O&M information the manuals will not be reviewed and will be rejected. Operation and Maintenance manuals **must also contain** copies of approved **Submittal Product Data and Shop Drawings**. **Shop Drawings should be numbered with the appropriate spec section number, compiled in spec section order and submitted as a rolled up drawing set with the O & M manuals. Small format shop drawings (i.e. 11 X 17 and smaller) should be 3-hole punched and placed in the O&M binder behind the appropriate tab.**

Where multiple O & M Binders are required to complete a single set, indicate the Volume # of the set # (IE. Volume 1 of 2), and the Tab #s included in each binder (IE. Tabs 1 thru 25).

The Engineer is to ensure that there are no blank tabs in the binders before forwarding them to GCS.

4. Provide following information on the cover and spine of each manual:

Name of School or Project

Name of the Manual, i.e., **Warranty & Closeout Manual** or **O&M Manual**.

Contractor's Name

Contract Type i.e. **General Prime Contract (if multi-prime project) or Single Prime Contract**

Name of Engineer/Engineer

Date of substantial completion

Volume _____ of _____

Tabs _____ Thru _____

B. Instructions for Digital Closeouts

All closeout documentation shall be submitted in electronic format unless noted otherwise. The information is to be organized using Window Explorer folder system as outlined below:

1. Folder #1 titled "Certificates and Approvals"
 - a. Project Contact List (all participants including contractors, subcontractors, suppliers, etc.)
 - b. Letters from contractor requesting substantial and final inspections
 - c. Certificate of Occupancy by local AHJ
 - d. Required approvals from other agencies

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- e. Certificate of Substantial Completion
 - f. Certificate of Final Completion
 - g. Punchlist(s)
 - h. Contractor letter stating no asbestos-containing materials were used in the construction of the project.
 - i. Any other documentation requested by the owner.
2. Folder #2 titled "Warranty Manual"
- a. Contractor's General Warranty
 - b. Manufacturers / Installer / Equipment and System Warranties
3. Folder #3 titled "Submittal Documents"
- a. All final approved shop drawings submittals organized in CSI Masterformat
 - b. Documentation of all manufacturer / material color and finish selections (by schedule or location)
4. Folder #4 titled "O&M Manual": Requirements are outlined in the Project Manual
5. Folder #5 titled "Record Drawings and Project Manual"
- a. PDF files of all final drawings
 - b. PDF of Project Manual
 - c. Electronic CAD files of all drawings in format acceptable to the Owner
 - d. PDF of Bid Addendum
 - e. Scanned PDF set of field marked up as-built drawings.

PART 2- PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

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PART 3- EXECUTION

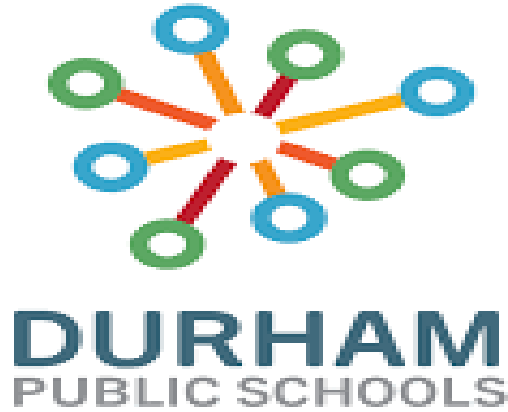
3.1 FINAL CLEANING

- A. General: Provide final cleaning. Final Cleaning is the responsibility of the General Contractor. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits
 - b. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - c. Remove snow and ice to provide for safe access to facility. Continue providing this service until substantial completion has been achieved.
 - d. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults / closets, manholes, attics, mezzanines and similar spaces.
 - e. Sweep concrete floors broom clean with sweeping compound.
 - f. Vacuum carpet and similar soft surfaces, removing debris and excess nap; have carpets professionally shampooed / cleaned if visible soil or stains remain.
 - g. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision obscuring materials. Replace chipped or broken glass and other materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - h. Remove labels that are not permanent.
 - i. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - j. Remove any paint from "UL" and similar labels, including mechanical and electrical nameplates.
 - k. Wipe surfaces of mechanical and electrical equipment, elevator equipment and similar equipment. Remove excess lubrication, paint and mortar drippings, and other foreign substances.
 - l. Replace parts subject to unusual operating conditions.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains from water exposure.

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- n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of all diffusers, registers and grilles.
 - o. Clean ducts, blowers and coils.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned out bulbs, and those noticeably dimmed by hours of use, and defective and / or noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - q. GC to be responsible for professional final cleaning of the interior of the building to include six (6) coats of wax on all VCT or hard surface flooring.
 - r. All fixtures to be wiped clean. Food Service equipment to be cleaned. The GC warrants that it will provide the facility in a “white glove test” condition to the Owner.
 - s. GC to be responsible for final cleaning of building exterior to include windows and all horizontal and vertical surfaces.
 - t. GC to pressure wash all exterior hard surfaces.
 - u. GC to provide the same cleaning as listed herein for adjacent spaces that have been effected by the construction process.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Durham Public Schools' property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.
- C. Pest Control: Engage an experience, licensed exterminator to make a final inspection and rid Project of any rodents, insects, and other pests. Exterminator to provide a written report to Owner prior to Substantial Completion being awarded.
- D. The following quantities of extra materials are part of the project base bid and shall be turned over to the owner at the end of the project. Additional items listed in various specification sections are also required to be turned over to the owner at the end of the project.

END OF SECTION 01 77 00



**LAKEVIEW SCHOOL CONTROLS
REPLACEMENT
OPERATION & MAINTENANCE MANUAL
SINGLE PRIME CONTRACTOR**

Insert Contractor Name Here.

Engineer: Dewberry Engineers Inc.

Date of Substantial Completion: _____

Volume _____ of _____

Tabs _____ thru _____



**SINGLE PRIME
CONTRACTOR**

**SINGLE PRIME
CONTRACTOR**

**SINGLE PRIME
CONTRACTOR**

XYZ, INC.

XYZ, INC.

XYZ, INC.

**OPERATIONS
&
MAINTENANCE
MANUAL**

**OPERATIONS
&
MAINTENANCE
MANUAL**

**OPERATIONS
&
MAINTENANCE
MANUAL**

**DPS LAKEVIEW
SCHOOL
CONTROLS
REPLACEMENT**

**DPS LAKEVIEW
SCHOOL
CONTROLS
REPLACEMENT**

**DPS LAKEVIEW
SCHOOL
CONTROLS
REPLACEMENT**

**Substantial Completion
Date:**

**Substantial Completion
Date:**

**Substantial Completion
Date:**

Volume ____ of ____

Volume ____ of ____

Volume ____ of ____

Tabs ____ thru ____

Tabs ____ thru ____

Tabs ____ thru ____

Example - Operations & Maintenance Index

XYZ Middle School - Addition & Renovation

Tab #	Spec Section	Title	As-Builts	O & M	Product Data	Shop Drawings
1	02361	Termite Control			x	
2	02510	Water Distribution				
		Valve & Accessories		x	x	
		Water Meters & Accessories			x	
		Backflow Preventers and Assemblies			x	
		Fire Hydrants			x	
		Fire Dept. Connections			x	
		Protective Enclosures				
3	02530	Sanitary Sewage System - Piping			x	
4	02620	Subdrainage			x	
5	02630	Storm Drainage				
		Special Pipe Fittings			x	
		Backwater Valves			x	
		Drains			x	
		Channel Drainage System			x	
		Storage & Leaching Chambers			x	
		Manholes			x	x
		Catch Basins			x	x
		Stormwater Detention			x	x
6	02741	Hot Mix Asphalt Paving			x	
7	02751	Cement Concrete Pavement			x	
8	02764	Pavement Joint Sealants			x	
9	02794	Synthetic Grass Surfacing		x	x	x
10	02795	Reinforced Grass Paving			x	
11	02540	Running Track Surfaces		x	x	x
12	02810	Irrigation System		x		x
		Sprinkler Heads			x	
		Valves: Manual and Automatic			x	
		Controllers			x	
		Valve Boxes			x	
		Pipe & Fittings			x	
		Wire & Connectors			x	
		Quick Coupling Valves			x	
		Rain Sensors			x	
		Grounding Equipment			x	
		Air Vacuum/ Relief Valves			x	
		Miscellaneous Materials			x	
13	02812	Irrigation Pump System		x		
		Centrifugal Pump			x	
		VFD Drive			x	
		Control Panel			x	

XYZ Middle School - Addition & Renovation

Tab #	Spec Section	Title	As-Builts	O & M	Product Data	Shop Drawings
		Flow Switch			x	
		Pressure Switch			x	
		Check Valve			x	
		Gate Valve			x	
		Pipe & Fittings			x	
		Level Sensors			x	
14	02821	Chain Link Fences & Gates			x	
15	02832	Segmental Retaining Walls			x	x
16	02881	Outdoor Athletic Equipment			x	x
17	02920	Seeding			x	
18	02925	Sprigging			x	
19	02930	Exterior Plants			x	
20	03300	Cast In Place Concrete			x	
21	03410	Structural Precast Concrete - Plant Cast			x	x
22	03451	Plant Precast Architectural Concrete Wall Units			x	x
23	04810	Unit Masonry			x	
24	05120	Structural Steel			x	x
25	05210	Steel Joist			x	x
26	05310	Steel Deck			x	x
27	05500	Metal Fabrications				x
28	05511	Metal Stairs				x
29	05513	Alternating Tread Metal Stairs				x
30	05521	Pipe & Tube Railings				x
31	05811	Architectural Joint Systems			x	x
32	06402	Interior Architectural Woodwork			x	x
33	06420	Paneling			x	x
34	07115	Bituminous Dampproofing			x	
35	07170	Bentonite Waterproofing			x	x
36	07210	Building Insulation			x	
37	07331	Roof Garden System		x	x	
38	07411	Metal Roof Panels			x	x
39	07412	Metal Wall Panels		x	x	x
40	07552	SBS Modified Bituminous Membrane Roofing		x	x	x
41	07620	Sheet Metal Flashing & Trim			x	x
42	07716	Roof Expansion Assemblies			x	x
43	07720	Roof Accessories			x	x
44	07811	Sprayed Fire Resistive Materials			x	
45	07841	Through Penetration Firestop Systems			x	
46	07842	Fire Resistive Joint Systems			x	
47	07920	Joint Sealants			x	
48	08111	Standard Steel Doors & Frames			x	x
49	08211	Flush Wood Doors			x	x
50	08331	Overhead Coiling Service Doors			x	x

XYZ Middle School - Addition & Renovation

Tab #	Spec Section	Title	As-Builts	O & M	Product Data	Shop Drawings
51	08332	Overhead Coiling Counter Doors			x	x
52	08411	Aluminum Framed Entrances & Storefronts			x	x
53	08520	Aluminum Windows			x	x
54	08711	Door Hardware			x	
55	08800	Glazing			x	
56	08911	Glazed Aluminum Curtain Walls			x	x
57	09220	Portland Cement Plaster			x	
58	09310	Ceramic Tile			x	
59	09511	Acoustical Panel Ceilings			x	
60	09622	Resilient Sports Floor Covering		x	x	
61	09641	Wood Stage Floor		x	x	
62	09642	Wood Stage Floor Assemblies			x	
63	09651	Resilient Floor Tile			x	
64	09653	Resilient Wall Base & Accessories			x	
65	09680	Carpet		x	x	
66	09771	Fabric Banners			x	
67	09841	Acoustical Wall Panels		x	x	x
68	09912	Painting			x	
69	09960	High Performance Coatings			x	
70	10101	Visual Display Surfaces			x	
71	10125	Bulletin Boards & Display Cases			x	
72	10155	Toilet Compartments			x	x
73	10190	Cubicles			x	
74	10200	Louvers and Vents			x	x
75	10350	Flagpoles			x	x
76	10431	Signs			x	x
77	10505	Metal Lockers		x	x	x
78	10520	Fire Protection Specialties			x	
79	10671	Metalk Storage Shelving			x	
80	10675	Prefabricated Wood Storage Shelving			x	x
81	10801	Toilet and Bath Accessories			x	
82	10900	Miscellaneous Specialties			x	
83	11050	Library Casework and Equipment			x	x
84	11062	Folding and Portable Stage		x	x	x
85	11063	Stage Curtains		x	x	
86	11067	Sound Reflector Panels			x	x
87	11132	Projection Screens			x	
88	11400	Food Service Equipment		x	x	x
89	11451	Residential Appliances		x	x	
90	11490	Gymnasium Equipment		x	x	x
91	11610	Laboratory Fume Hoods		x	x	x
92	12351	Music Instrument Storage Casework			x	x
93	12355	Institutional Casework			x	x

XYZ Middle School - Addition & Renovation

Tab #	Spec Section	Title	As-Builts	O & M	Product Data	Shop Drawings
94	12362	Wood Laboratory Casework			x	x
95	12491	Horizontal Louver Blinds			x	x
96	12610	Fixed Audience Seating			x	x
97	12660	Telescoping Stands		x	x	x
98	13126	Grandstands		x	x	x
99	13915	Fire Suppression Piping	x	x	x	x
100	13921	Electric Driven Antifugal Fire Pump		x	x	x
101	14240	Hydraulic Elevators		x	x	x
102	15055	Motors		x	x	
103	15071	Mechanical Vibration & Siesmic Controls			x	x
104	15080	Mechanical Insulation			x	
105	15110	Valves			x	
106	15122	Meters and Gages			x	x
107	15140	Domestic Water Piping			x	
108	15150	Sanitary Waste and Vent Piping			x	
109	15181	Hydronic Piping			x	
110	15185	Hydronic Pumps			x	
111	15194	Fuel Gas Piping			x	
112	15221	Chemical Waste Piping		x	x	
113	15410	Plumbing Fixtures		x	x	
114	15412	Emergency Plumbing Fixtures		x	x	
115	15415	Drinking Fountains & Water Coolers		x	x	
116	15430	Plumbing Specialties				
		Backflow Preventers and Water Regulators		x	x	
		Balancing valves, water filters & strainers		x	x	
		Thermostatic water mixing valves & water tempering valves		x	x	
		Water hammer arresters, air vents & trap seal primer valves & systems			x	
		Drain valves, hose bibbs, hydrants & hose stations		x	x	
		Outlet boxes and washer supply outlets			x	
		Backwater valves, cleanouts, floor drains, open receptors, trench drains & roof drains			x	
		Air-admittance valves, vent caps, vent terminals & roof flashing assemblies			x	
		Grease Interceptors		x	x	x
		Sleeve penetration systems			x	
		Trap seal primer valves & systems		x	x	
117	15441	Domestic Water Pumps		x	x	x
118	15450	Potable Water Storage Tanks			x	
119	15486	Fuel-Fired Water Heaters		x	x	x
120	15513	Condensing Boilers		x	x	x
121	15550	Breechings, Chimneys & Stacks			x	x
122	15622	Thermal Storage		x	x	x
123	15626	Rotary Screw Water Chillers		x	x	x

XYZ Middle School - Addition & Renovation

Tab #	Spec Section	Title	As-Builts	O & M	Product Data	Shop Drawings
124	15635	Refrigerant Monitoring & Safety Equipment		x	x	x
125	15641	Open-Circuit, Mechanical Draft Cooling Tower		x	x	x
126	15725	Modular Indoor Air Handling Units		x	x	x
127	15732	Rooftop Air Conditioning Units		x	x	x
128	15738	Split System Air Conditioning Unit		x	x	
129	15756	Plate and Frame Heat Exchangers		x	x	x
130	15767	Propeller Unit Heaters		x	x	
131	15785	Air to Air Energy Recovery Units			x	
132	15815	Metal Ducts				x
133	15816	Fabric Ducts			x	
134	15820	Duct Accessories				
		Backdraft dampers			x	
		Volume dampers			x	
		Motorized control dampers		x	x	
		Fire dampers			x	
		Duct silencers			x	
		Turning vanes			x	
		Duct mounting access doors			x	
		Flexible connectors			x	
		Flexible ducts			x	
135	15840	Air Terminal Units		x	x	
136	15855	Diffusers, Registers and Grilles			x	
137	15900	HVAC Instrumentation and Controls	x	x	x	x
138	16060	Grounding and Bonding			x	x
139	16072	Electrical Supports and Seismic Restraints			x	x
140	16075	Electrical Identification			x	
141	16120	Conductors and Cable			x	
142	16130	Raceways and Boxes			x	
143	16139	Cable Trays			x	x
144	16140	Wiring Devices			x	
145	16145	Lighting Control Devices			x	
146	16231	Packaged Engine Generators		x	x	x
147	16269	Variable Frequency Controllers			x	x
148	16289	Transient Voltage Suppression			x	
149	16410	Enclosed Switches and Circuit Breakers			x	
150	16415	Transfer Switches			x	
151	16420	Enclosed Controllers			x	
152	16441	Switchboards			x	
153	16442	Panelboards			x	
154	16461	Dry Type Transformers			x	
155	16491	Fuses			x	
156	16511	Interior Lighting		x	x	
157	16555	Stage Lighting		x	x	x

Closeout Requirements

DPS Lakeview School Controls Replacement
3507 Dearborn Dr, Durham, NC 27704

Contractor: **[Insert Contractor]**

Substantial Completion Date: **[Insert Substantial Completion Date]**

The following documents must be completed and submitted by each prime contractor. Documents shall be submitted to the Architect in a single package with this (completed) checklist attached. The Architect must receive all documents before the Contractor's Final Application for Payment can be reviewed.

- _____ 1. *Final Application for Payment (with Continuation Sheets & Tax Reports)
- _____ 2. *Executed Certificate of substantial Completion with punch list attached.
- _____ 3. *Contractor's Affidavit of Payment of Debts and Claims (fully executed – AIA Form G706)
- _____ 4. *Contractor's Affidavit of Release of Liens (fully executed – AIA Form G 706A)
- _____ 5. *Release of liens by subcontractors and/or vendors (fully executed – when required)
- _____ 6. *Consent of Surety to Final Payment (AIA G707)
- _____ 7. Certificate of Occupancy from proper municipality
- _____ 8. Contractor's One-Year Warranty (notarized)
- _____ 9. Warranty summary sheet and original warranties for specific items (roof, motors, etc.)
- _____ 10. Certification letter from Contractor stating that no asbestos containing materials were used.
- _____ 11. Final list of all subcontractors with names, addresses, and phone numbers
- _____ 12. Record Drawings and cover letter indicating that they have been reviewed and are as accurate and complete as possible.
- _____ 13. Certified Testing and Balancing Report for HVAC System with cover letter indicating it has been reviewed and approved by consulting Engineer.

*** Provide directly to Architect (Attn: Director of Bidding and Contract Services). Do not include in O&M manuals.**

All remaining items shall be directed to the Architect's Construction Administrator.

Contractor's Signature

Date

Architect/Engineer's Signature

Date

DPS Close-out Manager's Signature

Date

WARRANTIES

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

.2 SUMMARY

- A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.
 - 1. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Submittals" specifies procedures for submitting warranties.
 - 2. Division 1 Section "Closeout Procedures" specifies contract closeout procedures.
 - 3. Divisions 2 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.
 - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

.3 DEFINITIONS

- A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

.4 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

WARRANTIES

- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.
 - 1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

.5 SUBMITTALS

- A. Submit written warranties in Portable Document Format (PDF) to the Program Manager prior to the date certified for Substantial Completion. If the Program Manager's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Program Manager. Note that the warranty period does not commence until Certificate of Substantial Completion has been issued for the project.
 - 1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Program Manager within 15 days of completion of that designated portion of the Work.
- B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Program Manager, for approval prior to final execution.
 - 1. Refer to Divisions 2 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

WARRANTIES

2. Provide 1 hard copies, and 1 electronic copy in Portable Document Format (PDF), of all closeout documents to Engineer for distribution to Owner. This includes O & M Manuals, Project Documents, As-Built Drawings, Approvals, Certificates, and all warranty information. PDF is to be verified as fully searchable and Indexed by spec section number, or by plan section and page number for drawings, and the index shall be fully linked with the document pages.

.6 O & M BINDERS

1. Bind O & M Data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual. Utilize the format of the attached O & M index at the end of this section.
2. Provide heavy duty dividers with pre-numbered plastic coated tabs for each separate Maintenance Manual. Provide a typed description of the product or installation on the index (see example at the end of this section). Include the spec section number, name of the product, and the name, address, and telephone number of the Installer on the Contractor and Supplier List at the front of the O & M binder.
3. Identify each binder on the front and spine with the typed or printed title "Operations & Maintenance," Project title or name, and name of the Contractor. Use the spine & cover sheet examples at the end of this section as templates.
4. Provide additional copies of each required warranty, as necessary, for inclusion in each related section of O & M Binder.

.7 O & M Manuals Digital

- A. Assemble one (1) digital set of operations and maintenance data indicating the operation and maintenance of each piece of equipment... Include operation and maintenance data required in individual Specification Sections and as follows:
 1. Maintenance Data:
 - a. Manufacturers information, including list of spare parts
 - b. Name, address, and telephone number of Installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventive and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of maintenance service agreements.
 - h. Copies of warranties and bonds
- B. Organize operation and maintenance manuals per Section 1.10 Closeout Document Organization.
- C. Operation and Maintenance manuals must have operation and maintenance instructions. Submittals are not acceptable replacements for operation and maintenance instructions. If submittals are submitted instead of O&M information the manuals will not be reviewed and will be rejected. Operation and Maintenance manuals **must also contain** copies of approved **Submittal Product Data and Shop Drawings**
- D. Please make sure the following conditions are adhered to:
 1. All warranties must be made out to the owner, (i.e. Durham Public Schools) and contain the project name and address.

WARRANTIES

2. All warranties must have proof of authenticity. Contractor and installer warranties must be signed originals specifying project, owner and warranty period commencing from the date of substantial completion. The document can state “from substantial completion” or give the actual Engineer certified date. Either of the following is considered acceptable for manufacturers’ warranties: An original manufacturer warranty with name of project, owner and date of substantial completion, a manufacturer warranty accompanied by an original letter from the manufacturer bearing original or electronic signatures of manufacturer, certifying the authenticity of the manufacturer’s standard warranty naming project, school, and date of substantial completion; a manufacturer’s warranty accompanied by a manufacturer’s agent original signed letter certifying the authenticity and naming project, owner and date of substantial completion. A manufacturer’s agent certification will only be considered acceptable if it is accompanied by a signed letter from the manufacturer verifying the agent has Power of Attorney or specific authority to authenticate the manufacturer’s warranty as “project specific”.
3. Check that warranties include labor where specified.
4. The Prime contractor’s corporate seal (if a corporation) is required on section 00 65 23 warranty.
5. The commencement date for all warranties is the date of substantial completion. This date shall be listed on the warranty or shall say “from the date of declared substantial completion”. A manufacturer’s warranty on equipment shall always cover the gap from early start up to the date of substantial completion. This is a part of the contract and a cost of the work.
6. Warranties cannot contain conditional clauses (such as “this warranty is not or shall not become effective until the contractor has been paid in full”).
7. **A separate training letter and associated sign in sheet are required for each owner training session.** A list of required training sessions will be included in the warranty closeout document binder.
8. Stock Materials shall be transported to the DPS Maintenance Department at 2011 Hamlin Rd., Durham, NC, or other location designated by Durham Public Schools. A copy of the signed transmittal showing delivery of stock materials took place is to be included in the warranty closeout binder.
9. An As-Built Survey showing “line and grade” is required to be submitted and approved by the civil engineer for all site work, site utilities and buildings installed under this contract.
10. All keys listed below shall be turned over to the owner in one submission package accompanied by a signed itemized transmittal identifying the contents of the submission. A copy of the signed transmittal is to be included in the warranty closeout binder along with the hardware suppliers “key letter” sent to the owner under separate cover when the door hardware keys were sent.
 - a. Door hardware keys in a key box (sent directly to DPS by the hardware supplier with separate transmittals)
 - b. Kitchen equipment keys

WARRANTIES

- c. Walk-in cooler & freezer keys
- d. Roll up door & grill keys
- e. Elevator keys
- f. Electrical panel keys – two (2) per panel
- g. HVAC controls panel keys
- h. Fire alarm panel keys - two (2) per panel
- i. Security alarm panel keys
- j. Sound system cabinet keys
- k. Hose bib / wall hydrant keys - two (2) per hose bib / wall / hydrant
- l. Classroom teacher’s cabinet keys – two (2) per lockable cabinet
- m. Generator Keys
- n. Press Box / Announcer’s Box Keys – 2 minimum
- o. Fire Alarm Device Keys – two (2) per device
- p. Access Panel door keys

.8 CLOSEOUT DOCUMENTATION ORGANIZATION

A. Instructions for Closeout Binders

1. DPS will provide a Pdf or Microsoft Word and Excel files to the contractor for each project with the format information for the three ringed **Warranty Binders and O & M Binders**. The Prime contractor(s) will prepare (1) identical Warranty/Closeout binders and (1) identical sets of O&M binders with original documents in each binder.

There will be a **minimum of 1 binder total** (1 each for Warranty / Closeout and 1 each for O&M with original documents) submit one (1) to the Engineer for review and forwarded to GCS if acceptable. The fourth copy of the binders is to be kept by the contractor as a back-up set, in case the originals are lost in transit between offices.

A table of contents and corresponding numbered divider tabs will be included and MUST be utilized to identify and separate the contents. If the table of contents and numbered tabs are not utilized, the manuals will not be reviewed and will be rejected.

2. The Warranty and O&M table of contents was taken directly from the Specifications, if any of the items listed do not apply (have been deleted/changed by change order **insert an “exception sheet” behind the corresponding numbered tab** (samples attached) with the following information:
 - a. Item that was changed, deleted or not required with a signature block for the contractor.

Note: DO NOT leave a blank space behind a tab. If the information is located somewhere else put a copy of it behind the appropriate tab or put a sheet behind the tab stating exactly where the information is located (i.e. “Product data is included on the shop drawing.”).

3. Operation and Maintenance manuals must have operation and maintenance instructions. Submittals are not acceptable replacements for operation and maintenance instructions. If submittals are submitted instead of O&M information the manuals will not be reviewed

WARRANTIES

and will be rejected. Operation and Maintenance manuals **must also contain** copies of approved **Submittal Product Data and Shop Drawings**. **Shop Drawings should be numbered with the appropriate spec section number, compiled in spec section order and submitted as a rolled up drawing set with the O & M manuals. Small format shop drawings (i.e. 11 X 17 and smaller) should be 3-hole punched and placed in the O&M binder behind the appropriate tab.**

Where multiple O & M Binders are required to complete a single set, indicate the Volume # of the set # (IE. Volume 1 of 2), and the Tab #s included in each binder (IE. Tabs 1 thru 25).

The Engineer is to ensure that there are no blank tabs in the binders before forwarding them to GCS.

4. Provide following information on the cover and spine of each manual:

Name of School or Project
Name of the Manual, i.e., **Warranty & Closeout Manual** or **O&M Manual**.
Contractor's Name
Contract Type i.e. **General Prime Contract (if multi-prime project) or Single Prime Contract**
Name of Engineer/Engineer
Date of substantial completion
Volume _____ of _____
Tabs _____ Thru _____

B. Instructions for Digital Closeouts

All closeout documentation shall be submitted in electronic format unless noted otherwise. The information is to be organized using Window Explorer folder system as outlined below:

1. Folder #1 titled "Certificates and Approvals"
 - a. Project Contact List (all participants including contractors, subcontractors, suppliers, etc.)
 - b. Letters from contractor requesting substantial and final inspections
 - c. Certificate of Occupancy by local AHJ
 - d. Required approvals from other agencies
 - e. Certificate of Substantial Completion
 - f. Certificate of Final Completion
 - g. Punchlist(s)

WARRANTIES

- h. Contractor letter stating no asbestos-containing materials were used in the construction of the project.
- i. Any other documentation requested by the owner.
- 2. Folder #2 titled "Warranty Manual"
 - a. Contractor's General Warranty
 - b. Manufacturers / Installer / Equipment and System Warranties
- 3. Folder #3 titled "Submittal Documents"
 - a. All final approved shop drawings submittals organized in CSI Masterformat
 - b. Documentation of all manufacturer / material color and finish selections (by schedule or location)
- 4. Folder #4 titled "O&M Manual": Requirements are outlined in the Project Manual
- 5. Folder #5 titled "Record Drawings and Project Manual"
 - a. PDF files of all final drawings
 - b. PDF of Project Manual
 - c. Electronic CAD files of all drawings in format acceptable to the Owner
 - d. PDF of Bid Addendum
 - e. Scanned PDF set of field marked up as-built drawings.

Exception to Contract Documents

For use when a work item identified in the DPS provided Warranty and O&M Binders are deleted from the project or changed and recorded by change order.

Name of Project: _____

Specification Section: _____

WARRANTIES

- The product data and submittal information
- O&M Manuals;
- Warranty;
- Shop Drawings were not required for this specification section as a result of a change order:

_____ dated _____.

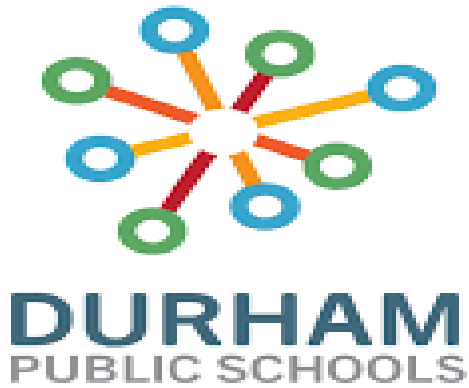
Name,
Project Manager, (Company Name)
Contractor

Name
Construction Administrator, (Company Name)
Architect

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 78 36



Lakeview School Controls Replacement

WARRANTY/ CLOSEOUT MANUAL

SINGLE PRIME CONTRACTOR

XYZ Construction, Inc.

Engineer: Dewberry Engineers Inc.

Date of Substantial Completion: _____

Volume _____ of _____

Tabs _____ thru _____



**SINGLE PRIME
CONTRACTOR**

**SINGLE PRIME
CONTRACTOR**

**SINGLE PRIME
CONTRACTOR**

XYZ, INC.

XYZ, INC.

XYZ, INC.

**CLOSEOUT/
WARRANTY
MANUAL**

**CLOSEOUT/
WARRANTY
MANUAL**

**CLOSEOUT/
WARRANTY
MANUAL**

**DPS LAKEVIEW
SCHOOL
CONTROLS
REPLACEMENT**

**DPS LAKEVIEW
SCHOOL
CONTROLS
REPLACEMENT**

**DPS LAKEVIEW
SCHOOL
CONTROLS
REPLACEMENT**

**Substantial Completion
Date:**

**Substantial Completion
Date:**

**Substantial Completion
Date:**

Volume ___ of ___

Volume ___ of ___

Volume ___ of ___

Tabs ___ thru ___

Tabs ___ thru ___

Tabs ___ thru ___

Section 01740
Warranty Index

Example - Warranty & Closeout Index
XYZ Middle School - Addition & Renovation

Date of Substantial Completion

Tab #	Spec Section	Title	Warranty Period
1		Cover Page	
2		Table of Contents	
3		Audit - Table of Contents	
4		Certificate of Substantial Completion	
5		Certificate of Occupancy	
6		Contractor and Supplier List	
7		Contractor's General Warranty on Letterhead	
8	00 6900	Contractor's General Warranty	1 year / 2 year Leaks
9	00 6910	Asbestos Free Warranty	
10	00 6920	Final Certificate & Release	
11	00 6930	Roofing System Warranty	5 year material 2 year labor
12	00 6940	Sealant Work Warranty	15 year
13	00 6950	Insulating Glass Replacement Labor Warranty	10 year
14	01 7400	Roofing Service Agreement	2 year
15	07 1326	Sheet Waterproofing	5 year material
16	07 5300	Membrane Roofing	15 Year
17	08 1429	Wood Doors	2 year labor
18	08 4113	Storefronts	2 year
19	08 4413	Curtainwalls	2 year
20	08 7100	Hardware	10 year
21	08 8000	Glazing	10 year
22	09 6816	Carpeting	Lifetime
23	10 1100	Display Cases	Lifetime
24	10 1426	Post and Panel Signs	5 year
25	10 2115	Toilet Compartments	15 year
26	10 2813	Toilet Accessories	15 year
27	10 5526	Parcel Lockers	10 year
28	23 8119	AC Units	5 year compressor
		Full Maintenance	1 year
29	26 4010	TVSS System	5 year
30	26 7020	FA System	2 year
31	31 3000	Termite Control	3 year

Section 01740

Tab #	Spec Section	Title	Warranty Period

Section 01740

Tab #	Spec Section	Title	Warranty Period
		CERTIFICATIONS, LETTERS & TEST REPORTS	
		<i>(Tab numbering shall be continuous following all Special Warranties)</i>	
32		Key Letter and Transmittal	
33		Stock Materials Letter and Transmittal	
34		Bus Lot Information	
35		Elevator Inspection Report	
36		Domestic Back Flow Preventer Test and Maintenance Report	
37		Fire Sprinkler Back Flow Preventer Test and Maintenance Report	
38		Fire Retardant Treatment Log	
39		Other Specified Training Letters / Sign-In Sheets	
40		Kitchen Equipment Index (item #, Qty, Mfr, Serial #, Cost)	
41		Valve Tag Listing - Mechanical	
42		NCDOL Boiler Test Report	
43		Kitchen Hood Suppressions System Test Report	
44		Chiller Test and Certification Report	
45		Controls Test and Certification Report	
46		Valve Tag Listing - Plumbing	
47		Certification of Sterilization of Potable Water	
48		Fire Sprinkler Inspection Report	
49		UL Certification for Lightning Protection	
50		Theatrical Lighting Instruction Sign-In Sheet	
51		Transformer Voltage Test Reports	
52		Lightning Rod Resistance Test	
53		Ground Resistance Test	
54		Ground / Neutral Isolation Test	
55		Receptacle Test	
56		Generator Set / ATS instruction Sign-In Sheet	
57		Generator Set Load Test Report	
58		Fire Alarm System Instruction Sign-In Sheet	
59		Fire Alarm Documentation (cert. form, written statement)	
60		Fire Alarm Test Reports	
61		Intercom System Instruction Sign-In Sheet	
62		Intercom System Test Reports	
63		Security Cabling Test Reports	
64		600 Volt Cable Test Reports	
65		CCTV Testing and Training Sign-In Sheet	
66		Security Camera Testing and Training Sign-In Sheet	

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Tab #	Spec Section	Title	Warranty Period
		FINAL APPLICATION FOR PAYMENT	
67	00 62 76	Pay Application Cover Sheet	
68		Application for Payment (AIA G702)	
69		Continuation Sheet (AIA G703)	
70		Sales Tax Statement - for Period	
71		MBE Appendix E - for Period	
72		Sales Tax Statement - Total for Project	
73		MBE Appendix E - Total for Project	
74		Payment of Debts (AIA G706)	
75		Release of Liens (AIA G706A)	
76		Consent of Surety (AIA G707)	
		ARCHITECTS LETTERS	
77		Red Lined As-Built Received & Acceptable	
78		Punchlist Completed	
79		Stock Material Delivery Receipt	
80		A/E Certification for NCDENR Water and Sewer	
81		As-Built Survey Received	
82		T & B and Commissioning Items Completed	

Section 01740
Warranty Index

DEMONSTRATION AND TRAINING

DPS Lakeview School Controls Replacement

PART 1 - GENERAL

1.1 Summary

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 1. Demonstration of operation of systems, subsystems, and equipment.
 2. Training in operation and maintenance of systems, subsystems, and equipment.
 3. Demonstration and training videotapes.

1.2 Coordination

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

PART 2 - PRODUCTS

2.1 Instruction Program

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
 1. Heat generation, including boilers, pumps, and water distribution piping.
 2. Refrigeration systems, including chillers, pumps, and distribution piping.
 3. HVAC systems, including air-handling equipment, air distribution systems, and terminal equipment and devices.
 4. HVAC instrumentation and controls.
 5. Electrical service and distribution, including transformers, switchboards, panel boards, and motor controls.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project Record Documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 3. Emergencies: Include the following, as applicable:

DEMONSTRATION AND TRAINING

- a. Instructions on meaning of warnings, trouble indications, and error messages.
- b. Instructions on stopping.
- c. Shutdown instructions for each type of emergency.
- d. Operating instructions for conditions outside of normal operating limits.
- e. Sequences for electric or electronic systems.
- f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 Preparation

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

DEMONSTRATION AND TRAINING

- B. Set up instructional equipment at instruction location.
- C. Provide copies of sign-in sheets for all training sessions.

3.2 Instruction

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner with at least seven days' advance notice.
- C. Demonstration and Training: During instruction, start and demonstrate each piece of equipment, not just each type of equipment, to ensure proper operation and working condition of equipment.
- D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.
- E. Video each training session and provide 3 copies of each video to the owner for their reference and use.

END OF SECTION 01 79 00

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SECTION 23 05 11 – HVAC ELECTRICAL PROVISIONS

PART 1 - GENERAL

1.1. SUMMARY

- A. This section includes electrical equipment, materials and work that are the responsibility of Division 23.

1.2. ACTION SUBMITTALS

- A. Product Data: For each type of device, include dimensions, mounting arrangements, location for conduit entries, shipping and operating weights, and manufacturer's technical data on features, performance, electrical ratings, characteristics, and finishes.
- B. Electrical Connections: Submitted equipment nameplates shall be coordinated with the indicated design electrical characteristics. If the submitted equipment requires changes to the electrical connection(s) (including conduit, wire, circuit breaker, fuse, starter, and disconnect sizes, connection locations, etc.) comply with the requirements of Section 230100. Any changes required to accommodate the equipment shall be responsibility of the contractor.
 - 1. Proposed changes to the design shall be submitted to the Engineer for review and approval.
 - 2. Accepted changes shall be noted by the contractor on the as-built documentation.

1.3. CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For disconnects, motor starters and combination motor starters and disconnects, to include in emergency, operation and maintenance manuals.

1.4. QUALITY ASSURANCE

- A. Source Limitations: Obtain motor starters, disconnect switches and combination motor starters and disconnect switches of a single type through one source from a single manufacturer.
 - 1. Exceptions: Disconnect switches that are factory-mounted to HVAC equipment may be provided by the equipment manufacturer.
- B. Electrical Components, Devices, and Accessories: UL listed and labeled and complying with NFPA 70 and Division 26.
 - 1. Where requirements of Division 23, Division 26 or NFPA 70 conflict, conform to the strictest requirements.

1.5. MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

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1. Fuses: One set for each fused device.

PART 2 - PRODUCTS

2.1. EQUIPMENT ENCLOSURES

- A. Provide NEMA-rated equipment enclosures for all disconnect switches, motor starters, control panels, variable speed controllers and other similar electrical equipment. When not otherwise indicated, provide enclosures based on the environments of the installations.
 1. Inside, Clean Spaces without Water Piping: NEMA 1.
 2. Inside, Utility Spaces and Spaces with Water Piping: NEMA 12.
 3. Outside, Normal Ambient Conditions: NEMA 3R.
 4. Inside or Outside, Manholes, Tunnels and Sumps: NEMA 6
 5. Inside or Outside, NEC Hazard Class 1 Locations: NEMA 8
 6. Inside or Outside, NEC Hazard Class 2 Locations: NEMA 9

2.2. DISCONNECT SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Eaton
 2. Emerson
 3. Hubbell
 4. General Electric
 5. Rockwell Automation/Allen Bradley
 6. Schneider Electric/Square D
 7. Siemens
- B. Fusible Disconnect Switches: Single-throw, heavy-duty, service-rated fusible switch, rated for 200 to 600Vac and labeled and listed UL 98 and NEMA KS 1, Type HD with silver-tungsten type fuse clips and equipment ground and neutral kit. When a neutral is not necessary, bond the neutral bus to the enclosure for use as grounding bus. Internal current-carrying components shall be solid copper. Provide auxiliary contacts when needed for control system interface.
- C. Non-Fusible Disconnect Switches: Single-throw, heavy-duty, service-rated switch, rated for 200 to 600Vac and labeled and listed UL 98 and NEMA KS 1, Type HD with equipment ground and neutral kit. When a neutral is not necessary, bond the neutral bus to the enclosure for use as grounding bus. Internal current-carrying components shall be solid copper. Provide auxiliary contacts when needed for control system interface.
- D. Provide switch accessories required to meet the system requirements indicated.

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2.3. MOTOR STARTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Eaton
 - 2. Emerson
 - 3. Hubbell
 - 4. General Electric
 - 5. Rockwell Automation/Allen Bradley
 - 6. Schneider Electric/Square D
 - 7. Siemens
- B. Description: Full-voltage, electrically-held, non-reversing, magnetic motor controllers with 24Vac control circuit, hand-off-auto (HOA) switch, push-to-start switch, manual reset switch, auxiliary control and monitoring contacts and accessories required to meet the system requirements indicated. Cover door shall have red and green pilot lights. The green light shall illuminate when “on”, and red shall illuminated when “off”.

2.4. COMBINATION MOTOR STARTERS AND DISCONNECT SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Eaton
 - 2. Emerson
 - 3. Hubbell
 - 4. General Electric
 - 5. Rockwell Automation/Allen Bradley
 - 6. Schneider Electric/Square D
 - 7. Siemens
- B. Description: Combination magnetic motor starter and circuit breaker disconnecting means with auxiliary contacts.
 - 1. Motor Starter: Full-voltage, electrically-held, non-reversing, magnetic motor controllers with 24Vac control circuit, hand-off-auto (HOA) switch, push-to-start switch, manual reset switch, auxiliary control and monitoring contacts and accessories required to meet the system requirements indicated. Cover door shall have red and green pilot lights. The green light shall illuminated when “on”, and red shall illuminated when “off”.
 - 2. Disconnecting Means: Thermal magnetic type molded-case circuit breaker (MCCB) with adjustable instantaneous-trip for each pole, auxiliary control and monitoring contacts and test trip button.

2.5. MANUAL MOTOR SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:

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1. Eaton
 2. Emerson
 3. Hubbell
 4. General Electric
 5. Rockwell Automation/Allen Bradley
 6. Schneider Electric/Square D
 7. Siemens
- B. Description: Manual motor starter and disconnect switch with thermal overload protection for fractional horsepower motors. Toggle switch shall provide manual “on/off” control of one or two-pole single-phase motors rated up to 1 horsepower. The enclosure shall have green pilot light. The green light shall illuminate when “on”. The switch shall have a hand guard to prevent accidental operation and provisions for a padlock in the “off” position. The switch shall be rated for single or two-speed applications as indicated. The enclosure shall be for flush wall-mounting where possible and surface wall-mounting where not.

2.6. FUSES

Description: Non-renewable cartridge fuses of the type and size required by NFPA 70.

2.7. SHORT-CIRCUIT CURRENT RATINGS

- A. Overcurrent protection devices shall be rated for 65,000 AIC.

2.8. POWER AND CONTROL CABLING AND RACEWAY

- A. Low-Voltage (100 to 600 V) Power Feeders: Size conductors and raceway per NFPA 70 based on equipment nameplate requirements and manufacturer’s installation recommendations.
- B. Control-Voltage (Up to 24 V) Cabling: Provide control cabling for HVAC system per NFPA 70 based on the system manufacturer’s installation recommendations.
1. Paired Cabling: No. 16 AWG Type CMP plenum-rated twisted pair.
 2. Class 1 and 2 Control Circuits: Stranded copper Type THHN-THWN.
 3. Class 3 Control Circuits: Stranded copper Type TW or TF.
 4. All Communication cabling will be in accordance with manufactures recommendation. It will have a purple jacket.
- C. Power Conductors: Copper, solid for No. 10 AWG and smaller and stranded for No. 8 AWG and larger, with THHN-THWN insulation. Aluminum conductors will not be accepted.
- D. Grounding Conductors: Copper, solid for No. 8 AWG and smaller and stranded for No. 6 AWG and larger, with THHN-THWN insulation. Aluminum conductors will not be accepted.

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- E. Conduits: Blue EMT (electrical metallic tubing) conduit for above grade indoor applications and RNC (rigid non-metallic conduit) Type EPC Schedule 80 PVC for outdoor above and below grade applications unless otherwise indicated.
- F. Flexible Connections: FMC (flexible metallic conduit) for above ceiling applications and LFMC (liquid-tight flexible metal conduit) for above grade indoor and outdoor applications. Flexible connections shall be no more than 24inches long.
- G. Surface-Mounted Raceway: Wiremold for finished indoor spaces and exposed-to-view. Blue EMT conduit for unfinished utility spaces.

PART 3 - EXECUTION

3.1. INSTALLATION

- A. Disconnect Switches: Provide disconnect switches for all HVAC equipment. Disconnect switches shall be sized to comply with NFPA 70. Single fan, blower and pump motors shall be based on nameplate horsepower. All other applications shall be based on nameplate total kW rating. Disconnects shall be provided with dual-element fuses sized based on equipment nameplate rating.
 - 1. Service Disconnect Switches: Where the disconnecting means is not within the line-of-sight, as defined by NFPA 70 and the authority having jurisdiction (AHJ), an additional service disconnect shall be located adjacent to the equipment it feeds.

DISCONNECT SWITCH SIZES for MOTORS						
AMPERAGE RATING	MAX HP at VOLTAGE/PHASE					
	115V/1ph	200V/1ph	230V/1ph	200V/3ph	230V/3ph	460V/3ph
30A	1.5	3	3	5	7.5	15
60A	3	7.5	10	15	15	30
100A	-	-	-	25	25	60
200A	-	-	-	50	60	100
400A	-	-	-	100	125	250

DISCONNECT SWITCH SIZES for EQUIPMENT							
AMPERAGE RATING	MAX KW at VOLTAGE/PHASE						
	120V/1ph	208V/1ph	240V/1ph	277V/1ph	208V/3ph	240V/3ph	480V/3ph
30A	2.8	5.0	5.8	6.6	8.6	10.0	19.9
60A	5.8	10.0	11.5	13.3	17.3	19.9	39.9
100A	9.6	16.6	19.2	22.2	28.8	33.2	66.4
200A	19.2	33.3	38.4	44.3	57.6	66.4	132.9
400A	38.4	66.6	76.8	88.6	115.1	132.9	265.7
600A	57.6	99.8	115.2	133.0	172.7	199.3	398.6

- B. Motor Starters: Provide all motor starters where required for HVAC equipment to operate as intended. Motor starters shall be sized to comply with NFPA 70 and NEMA rated for magnetic starters.

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NEMA STARTER SIZES					
NEMA SIZE	MAX HP at MOTOR VOLTAGE/PHASE				
	115V/1ph	230V/1ph	200V/3ph	230V/3ph	460V/3ph
00	0.33	1	1.5	1.5	2
0	1	2	3	3	5
1	2	3	7.5	7.5	10
2	-	7.5	10	15	25
3	-	-	25	30	50
4	-	-	40	50	100
5	-	-	75	100	200

- C. Combination Motor Starters and Disconnect Switches: Provide combination motor starters and disconnect switches that meet the requirements of the “Motor Starters” article above. Combination motor starters and disconnect switches shall be used unless otherwise noted or prohibited by NFPA 70.
- D. Manual Motor Switches: Provide manual motor switches for fractional horsepower fan, blower and pump motors that do not require automated start and stop functions.
- E. Furnish and install device fuses per equipment unit nameplate.
- F. Size and adjust circuit breaker disconnect switches per equipment unit nameplate.
- G. Electrical Connections: All electrical connections shall be made in accordance with equipment manufacturer’s recommendations and in accordance with NFPA 70. Install and ground equipment connections in accordance with the requirements of NFPA 70 and Division 26.
 - 1. Electrical Connections, Low Voltage (100 to 600 V): Division 23 contractor is responsible for power wiring and conduit from the equipment connections to the disconnecting means. Division 26 is responsible for the power circuit from the power source to the disconnecting means.
 - 2. Electrical Connections, Control Voltage (Up to 24 V): Division 23 contractor is responsible for all control voltage wiring and conduit for HVAC equipment and controls from the low voltage power source disconnecting means. Division 26 is responsible for the low voltage power circuit from the power source to the disconnecting means.
 - a. Low Voltage Disconnecting Means: Where dedicated low voltage circuits are indicated in Division 26 documents, the disconnecting means shall be defined as the disconnect switch or junction box provided. Where dedicated low voltage circuits are not explicitly indicated in Division 26 documents, the disconnecting means shall be defined as 20A/1P spare circuit breakers in panelboards.
- H. Wiring Pathway, Low and Control Voltage: All low and control voltage power and control wiring shall be installed in conduit unless otherwise noted.
 - 1. Surface-mounted raceway may only be used when indicated or Engineer approved prior to installation. In most cases, conduits shall be installed within walls, above ceilings and below floor slabs. Cut and repair substrates to install raceway.

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2. Control voltage cabling shall be plenum-rated and organized with J-hooks when control cabling is not required by the Engineer to be installed in conduit.
- I. Grounding and Bonding: Ground and bond equipment and circuits in accordance with the requirements of NFPA 70..

3.2. FIELD QUALITY CONTROL

- A. Comply with NFPA 70E per OSHA 29CFR Part 1910.5, Appendix A.

3.3. DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain electrical devices.

END OF SECTION 23 05 11

**DPS HVAC Controls Replacement for:
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SECTION 23 05 23 - VALVES FOR HYDRONIC PIPING SYSTEMS

PART 1 - GENERAL

1.1. SUMMARY

- A. Section includes general duty valves for HVAC piping systems such as angle, ball, butterfly, check, gate and globe valves and associated accessories.

1.2. ACTION SUBMITTALS

- A. Product Data: For each type of valve indicated.

1.3. QUALITY ASSURANCE

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 2. ASME B31.1 for power piping valves.
 - 3. ASME B31.9 for building services piping valves.

1.4. DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.
 - 3. Set angle, gate, and globe valves closed to prevent rattling.
 - 4. Set ball and plug valves open to minimize exposure of functional surfaces.
 - 5. Set butterfly valves closed or slightly open.
 - 6. Block check valves in either closed or open position.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

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PART 2 - PRODUCTS

2.1. GENERAL REQUIREMENTS FOR VALVES

- A. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
 - 1. Bray
 - 2. Crane Company / Crane Fluid Systems
 - 3. DeZurik
 - 4. Metso / Jamesbury and Neles
 - 5. Milwaukee Valve / Hammond Valve
 - 6. NIBCO
 - 7. Powell Valves
- B. Refer to HVAC valve schedule articles for applications of valves.
- C. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- D. Valve Sizes: Same as upstream piping unless otherwise indicated.
- E. Valve Actuator Types:
 - 1. Gear Actuator: For quarter-turn valves 6-inches NPS and larger.
 - 2. Handwheel: For valves other than quarter-turn types.
 - 3. Handlever: For quarter-turn valves 4-inches NPS and smaller except plug valves.
 - 4. Wrench: For plug valves with square heads. Furnish Owner with 1 wrench for every 5 plug valves, for each size square plug-valve head.
 - 5. Chainwheel: Device for attachment to valve handwheel, stem, or other actuator; of size and with chain for mounting height of 7-feet or higher.
- F. Valves in Insulated Piping: Provide valves with 2-inch stem extensions for piping temperatures 180 deg F and lower and 4-inch for above 180 deg F.
 - 1. Gate Valves: With rising stem.
 - 2. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
 - 3. Butterfly Valves: With extended neck.
- G. Valve-End Connections:
 - 1. Flanged: With flanges according to ASME B16.1 for iron valves.
 - 2. Threaded: With threads according to ASME B1.20.1.
 - 3. Socket Welded: 2-inch NPS and smaller piping.

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H. Valve Bypass and Drain Connections: MSS SP-45.

2.2. ANGLE VALVES

- A. Angle Valves, 2-inches NPS and smaller: Bronze body with integral seat and union-ring bonnet angle valves with bronze trim, PTFE or TFE seats and asbestos-free packing, Class 150 rated for 300 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-80. Valves shall have threaded or solder ends to match piping.
- B. Angle Valves, 2 1/2-inches NPS and larger: Iron body and bolted-bonnet angle valves with bronze trim, PTFE or TFE seats and asbestos-free packing, Class 125 rated for 200 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-85. Valves shall have flanged ends.

2.3. BALL VALVES

- A. Ball Valves, 2-inches NPS and smaller: Two-piece, full-port, quarter-turn, forged brass ball valves with stainless steel trim, PTFE or TFE seats, adjustable stem packing and anti-blowout stem, rated for 600 psig CWP (cold working pressure). Valves shall comply with MSS SP-110. Valves shall have threaded ends.

2.4. BUTTERFLY VALVES

- A. Butterfly Valves, 2 1/2-inches NPS and larger: Iron single-flange, cast-iron or ductile-iron butterfly valves with stainless steel disc, stainless steel stem, EPDM seat, rated for 150 psig CWP (cold working pressure). Valve body shall be lug type suitable for bi-directional dead-end service at rated pressure without the use of a downstream flange. Valves shall comply with MSS SP-67, Type I. Valves shall have flanged ends.
- B. High-Performance Butterfly Valves, 2 1/2-inches NPS and larger: Single-flange, carbon-steel high-performance butterfly valves with carbon steel disc, stainless steel stem offset from seat plane, reinforced PTFE or metal seat, Class 150 rated. Valve body shall be lug type suitable for bi-directional dead-end service at rated pressure without the use of a downstream flange. Valves shall comply with MSS SP-68. Valves shall have flanged ends.

2.5. CHECK VALVES

- A. Lift Check Valves, 2-inches NPS and smaller: Bronze lift check valves for vertical flow with bronze disc and Class 125 rated for 200 psig CWP (cold working pressure). Valves shall comply with MSS SP-80. Valves shall have threaded ends.
- B. Swing Check Valves, 2-inches NPS and smaller: Y-pattern bronze swing check valves for horizontal flow with bronze disc and Class 150 rated for 300 psig CWP (cold working pressure). Valves shall comply with MSS SP-80. Valves shall have threaded ends.
- C. Swing Check Valves, 2 1/2 to 12-inches NPS: Cast-iron swing check valves for horizontal flow with bolted bonnet, bronze trim, asbestos-free gasket and Class 125 rated for 200 psig

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- CWP (cold working pressure). Valves shall comply with MSS SP-71. Valves shall have flanged ends.
- D. Swing Check Valves, 14-inches NPS and larger: Cast-iron swing check valves for horizontal flow with bolted bonnet, bronze trim, asbestos-free gasket and Class 125 rated for 150 psig CWP (cold working pressure). Valves shall comply with MSS SP-71. Valves shall have flanged ends.
 - E. Swing Check Valves with Spring Closure, 2 1/2 to 12-inches NPS: Cast-iron swing check valves for horizontal flow with bolted bonnet, bronze trim, asbestos-free gasket, factory-installed exterior lever and spring and Class 125 rated for 200 psig CWP (cold working pressure). Valves shall comply with MSS SP-71. Valves shall have flanged ends.
 - F. Swing Check Valves with Spring Closure, 14-inches NPS and larger: Cast-iron swing check valves for horizontal flow with bolted bonnet, bronze trim, asbestos-free gasket, factory-installed exterior lever and spring and Class 125 rated for 150 psig CWP (cold working pressure). Valves shall comply with MSS SP-71. Valves shall have flanged ends.
 - G. Dual-Plate Check Valves, 2 1/2- to 12-inches NPS: Non-slam wafer type dual-plate check valve with cast or ductile-iron body, bronze seat and spring-loaded plates and Class 150 rated for 300 psig CWP (cold working pressure). Valves shall comply with API 594.
 - H. Dual-Plate Check Valves, 14-inches NPS and larger: Non-slam wafer type dual-plate check valve with cast or ductile-iron body, bronze seat and spring-loaded plates and Class 150 rated for 250 psig CWP (cold working pressure). Valves shall comply with API 594.
 - I. Center-Guided Check Valves, 2 1/2-inches NPS and larger: Center-guided spring-loaded globe type check valves with gray iron body, EPDM or NBR seat, and Class 300 rated for 300 psig CWP (cold working pressure). Valves shall comply with MSS SP-125. Valves shall have flanged ends.

2.6. GATE VALVES

- A. Gate Valves, 2-inches NPS and smaller: Bronze rising-stem gate valves with integral seat and union-ring bonnet, bronze stem, solid-wedge bronze disc and asbestos-free packing and Class 150 rated for 300 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-80. Valves shall have threaded ends.
- B. Gate Valves, 2 1/2 to 12-inches NPS: Iron rising-stem gate valves with bolted-bonnet, bronze trim, solid-wedge disc and asbestos-free packing and Class 125 rated for 200 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-70. Valves shall have flanged ends.
- C. Gate Valves, 2 1/2 to 12-inches NPS: Iron OS&Y gate valves with bolted-bonnet, bronze trim, solid-wedge disc, asbestos-free packing and gasket, and Class 125 rated for 200 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-70. Valves shall have flanged ends.
- D. Gate Valves, 14-inches NPS and larger: Iron rising-stem gate valves with bolted-bonnet, bronze trim, solid-wedge disc and asbestos-free packing and Class 125 rated for 150 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-70. Valves shall have flanged ends.

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- E. Gate Valves, 14-inches NPS and larger: Iron OS&Y gate valves with bolted-bonnet, bronze trim, solid-wedge disc, asbestos-free packing and gasket, and Class 125 rated for 150 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-70. Valves shall have flanged ends.

2.7. GLOBE VALVES

- A. Globe Valves, 2-inches NPS and smaller: Bronze body with integral seat and union-ring bonnet globe valves with bronze trim, PTFE or TFE seats and asbestos-free packing, Class 150 rated for 300 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-80. Valves shall have threaded ends.
- B. Globe Valves, 2 1/2-inches NPS and larger: Iron body and bolted-bonnet globe valves with bronze trim, PTFE or TFE seats and asbestos-free packing, Class 125 rated for 200 psig CWP (cold working pressure). Hand-wheels shall be malleable or ductile iron. Valves shall comply with MSS SP-85. Valves shall have flanged ends.

2.8. MANUAL CALIBRATED BALANCING VALVES

- A. Manual Calibrated Balancing Valves: Armstrong CBV Series, Bell & Gossett Circuit Setter Plus Series, Griswold QuickSet Series or TACO Accu-Flo Series.
 - 1. Flow Verification: Provide a differential pressure versus flow calibration charts for use by the Engineer and TAB sub-contractor.
- B. Manual Calibrated Balancing Valves, 2-inches NPS and smaller: Manual balancing valve with bronze or copper-alloy body; calibrated ball or globe type orifice or venturi for flow control; brass or stainless ball; PTFE seat; two pressure gage connections with integral seals for portable differential pressure meter; drain tapping; and rated for 125 psig CWP (cold working pressure). Valve shall have hand lever shall have memory stop and integral pointer and calibrated scale to register the degree of valve opening. Valves shall have threaded ends.
- C. Manual Calibrated Balancing Valves, 2 1/2-inches NPS and larger: Manual balancing valve with cast or ductile-iron body; calibrated ball or globe type orifice or venturi for flow control; brass or stainless ball; PTFE seat; two pressure gage connections with integral seals for portable differential pressure meter; drain tapping; and rated for 125 psig CWP (cold working pressure). Valve shall have hand lever shall have memory stop and integral pointer and calibrated scale to register the degree of valve opening. Valves shall have flanged ends.

2.9. AUTOMATIC BALANCING VALVES

- A. Automatic Balancing Valves: Valves shall maintain constant flow within 5 percent, plus or minus, over system pressure fluctuations.
 - 1. Flow Verification: Provide electronic differential pressure meter that can read differential pressure including flowmeter, probes, hoses, flow charts and carrying case.
 - 2. Cartridge Exchange: For up to 1 year from acceptance of the final TAB Report, up to 10% of cartridges in the project may be replaced as needed for any reason as determined by the Engineer.

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- B. Automatic Balancing Valves, 2-inches NPS and smaller: Combination automatic balancing valve and isolation valve with Y-pattern brass body; removable stainless steel flow cartridge; stainless steel spring; EPDM O-ring; two pressure and temperature ports; and rated for 175 psig CWP (cold working pressure). Isolation valve shall be quarter-turn ball valve with brass or stainless steel ball. Flow cartridge shall be stamped with flow rate. Flow Design (FDI) AutoFlow AC Series, Griswold Isolator R Series, Nexus Valve UltraMatic UM Series, or Victaulic 76 Series.
- C. Automatic Balancing Valves, 2 1/2-inches NPS and larger: Automatic balancing valve with wafer-style ductile-iron body; stainless steel flow cartridge; stainless steel spring; EPDM cartridge seal; two pressure and temperature ports; and rated for 200 psig CWP (cold working pressure). Flow Design (FDI) WS Series, Griswold Wafer Series or Nexus Valve UltraMatic UMW Series.

2.10. CONTROL VALVES

- A. Comply with the requirements of Section 230900.

2.11. CHAINWHEELS

- A. Description: Valve actuation assembly with sprocket rim, brackets, and chain.
 - 1. Brackets: Type, number, size, and fasteners required to mount actuator on valve.
 - 2. Sprocket Rim with Chain Guides: Ductile iron of type and size required for valve.
 - 3. Chain: Hot-dip, galvanized steel, of size required to fit sprocket rim.

PART 3 - EXECUTION

3.1. EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2. VALVE INSTALLATION

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- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Install valves in branch lines to isolate sections of the piping system.
- C. Locate valves for easy access and provide separate support where necessary.
- D. Install valves in horizontal piping with stem at or above center of pipe. Valves with stems below center of piping are not acceptable.
- E. Install valves in position to allow full stem movement.
- F. Valves shall be equipped with stem extensions for all applications where the piping will be insulated.
- G. Install chainwheels on operators for ball, butterfly, gate and globe valves 3-inches NPS and larger and more than 7-feet above floor. Extend chains to 60 inches above finished floor. Provide hooks to hold chains to the side to allow a clear walkway path.
- H. Install shutoff-duty valves at each branch connection to supply mains and at supply connection to each piece of equipment.
- I. Install calibrated-orifice, balancing valves in the return pipe of each heating or cooling terminal.
- J. Install check valves at each pump discharge and elsewhere as required to control flow direction.
- K. Install check valves for proper direction of flow and as follows:
 - 1. Swing Check Valves: In horizontal position with hinge pin level.
 - 2. Plate-Type Check Valves: In horizontal or vertical position, between flanges.
 - 3. Lift Check Valves: With stem upright and plumb.
- L. Install control valves in locations indicated in details and as needed to perform the sequence of operations.
- M. Install pressure / temperature ports as indicated in the details and on the inlet and discharge side of each balancing and control valve.

3.3. ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4. GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. Hydronic piping systems shall use the following valve types unless otherwise indicated on the drawings or in other Division 23 sections:
 - 1. Shutoff: Ball or butterfly.
 - 2. Throttling: Globe, ball or butterfly.

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3. Pump Discharge Check Valves: For 2-inches NPS and smaller, swing check valves. For 2 1/2-inches NPS and larger, non-slam wafer-style plate check valves.
 4. Balancing:
 - a. Two-Way Modulating, Pressure Independent Control Valves: None.
 - b. Two-Way Modulating, Pressure Dependent Control Valves: Automatic.
 - c. Two-Way Two-Position Pressure Dependent Control Valves: Automatic.
 - d. Three-Way Modulating Pressure Dependent Control Valves: Automatic.
 - e. Constant Speed Pumps: Manual-calibrated with balanced flow set point.
 - f. Boilers, Heat Exchangers, Chillers and Cooling Towers: Automatic.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

END OF SECTION 23 05 23

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SECTION 23 05 53 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1. SUMMARY

- A. Section includes equipment, pipe and duct labels and tags.

1.2. ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Valve Schedules: For each piping system to include in maintenance manuals.

1.3. COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1. EQUIPMENT LABELS

- A. Plastic Labels for Equipment: 1/8-inch multilayer, multicolor, plastic labels for mechanical engraving suitable for temperatures up to 160 deg F with pre-drilled holes for stainless steel rivets or self-tapping screws. Labels shall be minimum 2-1/2 inches wide and 3/4-inch tall with 3/8-inch white letters on black background.
 - 1. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include equipment's drawing designation or unique equipment number.

2.2. WARNING SIGNS AND LABELS

- A. Warning Signs and Labels: 1/8-inch multilayer, multicolor, plastic labels for mechanical engraving suitable for temperatures up to 160 deg F with pre-drilled holes for stainless steel rivets or self-tapping screws. Labels shall be minimum 2-1/2 inches wide and 3/4-inch tall with 3/8-inch white letters on black background.
 - 1. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include caution and warning information, plus emergency notification instructions.

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2.3. PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Pre-printed, color-coded, with lettering indicating service, and showing flow direction.
- B. Pre-tensioned Pipe Labels: Pre-coiled, semi-rigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
 - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
 - 2. Lettering Size: At least 1-1/2 inches high.

2.4. DUCT LABELS

- A. Plastic Labels for Duct: 1/8-inch multilayer, multicolor, plastic labels for mechanical engraving suitable for temperatures up to 160 deg F with pre-drilled holes for stainless steel rivets or self-tapping screws. Labels shall be minimum 2-1/2 inches wide and 3/4-inch tall with 3/8-inch white letters on black background.
 - 1. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on drawings, duct size, and an arrow indicating flow direction.
 - 1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.
 - 2. Lettering Size: At least 1-1/2 inches high.

2.5. STENCILS

- A. Stencils: Prepared with letter sizes according to ASME A13.1 for piping; minimum letter height of 1-1/4 inches for ducts; and minimum letter height of 3/4 inch for access panel and door labels, equipment labels, and similar operational instructions. Stencil paint shall be exterior, gloss, acrylic enamel.

2.6. VALVE TAGS

- A. Valve Tags: 0.032-inch thick brass or 0.025-inch thick stainless steel, stamped or engraved, with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers with pre-drilled or stamped holes for beaded chain or S-hook attachment hardware.
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 - 1. Valve-tag schedule shall be included in operation and maintenance data.

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2.7. CEILING TAGS

- A. Ceiling Tags: 0.030-inch thick and 3/4 to 7/8-inch diameter rigid vinyl, self-adhesive, white or clear plastic tags with pre-printed, minimum 1/8-inch tall block-letter black text indicating the equipment, valve or accessory tag and number designations.

2.8. WARNING TAGS

- A. Warning Tags: 5-1/4 inches wide and 3-inches tall, pre-printed or partially pre-printed, accident-prevention tags, of plasticized card stock with matte finish suitable for writing, fastened with reinforced grommet and wire. Tags shall have Yellow background and Black letters with large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."

2.9. SENSOR TAGS

- A. Sensor Tags: 1/4-inch wide, pre-printed, clear vinyl adhesive tags with 1/8-inch tall block-letter black text. Each sensor shall be clearly and neatly labelled. Tags shall denote the associated piece of equipment, for example "TU-123".

PART 3 - EXECUTION

3.1. PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulates.

3.2. PIPE COLOR AND LABEL INSTALLATION

- A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 1. Near each valve and control device.
 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 5. Near major equipment items and other points of origination and termination.
 6. Spaced at maximum intervals of 25 feet along each run. Reduce intervals to 10 feet in areas of congested piping and equipment.

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7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- B. Piping Color Schedule:
 1. Chilled-Water Piping: Dark Blue background with White letters and flow arrows.
 2. Condenser-Water Piping: Light Blue background with White letters and flow arrows.
 3. Heating Water Piping: Dark Red background with White letters and flow arrows.
 4. Domestic Water Piping: Green background with White letters and flow arrows.
 5. Dual Temperature Piping: Purple background with White letters and flow arrows.
 6. Refrigerant Piping: Black background with White letters and flow arrows.
 7. Steam and Condensate Return Piping: Orange background with Black letters and flow arrows.
 8. Natural Gas, LP Gas and Fuel Oil Piping: Bright Yellow background with Black letters and flow arrows.

3.3. EQUIPMENT COLOR AND LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.
- C. Equipment Color Schedule: Insulation color and label scheme shall match the associated piping system.

3.4. DUCT COLOR AND LABEL INSTALLATION

- A. Duct Labels: Install self-adhesive duct labels with permanent adhesive on air ducts.
- B. Stenciled Duct Label Option: Stenciled labels, showing service and flow direction, may be provided instead of plastic-laminated duct labels, at Installer's option, if lettering larger than 1 inch high is needed for proper identification because of distance from normal location of required identification.
- C. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 25 feet in each space where ducts are exposed or concealed by removable ceiling system.
- D. Duct Color Schedule:
 1. Supply, Return and General Exhaust: White background with Black letters and flow arrows.
 2. Hazardous Exhaust: Yellow background with Black letters and flow arrows.
 3. Refer to Section 230713 for painting requirements.

3.5. VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-

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watering hose connections; and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
1. Valve-Tag Size and Shape: 1-1/2 inches diameter.
 2. Valve-Tag Colors: Black letters on brass finish tags.
 3. Chilled-Water Piping: Dark Blue background with White letters.
 4. Condenser-Water Piping: Light Blue background with White letters.
 5. Heating Water Piping: Dark Red background with White letters.
 6. Domestic Water Piping: Green background with White letters.
 7. Dual Temperature Piping: Purple background with White letters.
 8. Refrigerant Piping: Black background with White letters.
 9. Steam and Condensate Return Piping: Orange background with Black letters.
 10. Natural Gas, LP Gas and Fuel Oil Piping: Bright Yellow background with Black letters.

3.6. CEILING TAG INSTALLATION

- A. Install ceiling tags on lay-in grid and access doors below equipment, valves and accessories above finished ceilings. Center tags on grid members and doors.

3.7. WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

3.8. SENSOR TAG INSTALLATION

- A. Install sensor tags for wall or ceiling-mounted sensors on faceplates centered below the device. Install sensor tags for concealed sensors on sensor enclosures or backboxes. Where sensors are located above lay-in ceilings, behind access doors, or otherwise remotely accessible, label the grid or door in addition to the device itself. Tags shall be centered and neatly applied.

END OF SECTION 23 05 53

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SECTION 23 09 00 – DIGITAL CONTROLS AND INSTRUMENTATION

PART 1 - GENERAL

1.1. SUMMARY

- A. This Section includes control equipment for HVAC systems and components, including control components for terminal heating and cooling units not supplied with factory-wired controls.
- B. Durham Public Schools has a Master Integrator contract with Brady Trane for graphics and integration with overall system wide server. Controls Contractor shall include Brady Trane's cost of work within this bid.

1.2. ACTION SUBMITTALS

- A. Product Data: Include manufacturer's technical literature for each control device. Indicate dimensions, capacities, performance characteristics, electrical characteristics, finishes for materials, installation guides, and startup instructions for each type of product indicated.
 - 1. DDC System Hardware: Bill of materials of equipment indicating quantity, manufacturer, and model number. Include technical data for operator workstation equipment, interface equipment, control units, transducers/transmitters, sensors, actuators, valves, relays/switches, control panels, and operator interface equipment.
 - 2. Control System Software: Include technical data for operating system software, operator interface, color graphics, and other third-party applications.
 - 3. Controlled Systems: Instrumentation list with element name, type of device, manufacturer, model number, and product data. Include written description of sequence of operation including schematic diagram.
- B. Shop Drawings:
 - 1. DDC System: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - a. Bill of materials of equipment indicating quantity, manufacturer, and model number.
 - b. Schematic flow diagrams showing fans, pumps, coils, dampers, valves, and control devices.
 - c. Wiring Diagrams: Power, signal, and control wiring.
 - d. Details of control panel faces, including controls, instruments, and labeling.
 - e. Written description of sequence of operation.
 - f. Schedule of dampers including size, leakage, and flow characteristics.
 - g. Schedule of valves including flow characteristics, pressure differentials, and flow coefficients (Cv).

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- h. DDC System Hardware:
 - 1) Wiring diagrams for control units with termination numbers.
 - 2) Schematic diagrams and floor plans for field sensors and control hardware.
 - 3) Schematic diagrams for control, communication, and power wiring, showing trunk data conductors and wiring between operator workstation and control unit locations.
- i. Control System Software: Provide all software required to program and maintain the system
- j. Controlled Systems:
 - 1) Schematic diagrams of each controlled system with control points labeled and control elements graphically shown, with wiring.
 - 2) Scaled drawings showing mounting, routing, and wiring of elements including bases and special construction.
 - 3) Written description of sequence of operation including schematic diagram.
 - 4) Points list.
- k. Samples for Verification: For each color required, of each type of thermostat or sensor cover.

1.3. INFORMATIONAL SUBMITTALS

- A. Data Communications Protocol Certificates: Certify that each proposed DDC system component complies with ASHRAE 135.
- B. Qualification Data: For installer.
- C. Software Upgrade Kit: For Owner to use in modifying software to suit future systems revisions or monitoring and control revisions.

1.4. CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For HVAC instrumentation and control system to include in emergency, operation, and maintenance manuals, including the following:
 - 1. Maintenance instructions and lists of spare parts for each type of control device.
 - 2. Interconnection wiring diagrams with identified and numbered system components and devices.
 - 3. Keyboard illustrations and step-by-step procedures indexed for each operator function.
 - 4. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
 - 5. Calibration records and list of set points.
 - 6. Verification of 100 percent of all control and monitoring points and all control sequences prior to Engineer and Commissioning Authority witnessing and testing.
- B. Software and Firmware Operational Documentation: Include the following:

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1. Software operating and upgrade manuals for all software required to program and maintain the system.
 2. Program Software Backup: On a magnetic media or compact disc, complete with data files.
 3. Device address list.
 4. Printout of software application and graphic screens.
 5. Software license required by and installed for DDC workstations and control systems.
- C. Software Back-Up Electronic Files

1.5. MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Replacement Materials: One replacement diaphragm or relay mechanism for each unique valve motor, controller, thermostat, humidistat and positioning relay.

1.6. QUALITY ASSURANCE

- A. The building automation system (BAS) shall be furnished, engineered, installed, tested and calibrated by factory certified technicians qualified for this work. The contractor shall be factory authorized in good standing with the manufacturer. Factory trained technicians shall provide instruction, routine maintenance, and emergency service within 24 hours upon receipt of request.
1. Upon request, installer shall present records of successful completion of factory training courses including course outlines.
 2. Upon request, the installer shall provide a letter from the manufacturer that they are a Factory Authorized installer in good standing with the Manufacturer.
- B. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this project.
- C. Electrical Components, Devices, and Accessories: UL listed and labeled complying with the requirements of NFPA 70, Section 230511 and Division 26.
- D. Comply with UL 916 for Energy Management Systems.
- E. Comply with UL 864 for Smoke Control System components if required.
- F. Control panels, new and modified, shall comply with UL 508A. Field-built or modified panels shall be inspected, listed and labeled in the field or replaced with an equivalent shop built panel that is listed and labeled.
- G. Local and Terminal Control Units shall be BACnet Testing Lab (BTL) listed.
- H. Comply with ASHRAE 135 for DDC system components.

1.7. DELIVERY, STORAGE, AND HANDLING

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- A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, arrange for shipping of control devices to equipment manufacturer.
- B. System Software: Update to latest version of software at project completion. If the Owner has an established energy management system serving buildings outside the scope of this project, ensure the software is compatible with the existing system without needing to update it.

1.8. COORDINATION

- A. Coordinate location of thermostats, humidistats, and other exposed control sensors with plans and room details before installation. Verify all locations with Engineer prior to installation.
- B. Coordinate equipment with the fire alarm system to achieve compatibility with equipment that interfaces with that system.
- C. Coordinate sources of 120V power with the Owner for control units, operator workstation and other devices. Extend power from sources as needed.
- D. Coordinate location of data ports with the Owner.

1.9. SEQUENCE OF OPERATION

- A. Sequences of Operation are located on the control drawings. Submit standard sequences for incidental items not shown for Engineer approval.

1.10. WARRANTY

- A. Building Automation System: Parts and labor for 1 year from the date of substantial completion. The Owner reserves the right to make changes to the BAS during the warranty period and such changes do not constitute a waiver of the warranty.
- B. Electronic Actuators: Parts and labor for 5 years from the date of substantial completion.

PART 2 - PRODUCTS

2.1. GENERAL REQUIREMENTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Distech Controls
 - 2. Honeywell
 - 3. Johnson Controls
 - 4. Trane Controls
 - 5. Schneider Electric
- B. Products by the DDC system manufacturer shall include user interface, controller software, application programming language and equipment and application controllers. Sensors,

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actuators, valves, dampers and other components may be manufactured by others as indicated.

- C. Description: DDC system with BACnet system level protocol, having all points exposed to BACnet/IP, and Tridium Niagara 4 integration software framework. All JACE's will be JACE 8000 running a minimum of version 3.8. The control system shall consist of sensors, indicators, actuators, final control elements, interface equipment, other apparatus, accessories and software connected to distributed controllers operating in multiuser, multitasking environment on token-passing network and programmed to control mechanical systems. An operator workstation permits interface with the network via dynamic color graphics with each mechanical system, building floor plan, and control device depicted by point-and-click graphics. The control system shall be complete and fully operable.
 - 1. Tridium Niagara Licenses: All Niagara based systems shall have "open" licenses. The system shall not prevent another vendor from accessing and modifying the software with the proper admin login. Proprietary software shall not be required for future vendors to integrate with this system. No proprietary JAR (Java ARchive) files or other drivers shall be used on the JACE hardware. If any hardware or software must be modified, repaired, or replaced in the future, any qualified vendor shall be able to do so without the support of this system's vendor.

2.2. OPEN ARCHITECTURE

- A. DDC system shall provide an open, interoperable and integrated architecture with a peer-to-peer networked, stand-alone, distributed control system with the capability to integrate BACnet/IP, BACnet MS/TP, LonWorks, Modbus IP, Modbus RTU, Modbus TCP, Niagara 4, AX and proprietary legacy communication protocols in a single interoperable system. The system shall be accessible by web browsers with secured access.
- B. BACnet Compliance: Comply with ASHRAE Standard 135. For each BACnet device, submit Protocol Implementation Conformance Statement (PICS) document showing the device's minimum compliance of Level 3.
 - 1. Modbus: For each Modbus device, submit Registry Map of available data points.
- C. BACnet Device Connections: Physical connection to BACnet devices shall be Ethernet (BACnet/IP) and/or RS-485 (BACnet MS/TP) cables.
- D. Peer-to-Peer Controllers: Controllers shall be peer-to-peer communicating devices. Controllers requiring "polling" by a host to pass data is not acceptable.
- E. Control System Server: Structural Query Language (SQL) using Open Database Connectivity (ODBC) compliant server database stored on a server. Systems requiring a proprietary database and/or user interface programs are not acceptable.

2.3. SYSTEM PERFORMANCE

- A. Description: The system shall comply with the following minimum performance requirements coordination with the Systems Integrator will be required:
 - 1. Graphic Display: Display graphic with minimum 20 dynamic points with current data within 10 seconds.

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2. Graphic Refresh: Update graphic with minimum 20 dynamic points with current data within 8 seconds.
3. Object Command: Reaction time of less than 2 seconds between operator command of a binary object and device reaction.
4. Object Scan: Transmit change of state and change of analog values to control units or workstation within 6 seconds.
5. Alarm Response Time: Annunciate alarm at workstation within 45 seconds. Multiple workstations must receive alarms within five seconds of each other.
6. Program Execution Frequency: Run capability of applications as often as 5 seconds, but selected consistent with mechanical process under control.
7. Performance: Programmable controllers shall execute DDC PID control loops and scan and update process values and outputs at least once per second.

2.4. NETWORKS

- A. Virtual Local Area Network (VLAN): The minimum 100 MB/second Ethernet VLAN shall connect a local control system server, operator workstation and multiple Java Application Control Engines (JACE's). The VLAN shall support XML internet protocol, Hypertext Transfer Protocol (HTTP), Simple Object Access Protocol (SOAP), Java, BACnet and LonWorks.
- B. Local Area Network (LAN): The minimum 100 MB/second Ethernet LAN shall comply with IEEE Standard 802.3 and use 100 Base-TX, UTP-8 wire, Category 5 (Cat 5) cabling.
- C. Remote Access: The VLAN shall be accessible without proprietary software by commonly available web browsers (i.e. Microsoft Internet Explorer, Google Chrome, Mozilla Firefox and Apple Safari) with tiered username and password security access.
 1. Internet Access: The Owner shall provide high-speed internet connection for access to the VLAN. The Owner shall provide temporary secured access, for the duration of the project through the one-year walk-through, to the VLAN users.

2.5. DDC EQUIPMENT

- A. BAS Server: Will be provided by the owner.

2.6. DDC SOFTWARE

- A. General Requirements:
 1. Alarm processing, messages, and reactions.
 2. Trend logs retrievable in spreadsheets and database programs.
 3. Alarm and event processing.
 4. Object and property status and control.
 5. Automatic restart of field equipment on restoration of power.
 6. Data collection, reports, and logs. Include standard reports for the following:
 - a. Current values of all objects.

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- b. Current alarm summary.
 - c. Disabled objects.
 - d. Alarm lockout objects.
 - e. Logs.
 7. Custom report development.
 8. Utility and weather reports.
 9. Workstation application editors for controllers and schedules.
 10. Maintenance management.
- B. Custom Application Software:
1. English language oriented.
 2. Full-screen character editor/programming environment.
 3. Allow development of independently executing program modules with debugging/simulation capability.
 4. Support conditional statements.
 5. Support floating-point arithmetic with mathematic functions.
 6. Contains predefined time variables.
- C. Archiving: Automatically store data base back-up and trend data at one operator workstation and the server without operator action. Operator shall be able to manually download entire controller databases or parts thereof.

2.7. OPERATOR INTERFACE GRAPHIC SOFTWARE

- A. General:
1. It will be the responsibility of this contractor to coordinate with the System Integrators to provide the points required in this section
 2. Graphic software shall provide user-friendly and intuitive operation of the systems with minimal training and experience at each level of interface, including operator workstations, diagnostic terminal units, and mobile applications. It shall allow multi-tasking for third-party software and alarm graphics to display when in other software windows.
 3. Dynamic Data Displays: Automatically update point values at a minimum frequency of every 10 seconds or less. Data point displays shall be color-coded and indicate normal, abnormal, alarm, signal loss and override conditions.
 4. Override Function: Graphic software shall allow an override for each digital data point value and for each change in analog status. The override value shall reside in the equipment controller not just at the OWS.
 - a. Password Protection: Provide password protection for each level of importance as determined with the Owner.

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- b. Override Tracking: Each override shall be tagged with the associated operator's identification number, name or initials.

B. Floor Plan Graphics:

1. Provide floor plan graphics for all areas of the building(s) served by the BAS. Create floor plans with an appropriate level of detail based on the construction documents. Copying the construction document files is not acceptable as they usually contain too much detail to be legible on a single screen shot. Submit the proposed graphics with the Owner / Engineer for approval.
2. Provide links from floor plans to enlarge floor plan areas (zoom in feature). Provide links from enlarged floor plans to equipment diagrams.
3. Provide links from zone sensor locations on the floor plans to associated terminal equipment. Each temperature control zone shall be clearly indicated on the floor plans.
4. Coordinate room names and numbers with the Owner and building signage. Often the final room names and numbers differ from the construction documents.

C. Equipment / Terminal Unit Graphics:

1. Provide an equipment diagram indicating each component and sensor with a link to the written sequence of operation, maintenance notes, etc. Each diagram shall indicate all data points. Parameters shall be overridden / changed from the graphic.
2. Provide a link to associated equipment for each diagram. (For example, a terminal unit might have a link at the reheat coil to the heating water plant and the terminal box to the AHU feeding it.)
3. Provide a location for any point associated with an equipment diagram but located remotely. For example, a duct-mounted pressure sensor in the AHU diagram might be indicated to be 'Located AFC in 24x12 SA duct in Corridor 100 outside Room 101'.)
4. Terminal Unit Graphics: Typical terminal unit graphics shall include:
 - a. Minimum and maximum flow setpoints
 - b. Heating flow setpoints
 - c. Zone heating and cooling temperature, high and low humidity and carbon dioxide high limit setpoints (if applicable)
 - d. Terminal unit percent of maximum heating and cooling
 - e. Occupancy control mode and status
 - f. Alarm status.

D. Alarm Reporting:

1. Alarm Tag: Each alarm shall have a unique description tag, date and time. The tag shall be easily understood without the need to translate abbreviated or coded descriptions. The OWS shall be able to display, print and store each alarm message.
2. Alarm Prioritization: Each alarm type shall be assigned a priority level as defined by the Owner.
3. Alarm Acknowledgment: Each alarm shall be acknowledged by a recipient with password authorization via any form of operator interface. The alarm

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acknowledgement information including operator, date and time shall be saved with and append the alarm tag.

4. Alarm Summary Logs: Operators shall be able view all alarms and acknowledgements. They shall be sortable by date and time, operator, alarm type, and alarm priority.
 5. OWS interface shall monitor all alarms. Alarm notifications shall be automatically sent to Owner staff via email and text messaging based on staff and alarm prioritization. The system's ability to report alarms shall not be affected by a breakdown in communications with other control panels on the network.
 6. Alarms shall be defined by the Engineer's sequences of operation and the Owner.
- E. Trend Reporting:
1. Trend Tag: Each trend shall have a unique description tag, date and time duration. The tag shall be easily understood without the need to translate abbreviated or coded descriptions. The OWS shall be able to display, print and store trend data.
 2. Trend Summary Logs: Operators shall be able view all trend data. They shall be sortable by initiation date and time, operator, trend type.
 3. Trend Data Collection: Data shall be exported to a compressed file on the server in MS Excel or MS Access format. Data shall be able to be stored without over-writing the collected data files for no less than one year.
 4. Trends shall be defined by the Engineer's sequences of operation and the Owner.
- F. Asbuilts:
1. Schematics, wiring diagrams, points list and sequences of operation shall be provided in .PDF format so that the Systems Integrator can include a link to them to be displayed on the graphics. They will be in a format such that the owner will be able to view them from the graphic interface to assist in trouble shooting of the system.

2.8. MOBILE DEVICE APPLICATIONS

- A. It will be the responsibility of this contractor to coordinate with the Systems Integrator to provide required access to allow for the following modes of operation
- B. BAS shall have a remote interface via mobile applications for Android and iOS platforms. The application for mobile platforms shall provide real-time access to monitored inputs, setpoints, modes, values, statuses, and outputs.
 1. Operator interface consists of:
 - a. An icon-based, interactive application for Android and iOS devices.
 - b. Standard Android and iOS navigation methods shall be used to access, edit, and modify internal controller functions and shall be used to navigate through menus, select options and icons, and change parameters.
 - c. Navigable menus to display, select, edit, and modify values and other controller information.
 - d. List-based menus.
 - e. Icon-based menus.

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2. Operator interface shall use color-codes with icons and text lists to indicate values and controller statuses.
3. Operator interface shall, at a minimum, have the following functions:
 - a. Points: The operator interface shall provide points list menus to view the inputs, setpoints, and output values such as hardware inputs/outputs, analog values, binary values, and multistate values.
 - 1) The points lists menus shall allow the operator to monitor, set, and override controller points and values.
 - 2) A color-code shall be used to indicate the conditions and statuses of points displayed in the points list menus.
 - b. Alarms: The operator interface shall provide a controller's alarms menu to view details of an alarm, to acknowledge the alarm, and to view the alarm history.
 - 1) The alarm menu shall allow the operator to view the following type of alarms: active not acknowledged, active acknowledged, and inactive not acknowledged.
 - 2) The combination of an icon and its color state shall notify the operator of an alarm condition.
 - 3) The operator shall be able to select a single point in alarm to view further details such as the alarm to/from status, current status, event date and time, alarm event threshold, and alarm event value.
 - c. Overrides: The operator interface shall provide an overrides menu to view a list of the controller's overridden points such as hardware input, hardware output, value, constant, or variable. The menu shall allow the operator to select an overridden point and to modify or release the override on the selected point.
 - d. PID loops: The operator interface shall provide a PID Loops menu to view, configure, and adjust the PID parameters. The interface shall also provide visual PID tuning with live system response graphing (live-trend).
 - e. Favorites: The operator interface shall allow access to a list of bookmarked points.
 - f. Weather: The operator interface shall provide a weather menu to view the current weather conditions with a weather status icon. The units shall be configured to be displayed in either metric or US units.
 - g. Password Protected: The controller operator interface shall provide multi-level password protection, with user-defined, alphanumeric, name/password combinations. The operator interface shall return to lock mode after a user-defined log-off delay. A password icon shall indicate the lock mode state.
 - h. Settings: The operator interface shall provide a settings menu to view and configure date and time parameters such as the current time, time zone, and daylight savings time.

2.9. DDC CONTROLLERS

A. BAS Controllers:

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1. Provide BACnet Controllers that BACnet Testing Laboratory listed (v12 or later) as specified herein:
 - a. BACnet Building Controller (B-BC)
 - b. BACnet Advanced Application Controller (B-AAC)
 - c. BACnet Application Specific Controller (B-ASC)
2. All BACnet Controllers shall use the following communication specifications and achieve performance as specified herein:
 - a. All controllers shall be able to communicate peer-to-peer without the need for a Network Control Unit (NCU). Any controller on the MS/TP Data Link/Physical layer shall be able to act as a Master to allow for the exchange and sharing of data variables and messages with any other controller connected on the same communication cabling. Slave controllers are not acceptable.
 - b. Performance:
 - 1) Each BACnet MS/TP controller shall have a minimum of 64Kb of RAM and 384Kb of non-volatile flash memory.
 - 2) Each controller shall have a 32-bit microprocessor operating at 68 MHz and support a BACnet protocol stack in accordance with the ANSI/ASHRAE Standard 135-2008 and the BACnet Device Profile supported.
 - 3) Each BACnet controller on the BACnet MS/TP communications trunk shall provide a loading characteristic of minimum 1/8th Load.
 - 4) Manufacturers, who wish to supply Local Control Unit (LCU) and Terminal Control Unit (TCU) controllers with less than a 32-bit microprocessor and/or a MS/TP loading characteristic of greater than 1/8th Load, may do so as long as they only provide a maximum of 24 controllers on a single bus segment per NCU.
3. BACnet Controllers shall be provided for Unit Ventilators, Fan Coils, Heat Pumps, Variable Air Volume (VAV) Terminals and other applications as needed. The application control program shall be resident within the same enclosure as the input/output circuitry, which translates the sensor signals.
4. Local Control Units (LCU) and Terminal Control Units (TCU): Shall be fully programmable and the programming software shall have a library of pre-built, tested, and user re-definable control sequences for a wide range of typical HVAC applications. All control sequences programmed into the LCU and TCU shall be stored in non-volatile memory, which is not dependent upon the presence of a battery, to be retained.
5. BACnet Controllers shall communicate with the Network Control Unit (NCU) via a BACnet/IP connection at a baud rate of not less than 100 Mbps or via the RS485 MS/TP connection at a baud rate of not less than 76.8 kbps.
6. BACnet TCU to have a communications port for connecting a matching room temperature and/or humidity sensor and does not utilize any of the I/O points of the Controller.
7. Provide documentation for each device, with the following information at a minimum:

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- a. BACnet Device; MAC address, name, type and instance number.
- b. BACnet Objects; name, type and instance number.
8. Controllers shall have an enclosure appropriate for their environment as approved by the Engineer. Comply with NEMA enclosure requirements in Section 230511.
 - a. Outdoor Enclosures: Rated for operation at 0 to 150 deg F.
- B. Local Control Units (LCU): For primary systems (such as AHU, MAU, chiller, boiler, and water systems.)
 1. Local Control Units (LCU) shall be 32 bit microprocessor-based.
 - a. They shall also be multi-tasking, real-time digital control processors consisting of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules.
 - b. Controller size shall be sufficient to fully meet the requirements of this specification and the sequence of operations.
 2. Each LCU shall have sufficient memory, to support its own operating system and databases, including control processes, energy management applications, alarm management applications, historical/trend data for points specified, maintenance support applications, custom processes, and manual override monitoring.
 3. Each LCU shall support monitoring of the following types of inputs, without the addition of equipment outside the DDC Controller cabinet:
 - a. Analog inputs of 4-20 mA, 0-10 Vdc, thermistor and RTD in the range 0 to 350,000 ohm.
 - b. Digital inputs from dry contact closure, pulse accumulators, voltage sensing.
 - c. Each LCU shall be capable of providing the following control outputs without the addition of equipment outside the DDC controller cabinet:
 - 1) Digital outputs of 24 Vdc (contact closure for motor starters up to size 4).
 - 2) Analog outputs of 4-20 mA and 0-10 Vdc.
 4. LCU analog or universal input shall use a 16 bit A/D converter. Controllers with less than 16 bit A/D converters must provide all analog input sensors with 4-20ma transmitters.
 5. LCU analog or universal output shall use a 10 bit D/A converter.
 6. Each LCU shall have a minimum of 10% spare capacity for each point type for future point connection.
 - a. Provide all processors, power supplies and communication controllers complete so that the implementation of a point only requires the addition of the appropriate point input/output termination module and wiring.
 - b. As a minimum, provide one of each type of point available on the controller.
 7. Provide sufficient internal memory for the specified control sequences and have at least 25% of the memory available for future use.

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- 1) The operator interface shall consist of an icon-based, interactive backlit color display with navigable menus to display, edit and modify internal controller functions.
- b. The operator interface shall use color-codes with icons and text lists to indicate values and controller statuses.
- c. The operator interface shall, at a minimum, have the following functions:
 - 1) Points: The operator interface shall provide points list menus to view the inputs, setpoints, and output values such as hardware inputs/outputs, analog values, binary values, and multistate values.
 - a) The points list menus shall allow the operator to monitor, set, and override controller points and values.
 - b) A color-code shall be used to indicate the conditions and statuses of points displayed in the points list menus.
 - 2) Alarms: The operator interface shall provide a controller's alarms menu to view details of an alarm, to acknowledge the alarm, and to view the alarm history.
 - a) The alarm menu shall allow the operator to view the following type of alarms: active not acknowledged, active acknowledged, and inactive not acknowledged.
 - b) The combination of an icon and its color state shall notify the operator of an alarm condition.
 - c) The operator shall be able to select a single point in alarm to view further details such as the alarm to/from status, current status, event date and time, alarm event threshold, and alarm event value.
 - 3) Overrides: The operator interface shall provide an overrides menu to view a list of the controller's overridden points such as hardware input, hardware output, value, constant, or variable. The menu shall allow the operator to select an overridden point and to modify or release the override on the selected point.
 - 4) PID loops: The operator interface shall provide a PID Loops menu to view, configure, and adjust the PID parameters. The interface shall also provide visual PID tuning with live system response graphing (live-trend).
 - 5) The operator interface shall allow personalization of a contact information screen with a minimum of eight (8) lines of user configurable text as well as the option to add a color graphic such as a company logo. The tool shall support, but not be limited to; image file formats such as GIF, PNG, JPG, etc.
 - 6) Favorites: The operator interface shall allow access to a list of bookmarked points.
 - 7) Weather: The operator interface shall provide a weather menu to view the current weather conditions with a weather status icon. The units shall be configured to be displayed in either metric or US units.

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- 8) Password Protected: The controller operator interface shall provide multi-level password protection, with user-defined, alphanumeric, name/password combinations. The operator interface shall return to lock mode after a user-defined log-off delay. A password icon shall indicate the lock mode state.
 - 9) Settings: The operator interface shall provide a settings menu to view and configure date and time parameters such as the current time, time zone, and daylight savings time.
8. LCU shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all panel components.
 9. Should the LCU memory be lost for any reason, the user shall have the capability of reloading the controller software via the BAS LAN operator workstation or server.
 10. Provide an onboard network communication jack for connection to the network (RJ-45 or equivalent quick connect)
- C. Terminal Control Units (TCU): For secondary systems such as VAV, fan-powered VAV, fan coil, radiation, and reheat coils.
1. Provide Terminal Control Units (TCU) for control of each piece of terminal equipment.
 2. TCU controllers shall be powered from a 24 Vac source.
 3. Controllers shall also function normally under ambient conditions of 32 to 120 deg F and 5 to 90 percent RH (non-condensing).
 4. Provide each controller with a suitable cover or enclosure to protect the intelligence board assembly.
 5. Terminal Control Units (TCU) shall be 32 bit microprocessor-based.
 6. They shall be multi-tasking, real-time digital control processors consisting of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules.
 7. Each TCU shall have sufficient memory, to support its own operating system and databases, including: control processes, maintenance support applications, custom processes, and manual override monitoring.
 8. Each TCU shall support monitoring of the following types of inputs, without the addition of equipment:
 - a. Analog inputs of 4-20 mA, 0-10 Vdc, thermistor and RTD in the range 0 to 350,000 ohm.
 - b. Digital inputs from dry contact closure, pulse accumulators, voltage sensing.
 - c. Each TCU shall be capable of providing the following control outputs without the addition of equipment: digital outputs (contact closure for motor starters up to size 4) and analog outputs of 4-20 mA or 0-10 Vdc.
 9. TCU analog or universal input shall use a 16 bit A/D converter. Controllers with less than 16 bit A/D converters must provide all analog input sensors with 4-20ma transmitters.
 10. TCU analog or universal output shall use a 10 bit D/A converter.

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11. Controllers shall include all point inputs and outputs necessary to perform the specific control sequences.
 - a. As a minimum, 25% of the point outputs shall be of the universal type; that is, the outputs may be utilized either as modulating or two-state, allowing for additional system flexibility.
 - b. Analog outputs shall be industry standard signals such as 24V floating control, allowing for interface to a variety of modulating actuators.
 12. Each controller shall perform its primary control function independent of other NCU controller LAN communication, or if LAN communication is interrupted.
 - a. Reversion to a fail-safe mode of operation during LAN interruption is not acceptable.
 - b. The controller shall receive its real-time data from the NCU controller time clock to insure LAN continuity.
 - c. Each controller shall include algorithms incorporating proportional, integral, and derivative (PID) gains for all applications.
 - d. All PID gains and biases shall be field-adjustable by the user via terminals as specified herein.
 - e. This functionality shall allow for tighter control of space conditions and shall facilitate optimal occupant comfort and energy savings.
 13. Provide each TCU with sufficient memory to accommodate point databases, operating programs, local alarming and local trending.
 - a. All databases and programs shall be stored in non-volatile EEPROM, EPROM and PROM.
 - b. The controllers shall be able to return to full normal operation without user intervention after a power failure of unlimited duration.
 - c. Operating programs shall be field selectable for specific applications.
 - d. In addition, specific applications may be modified to meet the user's exact control strategy requirements, allowing for additional system flexibility.
 - e. Controllers that require factory changes of all applications are not acceptable.
- D. Variable Air Volume (VAV) Terminal Control Units (TCU):
1. VAV TCU controllers shall be powered from a 24 Vac source.
 2. The controllers shall also function normally under ambient conditions of 32 to 122 deg F and 5 to 90 percent RH (non-condensing).
 3. Provide each controller with a suitable cover or enclosure to protect the intelligence board assembly.
 4. VAV TCU shall include a built-in 'flow thru' differential pressure transducer.
 - a. The controller shall convert this value to actual air flow.
 - b. Single point differential pressure sensing device is not acceptable.
 - c. Membrane based pressure differential transducer is not acceptable.

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- d. VAV TCU differential pressure transducer shall have a measurement range of 0 to 2 inches wc and measurement accuracy of plus or minus 4 percent at 0.05 to 2 inches wc and a minimum resolution of 0.0001 inches wc, insuring primary air flow conditions shall be controlled and maintained to within plus or minus 5 percent of setpoint at the specified minimum and maximum air flow parameters.
- e. VAV TCU differential pressure transducer requiring periodic zero value air flow calibration is not acceptable.
- f. BAS contractor shall verify the type of differential pressure sensors used in the existing boxes, and ensure compatibility with the VAV TCU controllers.
- g. VAV TCU shall include provision for air flow balancing using a local air flow balancing interface.
- h. The portable air flow balancing interface shall connect to the VAV TCU or the matching room temperature sensor.
- i. VAV TCU shall also provide an air flow balancing tool. This tool shall allow the air balancer to manually control the action of the actuator including the following function: open VAV damper, close VAV damper, open all VAV dampers, and close all VAV dampers.
- j. Each controller shall also incorporate an algorithm that allows for resetting of the associated air handling unit discharge temperature if required to satisfy space requirements.
- k. It shall be possible to view and reset the space temperature, temperature setpoint, maximum airflow setting, minimum airflow setting, and actual airflow, through the BAS LAN.

2.10. ANALOG CONTROLLERS

- A. Step Controllers: 6 or 10-stage type, with heavy-duty switching rated to handle loads and operated by electric motor.
- B. Electric, Outdoor-Reset Controllers: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range, adjustable set point, scale range minus 10 to plus 70 deg F, and single- or double-pole contacts.
- C. Electronic Controllers: Wheatstone-bridge-amplifier type, in steel enclosure with provision for remote-resistance readjustment. Identify adjustments on controllers, including proportional band and authority.
- D. Fan-Speed Controllers: Solid-state model providing field-adjustable proportional control of motor speed from maximum to minimum of 55 percent and on-off action below minimum fan speed. Controller shall briefly apply full voltage, when motor is started, to rapidly bring motor up to minimum speed. Equip with filtered circuit to eliminate radio interference.
- E. Receiver Controllers: Single- or multiple-input models with control-point adjustment, direct or reverse acting with mechanical set-point adjustment with locking device, proportional band adjustment, authority adjustment, and proportional control mode.
 1. Remote-control-point adjustment shall be plus or minus 20 percent of sensor span, input signal of 3 to 13 psig.

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2. Proportional band shall extend from 2 to 20 percent for 5 psig.
3. Authority shall be 20 to 200 percent.
4. Air-supply pressure of 18 psig input signal of 3 to 15 psig, and output signal of zero to supply pressure.
5. Gages: 1 1/2-inch diameter, 2.5 percent wide-scale accuracy, and range to match transmitter input or output pressure.

2.11. ELECTRONIC SENSORS

- A. Description: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.
- B. Provide sensors as indicated in control diagrams and sequences of operation or as needed to perform the intended operations.
- C. Temperature Sensors:
 1. General Requirements:
 - a. Accuracy:
 - 1) Thermistor: Plus or minus 0.5 deg F at calibration point.
 - 2) RTD: Plus or minus 0.2 percent at calibration point.
 - b. Wire: Twisted, shielded-pair cable.
 2. Outside Air Temperature (OAT) Sensor: Thermistor or RTD compatible with BMS installed in wall-mounted weatherproof enclosure with conduit entrance and aluminum LB with PVC sun and windscreen.
 3. Duct-Mounted Single-Point Temperature Sensor: Thermistor or RTD compatible with BMS, sealed in 0.25-inch stainless steel probe of length between one-third and two-thirds of the duct width in duct-mounted metal housing with conduit entrance.
 - a. Single-point may be used in ducts less than 9 sqft. in cross-sectional area and in ducts greater than 9 sqft. in cross-sectional area if there is no heating coil and no cooling coil and no mixing of air flows of different temperature upstream.
 4. Duct-Mounted Averaging Element Temperature Sensor: Thermistor or RTD compatible with BMS, 36-inch averaging element.
 - a. Averaging elements shall be used where ducts are larger than 9 sqft. in cross-sectional area or where prone to stratification.
 5. Wall-Mounted Temperature Sensor: Thermistor or RTD compatible with BMS with insulated back.
 - a. Private Spaces: White plastic enclosure with set point adjustment, push button override switch, and LED display.
 - b. Public Spaces: Stainless steel plate sensor that fits in a standard 4-inch by 2-inch junction box with tamperproof screws.

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6. Wall-Mounted Microprocessor-Based Temperature Sensor: Thermistor or RTD compatible with BMS in white plastic enclosure with insulated back, LED display of space temperature and set point and push button override switch.
 7. Thermowell-Mounted Immersion Temperature Sensor: Thermistor or RTD compatible with BMS sealed in a probe with a three-part moisture protection system in a brass or stainless steel thermowell. Rigid 0.25-inch stainless steel probe that has minimum length of 20% of the pipe width. Metal (for indoor) or weatherproof (for outdoor applications) enclosure with conduit entrance.
- D. Humidity Sensors:
1. General: 4-20 mA two wire and 0-10 Vdc output proportional to relative humidity range of 0% to 100% and compatible with BMS and 24 Vac/dc power supply.
 - a. Accuracy: 2 percent over 5 to 95 percent range with linear output.
 - b. Temperature: 32 to 120 deg F.
 2. Wall-Mounted Relative Humidity Sensor: Laser-trimmed thermoset polymer-based capacitive-type sensor in white plastic enclosure with insulated back, set point adjustment, push button override switch, and LED display.
 - a. Range: 20 to 80 percent.
 3. Duct-Mounted Relative Humidity Sensor: Laser-trimmed thermoset polymer-based capacitive-type sensor with 9-inch long probe in duct-mounted metal housing with conduit entrance.
 - a. Range: 0 to 100 percent.
 4. Outside Air Relative Humidity (OAH) Sensor: Laser-trimmed thermoset polymer-based capacitive-type sensor with weatherproof enclosure with conduit entrance.
 - a. Range: 0 to 100 percent.
- E. Combination Relative Humidity and Temperature Sensors: Where there is a requirement for the monitoring of both relative humidity and temperature at the same location, provide combination relative humidity and temperature sensors. The individual sensors must each meet the specifications details herein.
- F. Pressure Sensors:
1. Duct-Mounted Static Pressure Sensors: Non-directional sensor with 4-20mA or 0-10Vdc output proportional to pressure input range compatible with BMS system.
 - a. Range: 0 to 6-inches wg for low and medium pressure applications and higher as approved for high pressure applications.
 - b. Accuracy: 2 percent of full scale output.
 - c. Temperature: 32 to 140 deg F.
 2. Room Pressure Sensors: Non-directional sensor with 4-20mA or 0-10Vdc output proportional to pressure input range compatible with BMS system.
 - a. Range: Minus 0.2-inches to positive 0.2-inches wg.
 - b. Accuracy: 2 percent of full scale output.
 - c. Temperature: 32 to 140 deg F.

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3. Air Filter / Coil Differential Pressure Sensors: Non-directional sensor with 4-20mA or 0-10Vdc output proportional to pressure input range compatible with BMS system. Sensors shall have a local display.
 - a. Range: 0 to 2-inches wg.
 - b. Accuracy: 2 percent of full scale output.
 - c. Temperature: 32 to 140 deg F.
4. Air Differential Pressure Switch: Snap-acting single-pole double-throw (SPDT) in NEMA 13 housing with automatic reset and set-point adjustment knob.
 - a. Range: 0 to 0.25-inches wg for building and duct pressurization applications; 0 to 1.50-inches wg for filter alarms; and 0 to 8-inches wg for high static alarms.
 - b. Accuracy: 2 percent of full scale output.
 - c. Temperature: 0 to 140 deg F.
5. Air Flow Sensors: Hot wire anemometer type sensor with 4-20 mA or 0-10Vdc output proportional to air flow speed and 24 Vac/dc power supply. Probe and transducer housing shall be constructed of durable PVC.
 - a. Range: 0 to 6-inches wg.
 - b. Accuracy: 5 percent of measured value.
 - c. Temperature: 0 to 140 deg F.
6. Water Pressure Sensors: Sensor with 4-20 mA output proportional to water pressure with stainless steel wetted parts in a weatherproof wiring housing. Sensors shall have over pressure input protection of minimum two times rated input and burst pressure of minimum five times rated input.
 - a. Range: 0 to two times the set point or anticipated pressure.
 - b. Accuracy: 0.25 percent of range.
 - c. Temperature: Minus 40 to positive 260 deg F.
7. Steam Pressure Sensors: Sensor with 4-20 mA output proportional to steam pressure with stainless steel wetted parts in a weatherproof wiring housing. Sensors shall have over pressure input protection of minimum two times rated input and burst pressure of minimum five times rated input.
 - a. Range: 0 to two times the set point or anticipated pressure.
 - b. Accuracy: 0.25 percent of range.
 - c. Temperature: 0 to 450 deg F.
8. Water Differential/Gage Pressure Sensors: Sensor with 4-20 mA or 0-10 Vdc output proportional to the pressure sensed with stainless steel wetted parts in a weatherproof wiring housing. Sensors shall have over pressure input protection of minimum five times rated input.
 - a. Range: 0 psig to 150 percent of maximum design pressure.
 - b. Accuracy: 1 percent of full-scale reading.
 - c. Temperature: Minus 40 to positive 260 deg F.

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G. Electronic Sensors:

1. Current Relays / Switches: Current relays shall be rated for their associated load; have input and output isolation via current transformer; and be self-powered with no insertion loss. The output relay shall have an accessible trip adjustment over its complete operating range. Provide LED indication of relay status. Relay shall be in a dustproof housing.
 - a. Accuracy: 2 percent of full scale.
 - b. Temperature: 0 to 140 deg F.
2. Current Sensor: Sensor with 4-20 mA, 0-10 or 0-5 Vdc output proportional to current draw and rated for 50/60 Hz operation.
 - a. Accuracy: 1 percent
 - b. Temperature: Minus 20 to positive 120 deg F.

2.12. STATUS SENSORS

- A. Status Inputs for Fans: Differential-pressure switch with pilot-duty rating and with adjustable range of 0- to 5-inch wg.
- B. Status Inputs for Pumps: Differential-pressure switch with pilot-duty rating and with adjustable pressure-differential range of 8 to 60 psig, piped across pump.
- C. Status Inputs for Electric Motors: Comply with ISA 50.00.01, current-sensing fixed- or split-core transformers with self-powered transmitter, adjustable and suitable for 175 percent of rated motor current.
- D. Voltage Transmitter (100- to 600-V ac): Comply with ISA 50.00.01, single-loop, self-powered transmitter, adjustable, with suitable range and 1 percent full-scale accuracy.
- E. Power Monitor: 3-phase type with disconnect/shorting switch assembly, listed voltage and current transformers, with pulse kilowatt hour output and 4- to 20-mA kW output, with maximum 2 percent error at 1.0 power factor and 2.5 percent error at 0.5 power factor.
- F. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.
- G. Electronic Valve/Damper Position Indicator: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.
- H. Water-Flow Switches: Snap-acting type with pilot-duty rating, stainless-steel or bronze paddle, with appropriate range and differential adjustment, in NEMA 250, Type 12 enclosure.

2.13. DETECTION EQUIPMENT

- A. Air Quality Sensors: Sensors that measure the volatile organic compounds (VOC) including: methane, ethylene, hydrogen, carbon monoxide (CO), propane and ammonia.
 1. Wall-Mounted Air Quality Sensors: Microprocessor based using a semiconductor element based on the Taguchi gas principle with 4-20 mA or 0-10 Vdc output and a 24 Vac/dc power supply in white plastic enclosure. Programming and selection via internal push buttons and jumpers.

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- a. Temperature: 32 to 120 deg F.
2. Duct-Mounted Air Quality Sensors: Microprocessor based using a semiconductor element based on the Taguchi gas principle with 8-inch duct probe, 4-20 mA or 0-10 Vdc output and a 24 Vac/dc power supply in white plastic enclosure. Programming and selection via internal push buttons and jumpers.
 - a. Temperature: 32 to 120 deg F.
- B. Carbon Dioxide (CO₂) Sensors: Microprocessor based sensor with 4-20 mA, 0-10 or 0-5 Vdc output compatible with BMS proportional to 0 to 2000 ppm of carbon dioxide concentration and 24 Vac/dc power supply.
 1. Accuracy: Plus or minus 50 ppm.
 2. Temperature: 32 to 120 deg F.
 3. Calibration: No maintenance or periodic sensor replacement needed. The sensor shall have a 5-year calibration interval, utilizing the Automatic Calibration Logic Program (ACLP).
- C. Carbon Monoxide (CO) Sensors: Electrochemical type sensor with 4-20mA or 0-10 Vdc output of Carbon Monoxide sensed compatible with BAS system. Unit shall be complete with 85 db audible alarm and have visual output reading via an LCD display of the gas sensed. Provide two (2) relay contacts, at minimum, per sensor, to indicate CO warning level (initially set at 50ppm) and CO alarm level (initially set at 100ppm) for each sensing point. The proposed sensor locations shall be submitted at the shop drawing stage and shall be amended as directed by the Owner and/or Engineer.
 1. Range: 5 percent accuracy from 0 to 300 ppm.
 2. Temperature: 32 to 120 deg F.
 3. Calibration: Factory calibrated and only requires calibration after a minimum one (1) year service.
- D. Oxygen Sensors: Solid-state zircon cell sensor with 4 to 20 mA output.
 1. Accuracy: 5 percent of reading.
 2. Temperature: 32 to 120 deg F.
- E. Water Leak Detection Alarm: Adjustable-height multi-point water detection sensor constructed to be corrosion and abrasion resistant and configured for normally open or normally closed as required by the application with 24Vac/dc power supply. Provide remote-mounted sensing probe and cable as needed for each application.
 1. Temperature: Minus 40 to positive 185 deg F.
- F. Occupancy Override Switch: Low-voltage wall switch in a standard single-switch back box with momentary switch, green LED "on" indicator light, with white plastic faceplate. Hubbell (LVSM series) or equal.
- G. Occupancy Sensor: Dual-technology passive infrared (PIR) and ultrasonic occupancy sensor with adjustable time delay of 5 to 45 minutes, daylight sensor lockout, sensitivity control, and 180-degree field of view with vertical sensing adjustment; for flush wall or ceiling mounting in standard metal outlet box. Provide sensor with LED light to indicate when motion is being detected during test and normal operation. Provide sensor with auxiliary dry contacts. Power supply to the sensor shall be 24Vdc, located within the outlet box and be plenum-rated.

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1. Subject to compliance with requirements, provide products by the following:
 - a. Ceiling-Mounted Sensors: Cooper Lighting/Eaton (MicroSet Series), Hubbell (OMNI Series), Leviton (OSC Series), Lutron (LOS C Series) or Watt Stopper (LMDC Series).

2.14. AIR FLOW MEASURING STATIONS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Air Monitor Corporation
 2. Ebtron
 3. Paragon Controls
 4. Tek-Air Systems
- B. Duct Air Flow Measuring Stations, Thermal Dispersion Type: Type 304 or 316 stainless steel sensing elements with multiple ports, 24Vac power and 4 to 20 mA signal. The sensing element shall be specifically designed to measure air flow in duct. Ebtron (Gold Series, Duct and Plenum) or equal.
 1. Accuracy: Plus or minus 3 percent at 100 to 5,000 fpm.
 2. Operating Conditions, Air Stream: Minus 20 to plus 200 deg F and 0 to 99 percent humidity, non-condensing.
 3. Pressure Drop: 0.20-inches wg at 4,000 fpm maximum.
 4. Noise Generation: NC-40 maximum, self-generated sound level.
- C. Fan Inlet Air Flow Measuring Stations, Thermal Dispersion Type: Type 304 or 316 stainless steel sensing elements with multiple ports, 24Vac power and 4 to 20 mA signal. The sensing element shall be specifically designed to measure air flow of a centrifugal fan at the inlet cone. For double-inlet fans, provide one set of elements for each inlet. Ebtron (Gold Series, Fan Inlet) or equal.
 1. Accuracy: Plus or minus 2 percent at 100 to 5,000 fpm.
 2. Operating Conditions, Air Stream: 32 to 140 deg F and 0 to 99 percent humidity, non-condensing.
 3. Pressure Drop: 0.20-inches wg at 4,000 fpm maximum.
 4. Noise Generation: NC-40 maximum, self-generated sound level.
- D. Transmitter: Heavy-duty construction with LED display with 4 to 20 mA air flow and temperature output signals and BACnet MS/TP RS-485 output for interface with the building automation system (BAS).

2.15. THERMOSTATS

- A. Combination Thermostat and Fan Switches: Line-voltage thermostat with push-button or lever-operated fan switch.

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1. Label switches "FAN ON-OFF", "FAN HIGH-LOW-OFF" or "FAN HIGH-MED-LOW-OFF" as applicable.
 2. Mount on single electric switch box.
- B. Electric, solid-state, microcomputer-based room thermostat with remote sensor.
1. Automatic switching from heating to cooling.
 2. Preferential rate control to minimize overshoot and deviation from set point.
 3. Set up for four separate temperatures per day.
 4. Instant override of set point for continuous or timed period from 1 hour to 31 days.
 5. Short-cycle protection.
 6. Programming based on weekday, Saturday, and Sunday.
 7. Selection features include degree F or degree C display, 12- or 24-hour clock, keyboard disable, remote sensor, and fan on-auto.
 8. Battery replacement without program loss.
 9. Thermostat display features include the following: time of day, actual room temperature, programmed temperature, programmed time, duration of timed override, day of week, and system mode indications include "heating," "off," "fan auto," and "fan on."
 10. Combination Thermostat, Humidistat, Carbon Dioxide, and/or Occupancy Sensor: Where there is a requirement for a thermostat with humidistat, carbon dioxide, and/or occupancy sensing functions at the same location, provide combination unit. The individual sensors must each meet the specifications details herein.
- C. Low-Voltage, On-Off Thermostats: NEMA DC 3, 24-V, bimetal-operated, mercury-free, with adjustable or fixed anticipation heater, concealed set-point adjustment, 55 to 85 deg F set-point range, and 2 deg F maximum differential.
- D. Line-Voltage, On-Off Thermostats: Bimetal-actuated, open contact or bellows-actuated, enclosed, snap-switch or equivalent solid-state type, with heat anticipator; listed for electrical rating; with concealed set-point adjustment, 55 to 85 deg F set-point range, and 2 deg F maximum differential.
1. Electric Heating Thermostats: Equip with off position on dial wired to break ungrounded conductors.
 2. Selector Switch: Integral, manual on-off-auto.
- E. Remote-Bulb Thermostats: On-off or modulating type, liquid filled to compensate for changes in ambient temperature; with copper capillary and bulb, unless otherwise indicated.
1. Bulbs in water lines with separate wells of same material as bulb.
 2. Bulbs in air ducts with flanges and shields.
 3. Averaging Elements: Copper tubing with either single- or multiple-unit elements, extended to cover full width of duct or unit; adequately supported.
 4. Scale settings and differential settings are clearly visible and adjustable from front of instrument.

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5. On-Off Thermostat: With precision snap switches and with electrical ratings required by application.
 6. Modulating Thermostats: Construct so complete potentiometer coil and wiper assembly is removable for inspection or replacement without disturbing calibration of instrument.
- F. Fire-Protection Thermostats: Listed and labeled by an NRTL acceptable to authorities having jurisdiction; with fixed or adjustable settings to operate at not less than 75 deg F above normal maximum operating temperature, and the following:
1. Reset: Automatic, with control circuit arranged to require manual reset at central control panel; with pilot light and reset switch on panel labeled to indicate operation.
- G. Immersion Thermostat: Remote-bulb or bimetal rod-and-tube type, proportioning action with adjustable throttling range and adjustable set point.
- H. Airstream Thermostats: Two-pipe, fully proportional, single-temperature type; with adjustable set point in middle of range, adjustable throttling range, plug-in test fitting or permanent pressure gage, remote bulb, bimetal rod and tube, or averaging element.
- I. Electric, Low-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual automatic reset switch that trips if temperature sensed across any 12 inches of bulb length is equal to or below set point.
1. Bulb Length: Minimum 20 feet.
 2. Quantity: One thermostat for every 20 sqft. of coil surface.
- J. Electric, High-Limit Duct Thermostat: Snap-acting, single-pole, single-throw, manual automatic reset switch that trips if temperature sensed across any 12 inches of bulb length is equal to or above set point.
1. Bulb Length: Minimum 20 feet.
 2. Quantity: One thermostat for every 20 sqft. of coil surface.
- K. Heating/Cooling Valve-Top Thermostats: Proportional acting for proportional flow, with molded-rubber diaphragm, remote-bulb liquid-filled element, direct and reverse acting at minimum shutoff pressure of 25 psig and cast housing with position indicator and adjusting knob.

2.16. ACTUATORS

- A. Manufacturers: All valve actuators shall be supplied from a single manufacturer. All damper actuators shall be supplied from a single manufacturer. Provide actuators manufactured by one of the following:
1. Belimo
 2. Honeywell
 3. Johnson Controls
 4. Siemens
- B. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
1. Comply with requirements in Section 230513.

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2. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.
 3. Non-Spring-Return Motors for Valves Larger Than 2 1/2-inch NPS: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
 4. Spring-Return Motors for Valves Larger Than 2 1/2-inch NPS: Size for running and breakaway torque of 150 in. x lbf.
 5. Non-Spring-Return Motors for Dampers Larger Than 25 sqft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
 6. Spring-Return Motors for Dampers Larger Than 25 sqft.: Size for running and breakaway torque of 150 in. x lbf.
- C. Electronic Actuators: Direct-coupled type with stroke indicator and designed for minimum 60,000 full-stroke cycles at rated torque.
1. Valves: Size for torque required for valve close off at maximum pump differential pressure.
 2. Dampers: Size for running torque calculated as follows:
 - a. Parallel-Blade Damper with Edge Seals: 7 inch-lb/sqft. of damper.
 - b. Opposed-Blade Damper with Edge Seals: 5 inch-lb/sqft. of damper.
 - c. Parallel-Blade Damper without Edge Seals: 4 inch-lb/sqft. of damper.
 - d. Opposed-Blade Damper without Edge Seals: 3 inch-lb/sqft. of damper.
 - e. Dampers with 2- to 3-Inch wg of Pressure Drop or Face Velocities of 1000 to 2500 fpm: Increase running torque by 1.5.
 - f. Dampers with 3- to 4-Inch wg of Pressure Drop or Face Velocities of 2500 to 3000 fpm: Increase running torque by 2.0.
 3. Coupling: V-bolt and V-shaped, toothed cradle.
 4. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
 5. Fail-Safe Operation: Mechanical, spring-return mechanism. Provide external, manual gear release on non-spring-return actuators.
 6. Power Requirements:
 - a. Two-Position Spring Return: 24Vac.
 - b. Modulating: Maximum 10 VA at 24-V ac or 8 W at 24-V dc.
 7. Proportional Signal: 2- to 10-V dc or 4 to 20 mA, and 2- to 10-V dc position feedback signal.
 8. Temperature Rating:
 - a. Standard Dampers and Valves: Minus 22 to plus 122 deg F.
 - b. Smoke Dampers: Minus 22 to plus 250 deg F.
 9. Run Time:

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- a. Normal: 120 seconds open or closed.
 - b. Fast-Acting: 12 seconds open, 5 seconds closed unless otherwise noted.
 - 1) Smoke Control System Components
 - 2) Emergency System Components
 - 3) Fuel Shut-Off Valves
10. Housing: Minimum NEMA Type 2, mounted in any orientation, for indoor locations and NEMA Type 3R, mounted in any orientation, for outdoor locations.

2.17. CONTROL VALVES

- A. General: Refer to Section 230523 for general information about valve construction and installation.
- B. Hydronic Systems: Standard linear flow control valves shall be used for all modulating, two-position and three-way applications.
 1. Globe-Style Control Valves:
 - a. Types:
 - 1) Standard (Pressure Dependent) Linear Flow Control Valves: Factory fabricated, pressure dependent, characterized ball type control valves. Belimo (CCV Series), Griswold (Unimizer Series), Honeywell (VB Series), Johnson Controls (VG1000 Series) or Schneider Electric (VBB/VBS Series).
 - b. Descriptions:
 - 1) 2-Inch NPS and Smaller: Class 250 bronze body, bronze trim, rising stem, renewable composition disc, and screwed ends with backseating capacity repackable under pressure.
 - 2) 2 1/2-Inch NPS and Larger: Class 125 iron body, bronze trim, rising stem, plug-type disc, flanged ends, and renewable seat and disc.
 - c. Internal Construction: Replaceable plugs and stainless-steel or brass seats.
 - 1) Single-Seated Valves: Cage trim provides seating and guiding surfaces for plug on top and bottom.
 - 2) Double-Seated Valves: Balanced plug; cage trim provides seating and guiding surfaces for plugs on top and bottom.
 - d. Sizing:
 - 1) Two Position: Line size or size using a 1 psig pressure differential.
 - 2) Two-Way Modulating: Size using 3 psig or twice the load pressure drop, whichever is greater.
 - 3) Three-Way Modulating: Twice the load pressure drop, but not more than 3 psig.
 - e. Flow Characteristics: Two-way valves shall have equal percentage characteristics. Three-way valves shall have linear characteristics.

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- f. Close-Off (Differential) Pressure Rating: Combination of actuator and trim shall provide minimum close-off pressure rating of 150 percent of total system (pump) head for two and three-way valves.
- 2. Butterfly-Style Control Valves:
 - a. Standard (Pressure Dependent) Linear Flow Control Valves: Factory fabricated, pressure dependent, butterfly type control valves. Belimo (HD Series), Honeywell (VFF Series), Johnson Controls (VF Series) or Schneider Electric (VF Series).
 - b. Descriptions:
 - 1) 2 to 12-Inch NPS: Class 125/150 cast-iron full-lugged body, stainless steel disc, EPDM seat and extended neck. Disc-to-stem connection shall utilize an internal spline.
 - 2) 14-Inch NPS and Larger: Class 125/150 cast-iron full-lugged body, stainless steel disc, EPDM seat and extended neck. Disc-to-stem connection shall utilize a dual-pin method.
 - c. Sizing:
 - 1) Two Position: Line size or size using a 1 psig pressure differential.
 - 2) Two-Way Modulating: Size using 3 psig or twice the load pressure drop, whichever is greater. Size for the design flow with the disc at 60-degree open position and the design velocity less than 12 FPS.
 - d. Close-Off (Differential) Pressure Rating: Minimum close-off pressure rating of 200 psig bubble-tight for 2 to 12-inch NPS and 150 psig bubble tight for 14-inch NPS and larger.
- 3. Hydronic Control Valve Applications:
 - a. Heating and Cooling Coils:
 - 1) 2-Way Modulating: Pressure independent globe-type valves.
 - 2) 3-Way Modulating and 2-Way 2-Position: Pressure dependent globe-type valves.
 - b. Isolation Valves:
 - 1) 2-Inches NPS and Smaller: Globe-type.
 - 2) 2 1/2-Inches NPS and Larger: Butterfly type.
- C. Steam Systems:
 - 1. Globe-Style Control Valves:
 - a. Standard (Pressure Dependent) Linear Flow Control Valves: Factory fabricated for steam service, pressure dependent, globe-type control valves with stainless steel trim, plug, seat and stem; Teflon packing; and replicable composition or stainless steel filled PTFE. Armstrong, Johnson Controls, Schneider Electric, or Spirax-Sarco.
 - b. Descriptions:

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- 1) 2-Inch NPS and Smaller: Class 250 bronze body with stainless steel seat, stem and plug, and a TFE packing.
 - 2) 2 1/2-Inch NPS and Larger: Class 250 bronze body with stainless steel seat, stem and plug, and a TFE V-ring packing.
- c. Sizing:
- 1) Two Position: Line size or size using 10 percent of inlet design pressure.
 - 2) Two-Way Modulating: For inlet pressure of 15 psig or less, the pressure drop shall be 80 percent of inlet design pressure. For inlet pressure higher than 15 psig, the pressure drop shall be 42 percent of inlet design pressure.
- d. Flow Characteristics: Linear or equal percentage characteristics.
- e. Working Temperatures:
- 1) Less than 15 psig: 250 deg F.
 - 2) 15 psig to 150 psig: 366 deg F.
- f. Close-Off (Differential) Pressure Rating: Combination of actuator and trim shall provide minimum close-off pressure rating of 150 percent of operating inlet design pressure.

2.18. ELECTRIC CONTROL COMPONENTS

- A. Limit Switches: Single-pole double-throw (SPDT) or double-pole double-throw (DPDT) type, UL-listed with adjustable trim arm.
- B. Control Relays: Rated for application, UL-listed, and mounted in NEMA 1 enclosure for indoor locations and NEMA 4 for outdoor with pilot light indicator of power-to-coil.
 1. Time Delay Relays: Capable of on or off delay functions with adjustable timing periods, cycle timing light with solid state, plug-in type coils with transient suppression devices.
- C. Control Transformers: Rated for application, UL- Class 2 listed, and mounted in NEMA 1 enclosure for indoor locations and NEMA 4 for outdoor with replaceable fuses on the primary and secondary side. Transformers shall be sized so that connected load does not exceed 75 percent of rating.
- D. Power Contactors: NEMA ICS 2 AC general purpose magnetic contactor mounted in NEMA 1 enclosure for indoor locations and NEMA 4 for outdoor.

2.19. CONTROL CABLE

- A. Electronic and fiber-optic cables for control wiring shall comply with Section 230511. All new Conduit will be blue in color. All communication wire will have a purple jacket.

2.20. ELECTRICAL CONNECTIONS

- A. Provide 24V transformers for all control equipment fed by low-voltage (100 to 600 V) power feeders. Coordinate the exact requirements with the Electrical Contractor.

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- B. Comply with the requirements of Section 230511.

PART 3 - EXECUTION

3.1. EXAMINATION

- A. Verify that power supply is available to control units.
- B. Verify that duct, pipe, and equipment-mounted devices are installed before proceeding with installation.

3.2. INSTALLATION

- A. Install software in control units and Server. Implement all features of programs to specified requirements and as appropriate to sequence of operation.
- B. Connect and configure equipment and software to achieve sequence of operation specified.
- C. Verify location of thermostats, humidistats, and other exposed control sensors with Drawings and room details before installation. Install devices 48 inches above the floor per ADA requirements. The location(s) to be selected by the Engineer. No sensor shall be mounted until the Engineer/Architect gives specific location instructions.
 - 1. Install averaging elements in ducts and plenums in crossing or zigzag pattern.
 - 2. Air seal wires attached to sensors in their raceways or in the wall to prevent sensor readings from being affected by air transmitted from other areas.
 - 3. Use averaging sensors in mixing plenums and hot and cold decks. Install averaging sensors in a serpentine manner vertically across duct. Support each bend with a capillary clip.
 - 4. Install mixing plenum low-limit sensors in a serpentine manner horizontally across duct. Support each bend with a capillary clip. Provide 1 foot of sensing element for each 1 square-foot of coil area.
 - 5. Install pipe-mounted temperature sensors in wells. Install liquid temperature sensors with heat-conducting fluid in thermal wells.
 - 6. Install outdoor air temperature sensors on north wall at designated location with sun shield.
- D. Install guards on thermostats in the following locations:
 - 1. Where indicated.
- E. Differential Air Static Pressure.
 - 1. Supply Duct Static Pressure. Pipe high-pressure tap to duct using a pitot tube. Make pressure tap connections according to manufacturer's recommendations.
 - 2. Return Duct Static Pressure. Pipe high-pressure tap to duct using a pitot tube. Make pressure tap connections according to manufacturer's recommendations.

**DPS HVAC Controls Replacement for:
Lakeview School
DURHAM PUBLIC SCHOOLS**

3. Building Static Pressure. Pipe pressure sensor's low-pressure port to the static pressure port located on the outside of the building through a high-volume accumulator. Pipe high-pressure port to a location behind a thermostat cover.
 4. Piping to pressure transducer pressure ports shall contain a capped test port adjacent to transducer.
 5. Pressure transducers, except those controlling VAV boxes, shall be located in control panels, not on monitored equipment or on ductwork. Mount transducers in a vibration-free location accessible for service without use of ladders or special equipment.
 6. Mount gauge tees adjacent to air and water differential pressure taps. Install shut-off valves before tee for water gauges.
- F. Damper Actuators, Electric or Electronic
1. Mount actuators directly on damper shaft or jackshaft unless shown as a linkage installation.
 2. Link actuators according to manufacturer's recommendations.
 3. For low-leakage dampers with seals, mount actuator with a minimum 5° travel available for damper seal tightening.
 4. To compress seals when spring-return actuators are used on normally closed dampers, power actuator to approximately the 5° open position, manually close the damper, and then tighten linkage.
 5. Check operation of damper-actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.
 6. Provide necessary mounting hardware and linkages for actuator installation.
 7. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.
- G. Valve Actuators: Connect actuators to valves with adapters approved by actuator manufacturer.
- H. Install labels and nameplates to identify control components according to Section 230553.
- I. Install hydronic instrument wells, valves, and other accessories according to Section 232116.
- J. Smoke detectors, high and low limit thermostats, high-pressure cut-offs, and other safety switches shall be hard-wired to de-energize equipment as described in the sequence of operation. Switches shall require manual reset. Provide contacts that allow DDC software to monitor safety switch status.
- K. Install flow switches with correct paddle for pipe diameter. Adjust flow switch according to manufacturer's instructions.
- L. Provide current sensing relays at the MCC starters.
- M. Install carbon monoxide (CO) monitoring systems as indicated.
1. Provide CO monitoring systems for the enclosed levels of the parking garage. Provide complete coverage of the enclosed levels of the parking garage and provide systems for each level. A CO monitoring system shall not cover an area on more than one level and the failure of any component shall not affect more than one level.

**DPS HVAC Controls Replacement for:
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2. Locate sensing points on walls and columns at 5 to 6 feet above floor level. Locate one sensing point per 7500 square-feet. Do not locate sensing points closer than 6ft to traffic lanes.
- N. Install air flow measuring stations in locations indicated and required to perform the sequences of operation. Install stations in accordance to the manufacturer's recommendations.
1. Do not install air flow measuring station sensors and probes until all sanding and grinding activities are complete to protect them from accumulating dust and debris.

3.3. ELECTRICAL WIRING AND CONNECTION INSTALLATION

- A. Extend 120V power circuits from points provided to control voltage transformers. Where dedicated junction boxes have been provided, coordinate the exact locations with the Electrical Contractor. Where they have not, coordinate the spare circuit breakers to be used with the Electrical Contractor or Owner.
- B. Install raceways, boxes, and cabinets according to Section 230511.
- C. Install building wire and cable according to Section 230511.
- D. Install signal and communication cable according to Section 230511. Comply with manufacturer's installation guidelines.
1. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.
 2. Install exposed cable in raceway.
 3. Install concealed cable in raceway.
 4. Bundle and harness multi-conductor instrument cable in place of single cables where several cables follow a common path.
 5. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
 6. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
 7. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.
- E. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.
- F. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

3.4. FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

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1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
 2. Test and adjust controls and safeties.
 3. Test calibration of electronic controllers by disconnecting input sensors and stimulating operation with compatible signal generator.
 4. Test each point through its full operating range to verify that safety and operating control set points are as required.
 5. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.
 6. Test each system for compliance with sequence of operation.
 7. Test software and hardware interlocks.
- B. DDC Verification:
1. Verify that instruments are installed before calibration, testing, and loop or leak checks.
 2. Check instruments for proper location and accessibility.
 3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
 4. Check instrument tubing for proper fittings, slope, material, and support.
 5. Check installation of air supply for each instrument.
 6. Check flow instruments. Inspect tag number and line and bore size, and verify that inlet side is identified and that meters are installed correctly.
 7. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
 8. Check temperature instruments and material and length of sensing elements.
 9. Check control valves. Verify that they are in correct direction.
 10. Check DDC system as follows:
 - a. Verify that DDC controller power supply is from emergency power supply, if applicable.
 - b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
 - c. Verify that spare I/O capacity has been provided.
 - d. Verify that DDC controllers are protected from power supply surges.
 - e. Verify all control valves have been installed at the correct locations.
 - f. Verify all control dampers have been installed at the correct locations.
- C. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.5. ADJUSTING

**DPS HVAC Controls Replacement for:
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- A. Manufacturer's Field Service: Engage a factory-authorized service representative to Calibrate components and equipment installation. Report results in writing
- B. Calibrating and Adjusting:
 - 1. Calibrate instruments.
 - 2. Make three-point calibration test for both linearity and accuracy for each analog instrument.
 - 3. Calibrate equipment and procedures using manufacturer's written recommendations and instruction manuals. Use test equipment with accuracy at least double that of instrument being calibrated.
 - 4. Control System Inputs and Outputs:
 - a. Check analog inputs at 0, 50, and 100 percent of span.
 - b. Check analog outputs using milli-ampere meter at 0, 50, and 100 percent output.
 - c. Check digital inputs using jumper wire.
 - d. Check digital outputs using ohmmeter to test for contact making or breaking.
 - e. Check resistance temperature inputs at 0, 50, and 100 percent of span using a precision-resistant source.
 - 5. Flow:
 - a. Set differential pressure flow transmitters for 0 and 100 percent values with 3-point calibration accomplished at 50, 90, and 100 percent of span.
 - b. Manually operate flow switches to verify that they make or break contact.
 - 6. Pressure:
 - a. Calibrate pressure transmitters at 0, 50, and 100 percent of span.
 - b. Calibrate pressure switches to make or break contacts, with adjustable differential set at minimum.
 - 7. Temperature:
 - a. Calibrate resistance temperature transmitters at 0, 50, and 100 percent of span using a precision-resistance source.
 - b. Calibrate temperature switches to make or break contacts.
 - 8. Stroke and adjust control valves and dampers without positioners, following the manufacturer's recommended procedure, so that valve or damper is 100 percent open and closed.
 - 9. Stroke and adjust control valves and dampers with positioners, following manufacturer's recommended procedure, so that valve and damper is 0, 50, and 100 percent closed.
 - 10. Provide diagnostic and test instruments for calibration and adjustment of system.
 - 11. Provide written description of procedures and equipment for calibrating each type of instrument. Submit procedures review and approval before initiating startup procedures.

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- C. Adjust initial temperature and humidity set points.
- D. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to six visits to Project during other than normal occupancy hours for this purpose.

3.6. DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls. This training will take place prior to Commissioning. Training will provide site specific information. Including but not limited to:
 - 1. Asbuilts
 - 2. Startup and calibration report
 - 3. How to replace controllers in the system
 - 4. Software required to manipulate the system including programming

3.7. COMMISSIONING

- A. Contractors will provide 40 hours of support per school to the Commissioning Agent for support during the Functional Testing of the Systems.

3.8. SOFTWARE BACK-UPS

- A. Upon completion including final adjustments, provide two (2) complete back-up electronic copies of software files for each school. The software files shall include all data and software files needed to completely reset or re-install the software for the entire project including a text file with a written description of the reinstall process. Each copy shall be saved to an external hard drive.
 - 1. External Hard Drive: 2 TB, 3.0/2.0 USB, portable hard-drive manufactured by Seagate, Toshiba or Western Digital.
 - 2. All software required to operate, maintain or program the system becomes the property of the owner

3.9. SOFTWARE UPDATES

- A. At 12-months from the date of Substantial Completion, update the BAS software to the most recent release. The update(s) shall be scheduled with the Owner and performed under their direct supervision. Verify proper operation after the installation and correct any problems created by the installation process.
 - 1. Software update shall include all labor, licensing and associated fees.

END OF SECTION 23 09 00

**DPS HVAC Controls Replacement for:
Lakeview School
DURHAM PUBLIC SCHOOLS**

SECTION 23 21 16 - HYDRONIC PIPING SPECIALTIES

PART 1 - GENERAL

1.1. SUMMARY

- A. Section includes special-duty valves and specialties for hydronic piping systems.

1.2. ACTION SUBMITTALS

- A. Product Data: For each type of the following:
 - 1. Valves: Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
 - 2. Air-control devices.
 - 3. Hydronic specialties.

1.3. CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air-control devices, hydronic specialties, and special-duty valves to include in emergency, operation, and maintenance manuals.

1.4. QUALITY ASSURANCE

- A. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
 - 1. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

PART 2 - PRODUCTS

2.1. GENERAL REQUIREMENTS

- A. Manufacturers: Subject to compliance with requirements, provide specialty valves, air vents, tanks and strainers by the following, unless otherwise noted:
 - 1. Amtrol
 - 2. Armstrong
 - 3. Bell & Gossett
 - 4. TACO

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2.2. PRESSURE REDUCING VALVES

- A. Diaphragm-Operated, Pressure-Reducing Valves: Bronze or brass body diaphragm-operated pressure reducing valves with PTFE disc, brass seat, EPT diaphragm, EPDM O-ring stem seals, low inlet pressure check valve, inlet strainer that is removable without system shutdown and non-corrosive valve seat and stem and ASME labeled. Valve size, capacity and operating pressure shall be selected to suit system. Operating pressure and capacity shall be factory-set and field adjustable.

2.3. SAFETY RELIEF VALVES

- A. Diaphragm-Operated Safety Relief Valves: Bronze or brass body diaphragm-operated safety relief valves with PTFE disc, brass seat, EPT diaphragm, EPDM O-ring stem seals, brass and rubber internal wetted working parts, inlet strainer that is removable without system shutdown and non-corrosive valve seat and stem and ASME labeled. Valve size, capacity and operating pressure shall be selected to suit system. Operating pressure and capacity shall be factory-set and field adjustable.

2.4. AIR-CONTROL DEVICES

- A. Manual Air Vents: Manual air vent with bronze body, non-ferrous internal parts, screwdriver or thumbscrew operator, 1/2-inch NPS inlet connection and 1/8-inch outlet connection and rated for 150 psig CWP (cold working pressure) and up to 225 deg F operating temperature.
- B. Automatic Air Vents: Automatic air vent with bronze body, non-ferrous internal parts, non-corrosive metal float operator, 3/4-inch NPS inlet connection and 1/4-inch outlet connection and rated for 150 psig CWP (cold working pressure) and up to 240 deg F operating temperature.
- C. Compression Expansion Tanks: Factory-fabricated welded steel compression-type expansion tank with taps in the bottom for tank fitting and in an end for gage glass. Tanks shall be rated for 125 psig working pressure and 375 deg F maximum operating temperature and labeled according to ASME Boiler and pressure Vessel Code Section VIII, Division 1.
 - 1. Air-Control Tank Fitting: Cast-iron body, copper-plated tube, brass vent tube plug, and stainless-steel ball check, 100-gallon unit only; sized for compression-tank diameter. Provide tank fittings for 125-psig working pressure and 250 deg F maximum operating temperature.
 - 2. Tank Drain Fitting: Brass body, nonferrous internal parts; 125-psig working pressure and 240 deg F maximum operating temperature; constructed to admit air to compression tank, drain water, and close off system.
 - 3. Gage Glass: Full height with dual manual shutoff valves, 3/4-inch diameter gage glass, and slotted-metal glass guard.
- D. Diaphragm Expansion Tanks: Factory-fabricated welded steel diaphragm-type expansion tank with taps for pressure gage, air charge fitting and drain fitting. Tanks shall be rated for 125 psig working pressure and 375 deg F maximum operating temperature and labeled according to ASME Boiler and pressure Vessel Code Section VIII, Division 1.
 - 1. Diaphragm: Securely sealed into tank to separate air charge from system water to maintain required expansion capacity.

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2. Air-Charge Fittings: Schrader valve, stainless steel with EPDM seats.
- E. Bladder Expansion Tanks: Factory-fabricated welded steel bladder-type expansion tank with taps for pressure gage, air charge fitting and drain fitting. Tanks shall be rated for 125 psig working pressure and 375 deg F maximum operating temperature and labeled according to ASME Boiler and pressure Vessel Code Section VIII, Division 1.
 1. Bladder: Securely sealed into tank to separate air charge from system water to maintain required expansion capacity.
 2. Air-Charge Fittings: Schrader valve, stainless steel with EPDM seats.
- F. Tangential-Type Air Separators: Factory-fabricated welded steel tangential-type air separators with perforated stainless steel air collector tube; threaded inlet and outlet connections for 2-inch NPS and smaller and flanged for 2 1/2-inch and larger; and threaded blowdown connection. Separators shall be rated for 125 psig working pressure and 375 deg F maximum operating temperature and ASME labeled. Separators shall be sized for maximum system flow or larger as scheduled.
- G. Coalescing Air and Sediment Separators: Factory-fabricated welded steel coalescing-type air and sediment/dirt separators with removable head and coalescing material; threaded inlet and outlet connections for 2-inch NPS and smaller and flanged for 2 1/2-inch and larger; and threaded blowdown connection. Separators shall be rated for 125 psig working pressure and 375 deg F maximum operating temperature and ASME labeled. Separators shall be sized for maximum system flow or larger as scheduled. Bell & Gossett CRS series, Spirotherm Spirovent Drain series or TACO 4900 series.
- H. Centrifugal Separators:

2.5. HYDRONIC PIPING SPECIALTIES

- A. Y-Pattern Strainers: Y-pattern strainer with cast-iron body, bolted cover and bottom drain connection; threaded end connections for 2-inch NPS and smaller and flanged for 2 1/2-inch and larger; medium-straining mesh stainless steel strainer screen; and rated for 125 psig CWP (cold working pressure).
- B. Basket Strainers: Basket strainers with cast-iron body, bolted cover and bottom drain connection; threaded end connections for 2-inch NPS and smaller and flanged for 2 1/2-inch and larger; fine-straining mesh stainless steel start-up strainer; medium-straining perforated stainless steel basket with 50-percent free area; and rated for 125 psig CWP (cold working pressure).
- C. Stainless-Steel Bellow Flexible Connectors: Flexible connector constructed of stainless steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket; capable of 3/4-inch misalignment; threaded end connections for 2-inch NPS and smaller and flanged for 2 1/2-inch and larger; and rated for 150 psig CWP (cold working pressure) and 250 deg F maximum operating temperature.
- D. Spherical-Rubber Flexible Connectors: Flexible connector constructed of fiber-reinforced rubber; capable of misalignment; Class 150 flanged end connections; and rated for 150 psig CWP (cold working pressure) and 250 deg F maximum operating temperature.
 1. Base-Mounted Pump Connections: Provide flexible connectors with galvanized elongation limiting cables. MetraFlex Cablesphere Series or equal.

**DPS HVAC Controls Replacement for:
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DURHAM PUBLIC SCHOOLS**

2.6. ESCUTCHEONS AND FLOOR PLATES

- A. Escutcheons:
 - 1. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
 - 2. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
 - 3. Split-Casting Brass Type: With polished, chrome-plated finish and with concealed hinge and setscrew.
- B. Floor Plates:
 - 1. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.
 - 2. Split-Casting Floor Plates: Cast brass with concealed hinge.

PART 3 - EXECUTION

3.1. VALVE APPLICATIONS

- A. Install safety valves at hot-water generators and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install drip-pan elbow on safety-valve outlet and pipe without valves to the outdoors; pipe drain to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, for installation requirements.
- B. Install pressure-reducing valves at makeup-water connection to regulate system fill pressure.

3.2. HYDRONIC SPECIALTIES INSTALLATION

- A. Install automatic air vents at high points of system piping in mechanical equipment rooms only. Install manual vents at heat-transfer coils and elsewhere as required for air venting.
- B. Install piping from boiler air outlet, air separator to expansion tank with a 2 percent upward slope toward tank.
- C. Install tangential air separator in pump suction. Install blowdown piping with gate or full-port ball valve; extend full size to nearest floor drain.
- D. Install coalescing-type air and sediment separator in pump suction with wye-type strainer immediately upstream. Install blowdown piping with gate or full-port ball valve; extend full size to nearest floor drain.
- E. When indicated, install expansion tanks above the air separator. Install tank fitting in tank bottom and charge tank. Use manual vent for initial fill to establish proper water level in tank.
 - 1. Install tank fittings that are shipped loose.

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DURHAM PUBLIC SCHOOLS**

2. Support tank from floor or structure above with sufficient strength to carry weight of tank, piping connections, fittings, plus tank full of water. Do not overload building components and structural members.
- F. When indicated, install expansion tanks on the floor. Vent and purge air from hydronic system, and ensure that tank is properly charged with air to suit system Project requirements.

3.3. ESCUTCHEONS AND FLOOR PLATES INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
1. New Piping: Install one-piece cast-brass type for new piping installations. Install deep-pattern type where piping sleeve protrudes from the floor or wall.
 2. Existing Piping: Install split-casting brass type for existing piping installations.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
1. New Piping: One-piece, floor-plate type.
 2. Existing Piping: Split-casting, floor-plate type.
- E. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 23 21 16

Durham Public Schools
Lakeview Gymnasium Addition
Durham, NC



Morrisville, NC
2600 Perimeter Park Drive
Suite 150
Morrisville, NC 27560
919-388-1800

Contractor: Climate Control, Inc.
Project Number: RC10C1001

APPENDIX

Drawing Index:

General Wiring Details	Page 1
UNC Panel Detail	Page 2
Roof Top Unit	Page 3
Exhaust Fans / Emergency Stop	Page 4

Revisions			
Rev	Description:	Date:	By:
0	Preliminary_P1	04-26-10	TLR
1	Submittal_S2	04-27-10	TLR
2	As-Built_R3	11-03-10	TLR

GENERAL WIRING (Network 8000)

- All wiring must be done in accordance with the control wiring diagrams and in compliance with the National Electric Code, state and local codes and ordinances, and the job specification.
- All wiring installation practices must conform to guidelines listed in the Network 8000 Hardware Installation Practices Manual.
- Wiring between devices should be installed using a continuous run of wire, avoid splices.
- High voltage cables (over 30vac or 30vdc) shall not be run in the same conduit as point wiring (AI, DI, AO) and LAN line wiring. A separate conduit shall be installed.
- High voltage cables (over 30vac or 30vdc) shall not be routed through the left side of the GCM/LCM/MZII sub-base.
- All equipment requiring a line power source shall be on a dedicated circuit.
- All DDC panels require an equipment ground. The ground wire should be connected to the ground bus bar in the power panel that supplies power to the DDC panel. Metal raceway (conduit, wiremold, etc.) shall not be used as the grounding source.

AI, DI, AO POINT WIRING

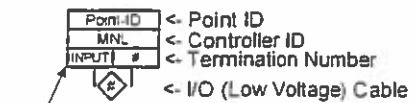
- All external devices shall be connected to the controllers using 18AWG stranded color coded twisted shielded pair cable. This cables capacitance between any one conductor and other conductors connected to the shield should be no greater than 60pF per foot with a maximum distance as listed.
- For non-plenum cable use Belden 8760 or equivalent. Where plenum rated cable is required use Belden 82760 or equivalent.
- Each connected device requires a separate signal and return conductor.

DO POINT WIRING

- All external devices shall be connected using a minimum of 18AWG cable.
- Digital Output wiring cannot be intermixed with power wiring and other types of Class 2 wiring.
- When powering multiple Class 2 devices from the same transformer polarity must be observed (24H connected to 24H and 24G connected to 24G) and the transformer frame must be grounded.

BAS I/O Points Legend

Input/Output Termination Legend



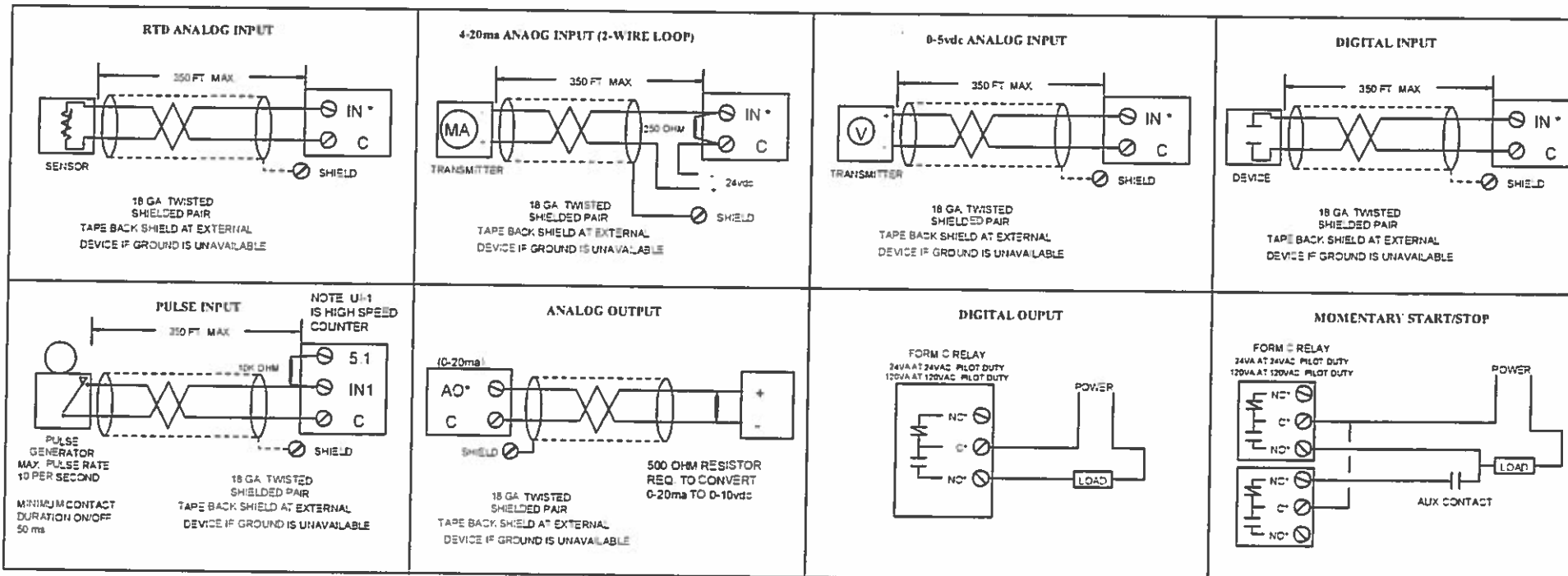
I/O Point Type (As Listed)

- AI: Analog Input
- AO: Analog Output
- DI: Contact or Digital Input
- DO: Digital Output

CONTROL DRAWING LEGEND

- REFERENCE WIRING DIAGRAM (NEXT PAGE) FOR CONTINUATION
- I/O DEVICE CABLE TO MICROZONE
- PNEUMATIC TUBING NUMBER TO PANEL
- PNEUMATIC TUBING TO PANEL
- 20# MAIN AIR TO PNEUMATIC CONTROL DEVICES

MICROZONE II WIRING SPECIFICATION & DETAILS



Abbreviations:

- HWS :Hot Water Supply
- HWR :Hot Water Return
- CHWS :Chilled Water Supply
- CHWR :Chilled Water Return
- F.W.E. :Furnished with Equipment
- N.O. :Normally Open
- N.C. :Normally Closed
- M.C. :Mechanical Contract/Contractor / Div. 15
- E.C. :Electrical Contract/Contractor / Div. 16

Schneider Electric
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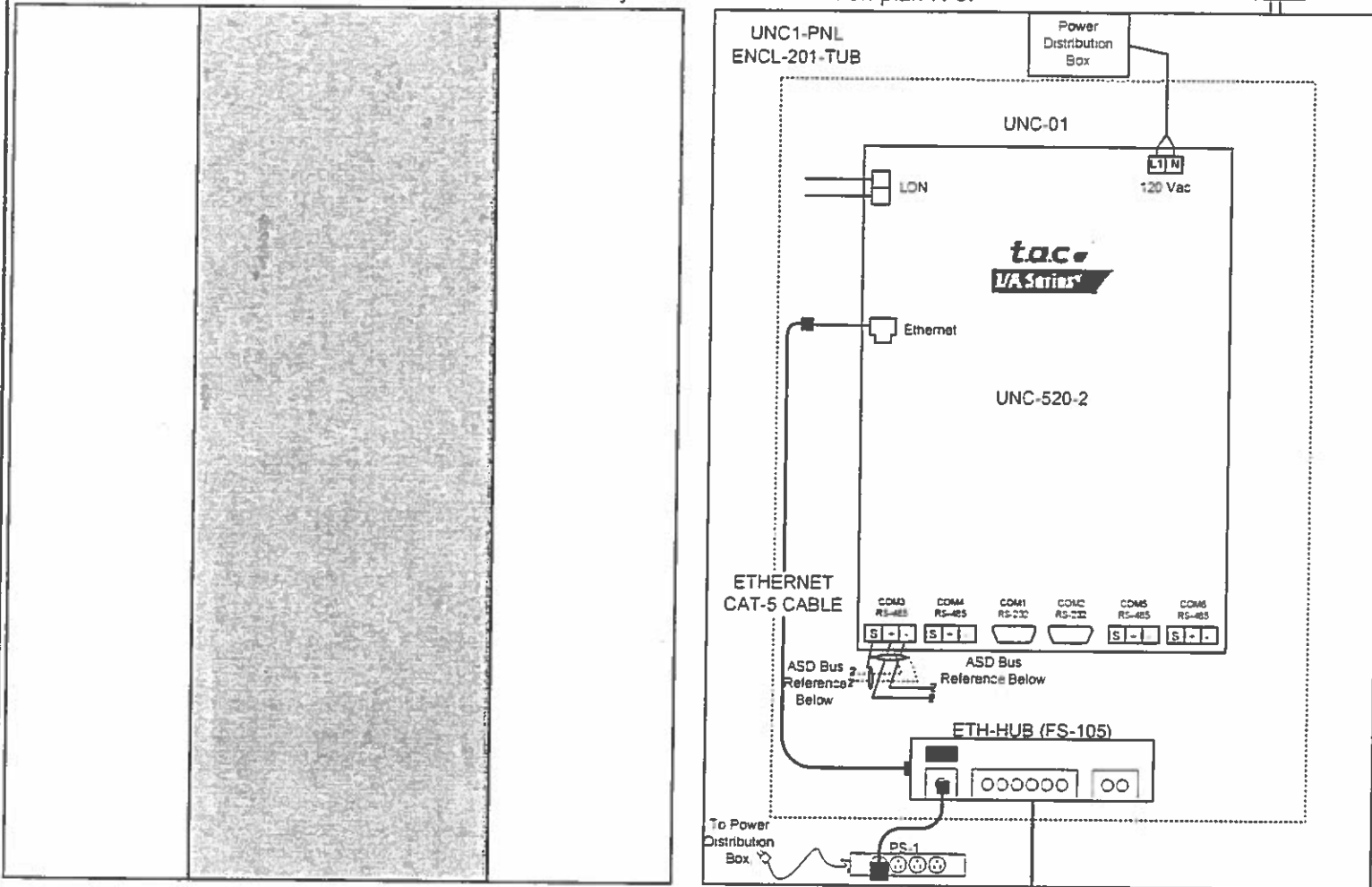
Revisions		Date:
#	Change As-Built	11/03/10
1		
2		
3		

Architect: DPS Lakeview Gym
 Engineer: Climate Control, Inc.
 Contractor: TLR Date: 04/27/2010
 Project Engr: Durham, NC
 Software Engr: General Wiring Details
 Project Mgr:

JOB NUMBER: RC 10C 1001
 FILE NAME: Network v1d
 SHEET NO.: 1 OF 4

UNC PANEL LAYOUT

ONE (1) ~ REQUIRED
18" W x 28" H x 7" D
Locate in Security Room where shown on plan H-3.



UNC1: ENCL-DOOR-PLA

↓ 1/2" EMT Conduit to ethernet LAN connection
(Coordinate Location w/ Building Owner)

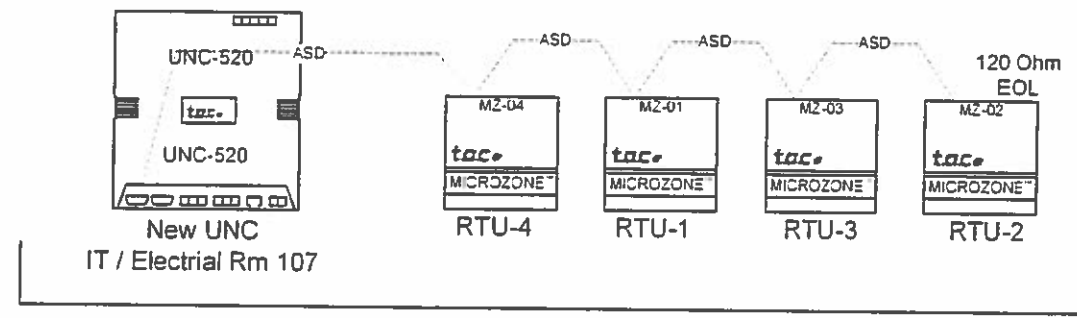
UNC / Network Bill of Material

Device	Qty	Part Number	Description	Manufacturer
HUB	1	FS-105	4-Port 10/100 MB Ethernet Hub	NETGEAR
LA302RUL	1	LA302RUL	Surge Protector	Delta Lightning Arrestors
PS-1	1	PS-100	4 Plug Outlet Strp w/ 3' Cord	Radio Shack
UNC-01	1	UNC-520-2	NETWORK CONTROLLER 10/100 MBIT	TAC (INVEN-AUT)
UNC-01_1	1	IA-ENT-N	SW FOR ADDITIONL UNC'S	TAC (INVEN-AUT)
UNC1-PNL	1	ENCL-201-TUB	DMS GCM ENCLOSURE W/ 120/24 X	TAC (INVEN-AUT)
UNC1-PNL_1	1	ENCL-DOOR-PLA	ENCLOSURE DOOR (PLAIN) FOR USE	TAC (INVEN-AUT)

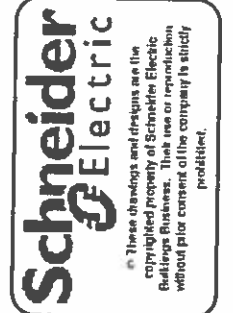
Device	Qty	Part Number	Description	Manufacturer
IA-DRV-ASD	1	IA-DRV-ASD	DRIVER, ASD-PER UNC, INCLUDES	TAC AUTOMATION

NOTE
NEW JACE PROVIDED FOR NEW EQUIPMENT.
EXISTING EQUIPMENT TO REMAIN ON EXISTING GCM.

NEW JACE BUS ARCHITECTURE



Gymnasium Addition



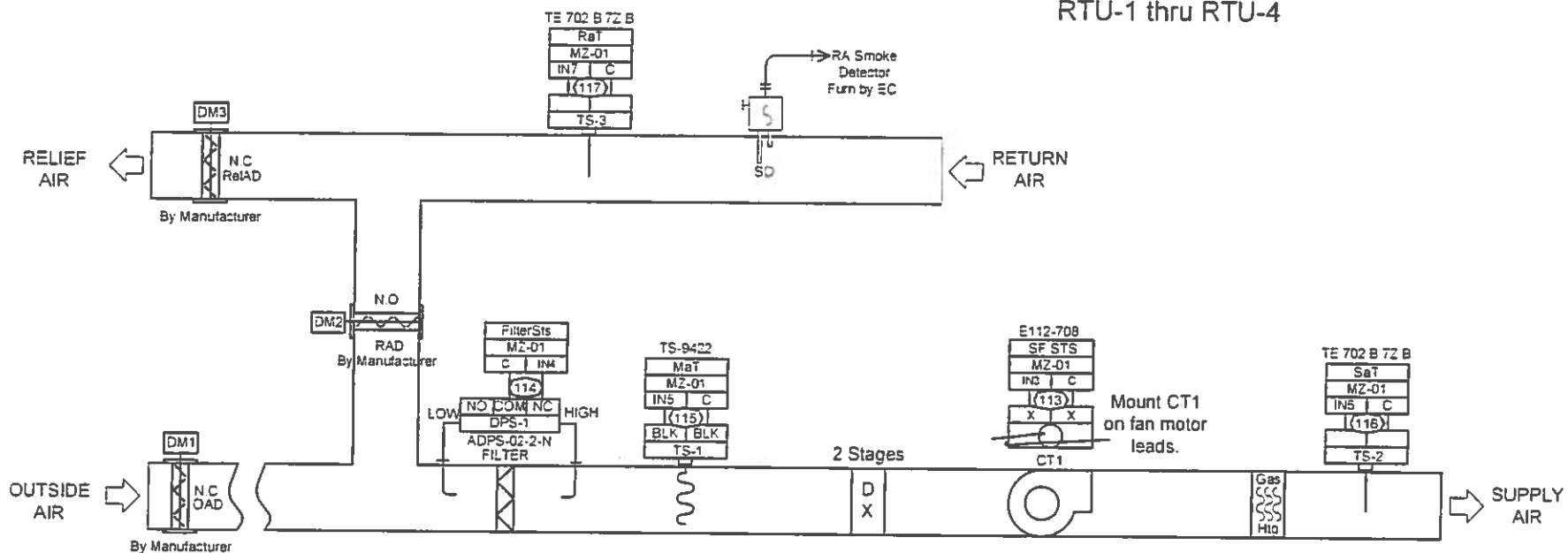
Revisions		Date:
#	Change	11/03/10
1	As-Built	

Architect: Climate Control, Inc.
Engineer: TLR Date: 04/27/2010
Contractor: Climate Control, Inc.
Project Engr: TLR Date: 04/27/2010
Software Engr:
Project Mgr:

DPS Lakeview Gym
Durham, NC
UNC Panel Detail

JOB NUMBER: RC10C1001
FILE NAME: Network.vsu
SHEET NO.: 2 OF 4

ROOF TOP UNIT CONTROL LAYOUT
FOUR (4) ~ REQUIRED
RTU-1 thru RTU-4



RTU Bill of Materials

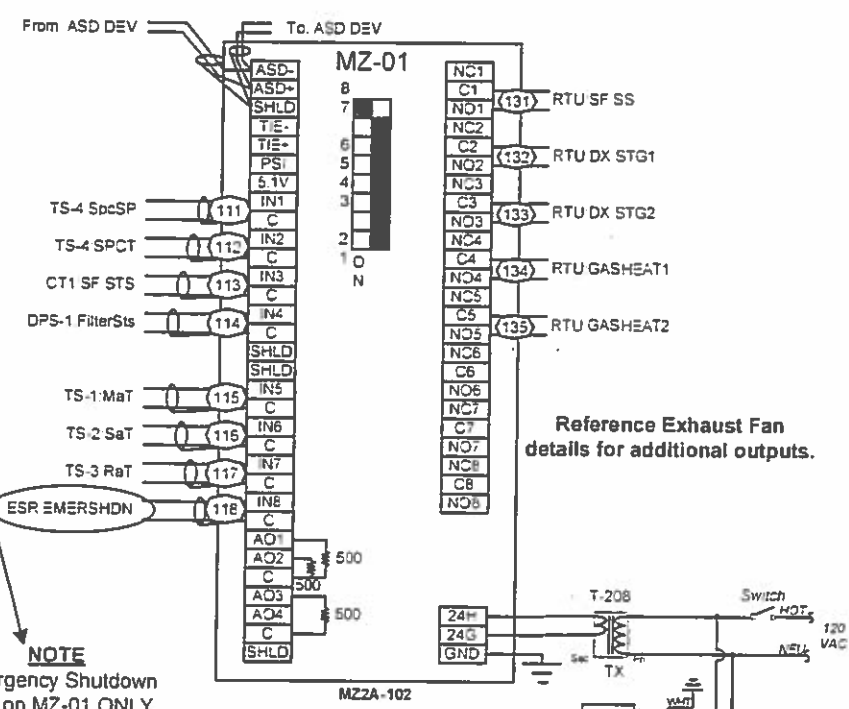
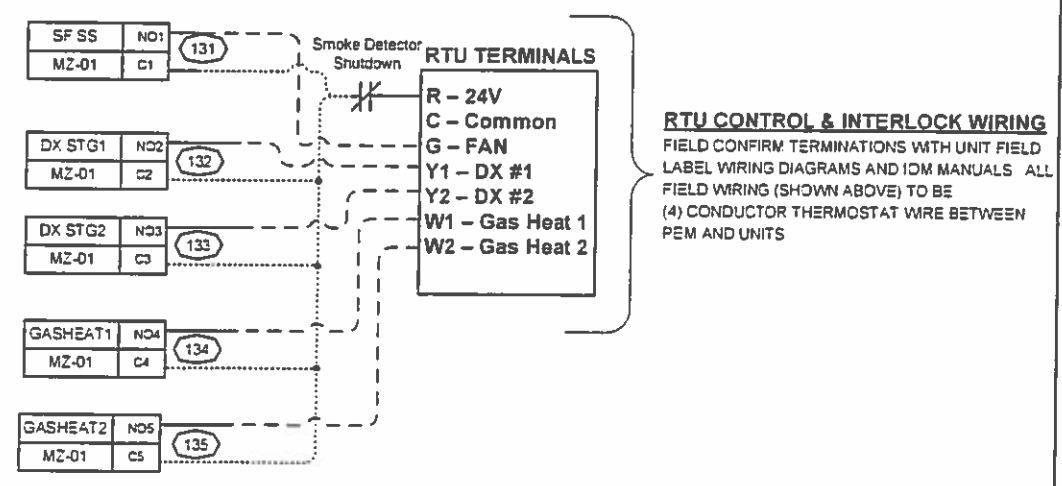
Roof Top Unit Device	Qty	Par. Number	Description	Manufacturer
CT1	4	E112-708	ADJ SETPT, TRIP LED, POWER LED	Vens Industries
DPS-1	4	ADPS-02-2-N	Differential Pressure Switch	Dwyer
DPS-1_1	8	AP-302	VELOCITY PROBE / STATIC PRESS	TAC (INVEN-COM)
LA302RUL	4	LA302RUL	Surge Protector	Delta Lightning Arrestors
MZ-01	4	MZ2A-102	MICROZONE II CTRLR (ASD) CTRLR	TAC (INVEN-AUT)
MZ End	4	ENCL-MZ800-WAL	ENCLOSURE FOR MZ 2 & MNL-800-W	TAC (INVEN-COM)
Switch	4	774002	On/Off Toggle Switch	Ideal
Switch_1	8	MCG57	Reducing Washers	McGill
TS-2_3	8	TE 702 B 7Z B	MAMAC Type 7Z sensor in a galv	Mamac Systems
TS-1	4	TS-9422	22" AVG SENSOR 1 K OHM BAL CO	TAC (INVEN-COM)
TS-4	4	TSMN-90250-850	10K THRMSTR 11K SHNT PRGM JACK	TAC (INVEN-COM)
TS Guard	2	AT-1105	TSTAT GUARD, PLASTIC FOR SINGL	TAC (INVEN-COM)
TX	4	T-208	TRANSFORMER 96 VA 120P-24VS U	Core Components
WireGrd	2	AT-1103	TSTAT GUARD, WIRE FOR SINGLE S	TAC (INVEN-COM)

Schneider Electric

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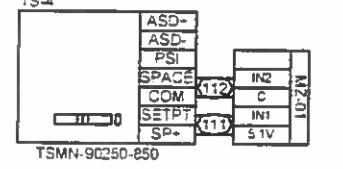
Revisions	Date
1	11/03/10
2	
3	
4	
5	

Roof Top Unit Wiring Detail
Four (4) ~ Required
RTU-1 thru RTU-4



Unit Name	BOM Tag	Total CFM	Min OA CFM	SF HP	Unit Voltage	Unit Location
RTU-1	MZ-01	6000	525	7.5	208V - 3 Ph	Gym 101
RTU-2	MZ-01	6000	525	7.5	208V - 3 Ph	Gym 101
RTU-3	MZ-01	2000	500	1	208V - 3 Ph	Office 102
RTU-4	MZ-01	1500	150	1	208V - 3 Ph	Classroom 105

Space Temperature Sensor Detail



Note
 Plastic cover required for sensors in office & classroom.
 Wire guards required for sensors located in the gym.

Roof Top Units

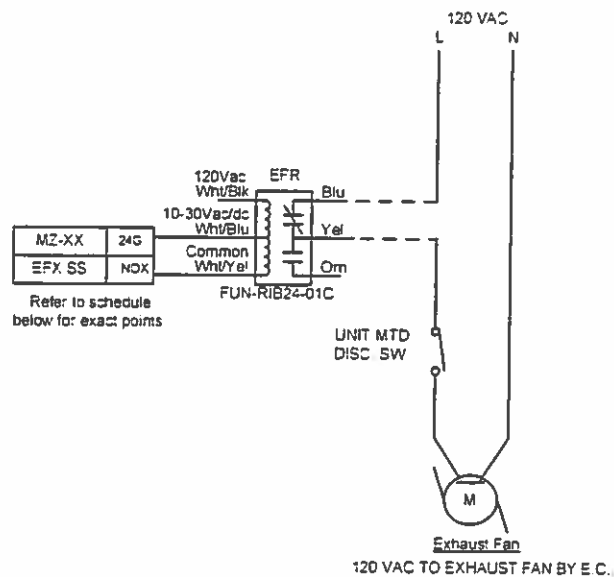
- The BAS shall enable the Rooftop Units in accordance with the building occupancy schedule.
- Fan shall operate when unit is scheduled as Occupied.
- All units shall have a wall mounted space temperature sensor.
- On fall in room temperature, the fan will run and the gas heat will be staged. On a rise in room temperature, the fan will run and the compressor(s) will be staged to maintain set point. The fan status will be monitored by a current switch.
- On a loss of fan status, cooling and heating will be disabled.

Architect: DPS Lakeview Gym
 Engineer: Climate Control, Inc.
 Contractor: Durham, NC
 Project Engr: TLR Date: 04/27/2010
 Software Engr:
 Project Mgr: Roof Top Unit

JOB NUMBER: RC10C 1001
 FILE NAME: Gym RTU vsd
 SHEET NO.: 3 OF 4

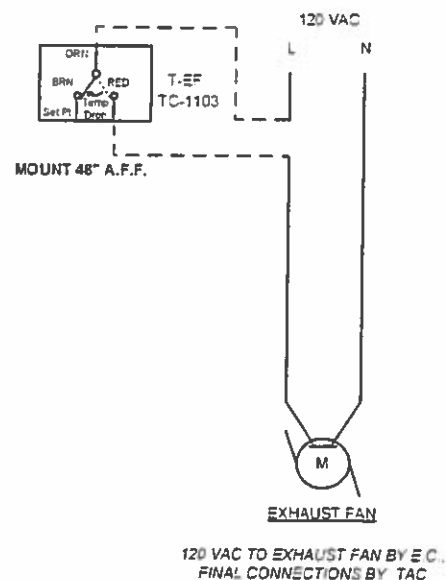
DDC Controlled Exhaust Fan Wiring

Two (2) - Required
EF-1 & EF-2



Thermostat Controlled Exhaust Fan Wiring

One (1) - Required
EF-3



Exhaust Fan Sequence

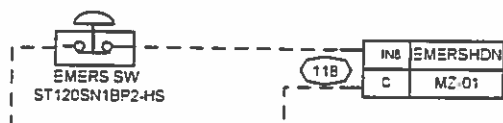
Exhaust fans EF-1 & EF-2 shall Start/Stop by the BAS where so indicated on the fan schedule and control diagrams. The fans in a particular zone shall be on the same time-of-day schedule as the roof top units zone.

Exhaust fans EF-3 shall be controlled by a cooling thermostat. Thermostat located where shown on plan M2.1 in IT/Elec Rm 107.

EXHAUST FAN SCHEDULE						
EF Number	HP	Voltage	Fan CFM	Service	Control	
F-1	1/6	115V / 1 Ph	675	Restroom 104 / 106	MZ-01 NO8 (RTU-1)	
F-2	46W	115V / 1 Ph	75	Custodian 105	MZ-02 NO8 (RTU-2)	
F-3	83W	115V / 1 Ph	230	IT / Electrical 107	Cooling Thermostat	

Emergency Stop Switch Details

FOR EMERGENCY USE ONLY
ROOF TOP UNIT STOP SWITCH.

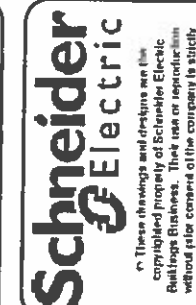


Emergency Shutdown Input @ MZ-01 (RTU-1)
Locate switch in office area.

Bill of Materials

Emer Shut Down Device	Qty	Part Number	Description	Manufacturer
EMERS SW	1	ST120SN1BP2-HS	Red Break Glass Maintained Pus	KELE
EMERS SW_2	1	PI1LCHCOV5	Clear Hinged Cover for Break G	KELE
EMERS SW_1	1	PI1NCCB	NC Stackable Contact Block	KELE

Exhaust Fans Device	Qty	Part Number	Description	Manufacturer
EFR	2	FUN-RIB24-01C	ENCLOSED RELAY 10AMP SPDT 24VA	Functional Devices
T-EF	1	TC-1103	ROOM STAT SPDT, 75-105F(INCL 1	TAC (INVEN-COM)



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Revisions		Date:
#	Change As-Built	11/03/10
1		
2		
3		





Architect: Climate Control, Inc.
Engineer: TLR Date: 04/27/2010
Contractor: TLR Date: 04/27/2010
Project Engr: TLR Date: 04/27/2010
Software Engr:
Project Mgr:

DPS Lakeview Gym
Durham, NC
Exhaust Fans / Emergency Stop



JOB NUMBER: RC10C1001
FILE NAME: Mfile_v8.dwg
SHEET NO.: 4 OF 4

LAKEVIEW SCHOOL RENOVATIONS DURHAM NORTH CAROLINA

T-01-1	TITLE PAGE / TABLE OF CONTENTS
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T-02-2	MASTER BILL OF MATERIALS
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T-07-1	ASD WIRING LAYOUT
T-07-2	GCM-86120 PANEL LAYOUT
FD-01-1	MZ-1/RTU -1 & 2 DETAILS
FD-01-2	MZ-2/RTU -3 & 4 DETAILS
FD-01-3	MZ-3/RTU -5 & 6 DETAILS
FD-01-4	MZ-4/RTU -7 & 8 DETAILS
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FD-02-2	TEMPERATURE SENSOR DETAILS
FD-02-3	UNIT HEATER & EXHAUST FAN DETAILS
PD-01-1	PANEL WIRING DETAILS
PD-02-1	PANEL 01 LAYOUT
PD-02-2	PANEL 02 LAYOUT
PD-02-3	GCM & PANEL LAYOUT

	—	PANEL CLASS II WIRING
	—	PANEL CLASS I WIRING
	—	FIELD CLASS I WIRING
	—	FIELD CLASS II WIRING

Drawing Title TITLE / TABLE OF CONTENT		REFERENCE DRAWING	NO.	REVISION-LOCATION	NET #	DATE	BY
Project Title LAKEVIEW SCHOOL		Sales Engineer J.G.	Project Engineer K.V.	DRAWN BY K.V.	DATE 05/03/2000	Contract Number 31003-00051	
		Branch Information 5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		Drawing Number T-01-1			

 1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.



PIPING

—— LPS ——	LOW PRESSURE STEAM <15 PSI
—— LPC ——	LOW PRESSURE COND. RETURN
—— HWS ——	HOT WATER SUPPLY
—— HWR ——	HOT WATER RETURN
—— CHWS ——	CHILLED WATER SUPPLY
—— CHWR ——	CHILLED WATER RETURN
—— CWS ——	CONDENSER WATER SUPPLY
—— CWR ——	CONDENSER WATER RETURN
—— MU ——	MAKE UP WATER
—— DTS ——	DUAL TEMP SUPPLY
—— DTR ——	DUAL TEMP RETURN
—— DHWS ——	DOMESTIC HOT WATER SUPPLY
—— D ——	DRAIN
—— HPWS ——	HEAT PUMP WATER SUPPLY
—— HPWR ——	HEAT PUMP WATER RETURN
—— // ——	PNEUMATIC AIRLINE
—— (P) ——	PUMP

CONTROL COMPONENTS

(L)	COMMUNICATIONS WIRE LIGHTNING SURGE PROTECTOR
(R)	REPEATER
(X)	COMMUNICATIONS JACK
GCM #	GLOBAL CONTROL MODULE
GCS #	GLOBAL CONTROL SATELLITE
LCM #	LOCAL CONTROL MODULE

CONTROL COMPONENTS (CONT.)

# P	PACKAGED EQUIPMENT MODULE (PEM-#) # = CONTROLLER #
# M	MICROZONE II (MZII-#) # = CONTROLLER #
# F	MICROFLO II (MFII-#) # = CONTROLLER #
SD	DUCT MOUNTED SMOKE DETECTOR
MPE	PROPORTIONAL ELECTRIC ACTUATOR
MFE	FLOATING ELECTRIC ACTUATOR
M2E	TWO POSITION ELECTRIC ACTUATOR
MPP	PNEUMATIC PROPORTIONAL ACTUATOR
M2P	PNEUMATIC TWO POSITION ACTUATOR
TS	IMMERSION TEMPERATURE SENSOR
TS	DUCT TEMPERATURE SENSOR
TS	OUTSIDE AIR TEMPERATURE SENSOR WITH SUNSHIELD
TS	STRAP ON SENSOR
#	AVERAGING TEMPERATURE SENSOR # = LENGTH OF SENSOR
(R)	THERMOSTAT REMOTE BULB
TS	THERMOSTAT IMMERSION

ELECTRICAL

---	LINE VOLTAGE FIELD WIRING
.....	LOW VOLTAGE FIELD WIRING
X XX	I/O NUMBER
#	CONTROLLER NUMBER
#	FUSE (# = AMPERAGE)
TRANSFORMER	TRANSFORMER
RESISTOR	RESISTOR
LIGHT	LIGHT
CLOSE ON TEMPERATURE FALL	CLOSE ON TEMPERATURE FALL
CLOSE ON TEMPERATURE RISE	CLOSE ON TEMPERATURE RISE
CLOSE ON DECREASE OF FLOW	CLOSE ON DECREASE OF FLOW
CLOSE ON RISE OF FLOW	CLOSE ON RISE OF FLOW
FLOAT, CLOSE ON LEVEL DECREASE	FLOAT, CLOSE ON LEVEL DECREASE
FLOAT, CLOSE ON LEVEL RISE	FLOAT, CLOSE ON LEVEL RISE
CLOSE ON PRESSURE RISE	CLOSE ON PRESSURE RISE
CLOSE ON PRESSURE DROP	CLOSE ON PRESSURE DROP

ABBREVIATIONS

AFS	AIR FLOW SWITCH
CDAT	COLD DECK SUPPLY AIR TEMP
CS	CURRENT SENSOR
DP-1	DIFFERENTIAL PRESSURE SWITCH
EAD	EXHAUST AIR DAMPER
FBD FLT	FACE AND BYPASS DAMPER FILTER DIFFERENTIAL PRESSURE
FSW	SWITCH WATER FLOW SWITCH
HDAT	HOT DECK SUPPLY AIR TEMP
IGV	INLET GUIDE VANES
LL-1	LOW LIMIT THERMOSTAT
MAD	MIXED AIR DAMPER
MAT	MIXED AIR TEMPERATURE
OAD	OUTSIDE AIR DAMPER
OAT	OUTSIDE AIR TEMPERATURE
PAT	PREHEAT AIR TEMPERATURE
RAD	RETURN AIR DAMPER
RAT	RETURN AIR TEMPERATURE
SAT	SUPPLY AIR TEMPERATURE
SD	SMOKE DETECTOR

GENERAL SYMBOLS

#	
#	

LEDGEND

△	PANEL CLASS II WIRING
—	PANEL CLASS I WIRING
---	FIELD CLASS I WIRING
.....	FIELD CLASS II WIRING

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
LEDGEND		REFERENCE DRAWING	DRAWN		DATE		BY	
		Sales Engineer J.G.	Project Engineer K.V.	05/03/2000				
Project Title		Branch Information		Contract Number				
LAKEVIEW SCHOOL		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051				
		srs		Drawing Number		T-02-1		

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.



Sequence of Operation

Units shall be indexed to run by the BMS (Building Management System). Upon being indexed to run, The unit fan shall run continuously, the Outside air damper will open, if outside conditions are met for Economizer operation.

The cooling will be staged on if there is a rise in room temperature above the Setpoint established by the BMS. upon a fall in room temperature, cooling will be indexed off, the fan will continue to run.

Upon a further fall in room temperature below the heating Setpoint as set by the BMS, the gas fired heat will be indexed to run and will continue to run until the room temperature has risen to an acceptable level above the Setpoint as set by the BMS, whereupon the heat will be index off.

The Media Center unit will operate in the same manner. The addition of a space Humidity sensor in the Media Center will make it possible to monitor the % of Relative Humidity. If the Humidity rises to a level above the Setpoint as set by the BMS, the cooling, may at that point be indexed on to lower the amount of humidity in the space. The gas heat would be indexed on to maintain space temperature Setpoint.




— PANEL CLASS II WIRING

— PANEL CLASS I WIRING

- - FIELD CLASS I WIRING

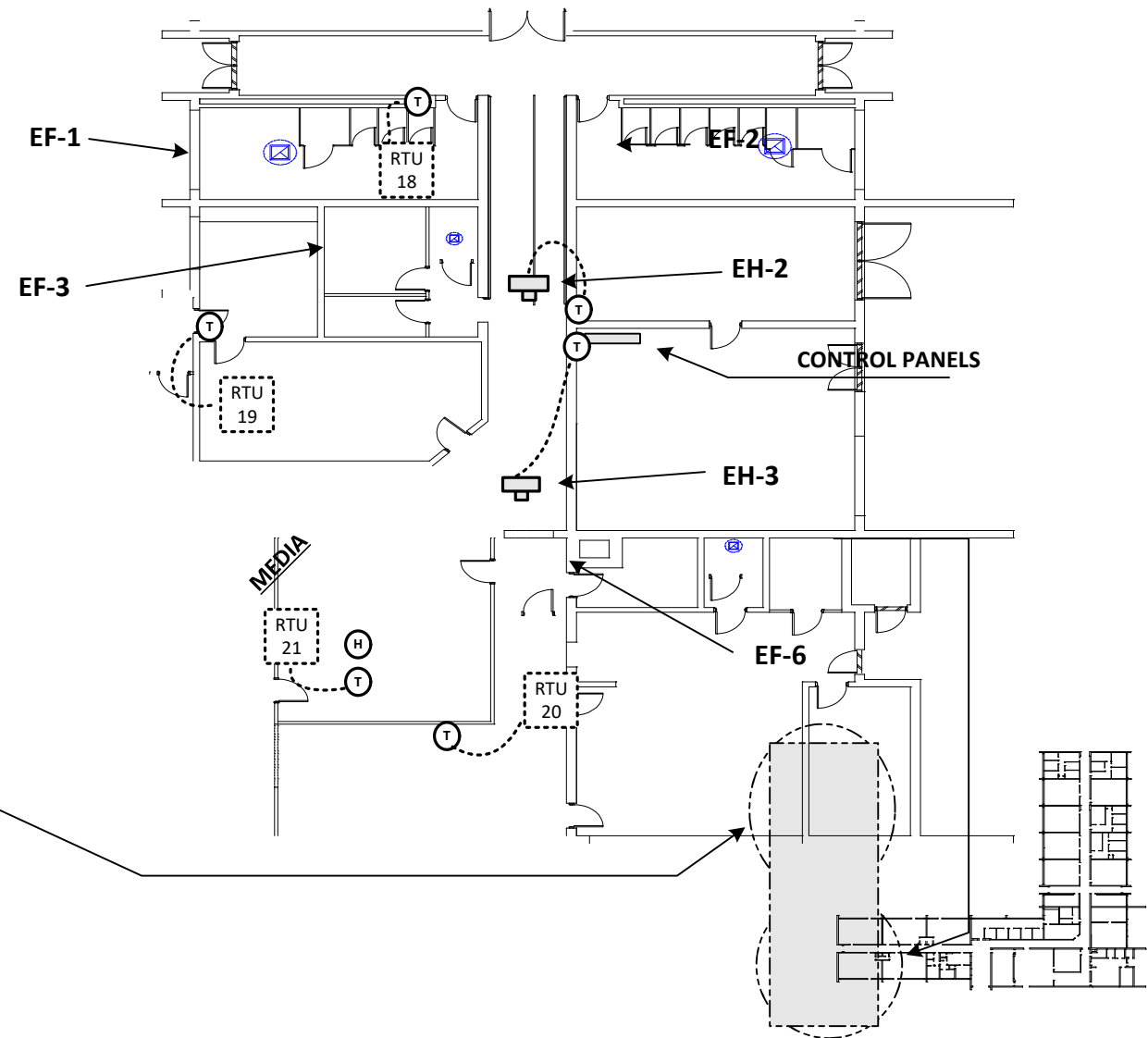
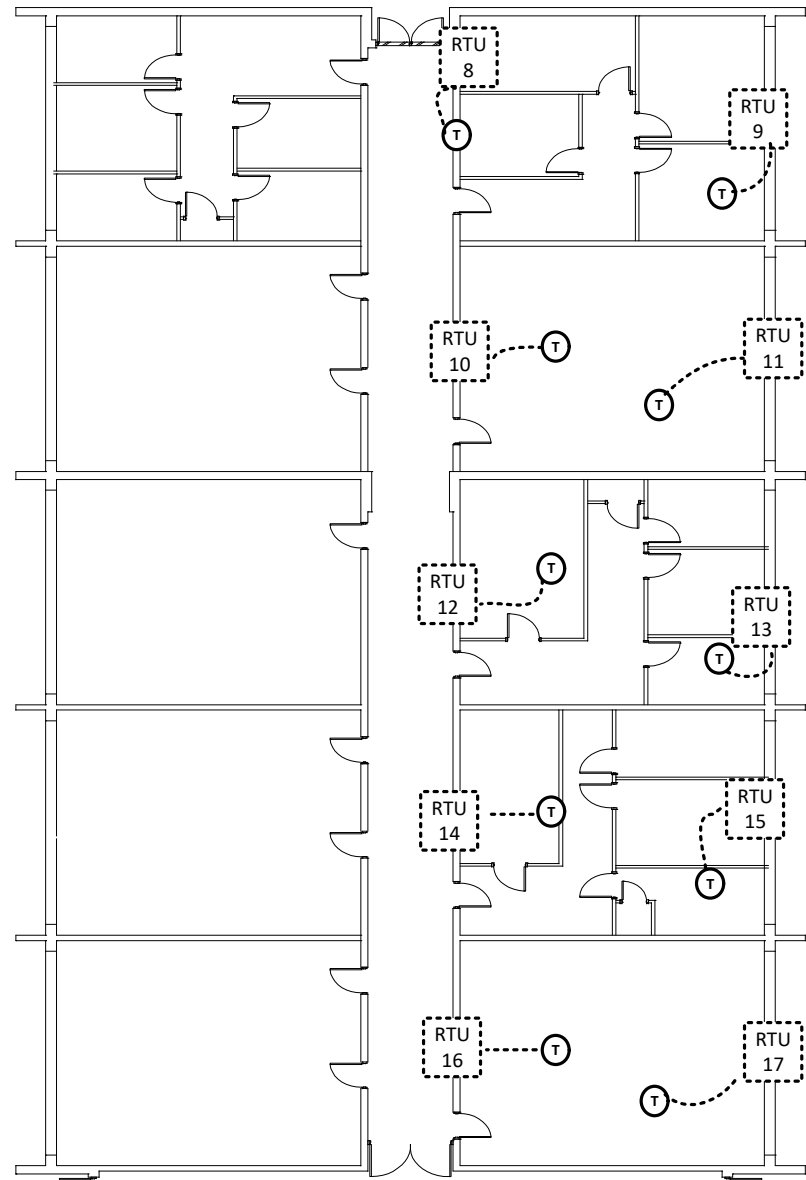
..... FIELD CLASS II WIRING





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REFERENCE DRAWING	NO.	REVISION-LOCATION		NET #	DATE	BY
Sales Engineer	Project Engineer	DRAWN				
J.G.	K.V.	BY	K.V.	DATE	05/03/2000	
Project Title		Branch Information		Contract Number		
LAKEVIEW SCHOOL		 5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		
				Drawing Number		
				T-04-1		





1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.



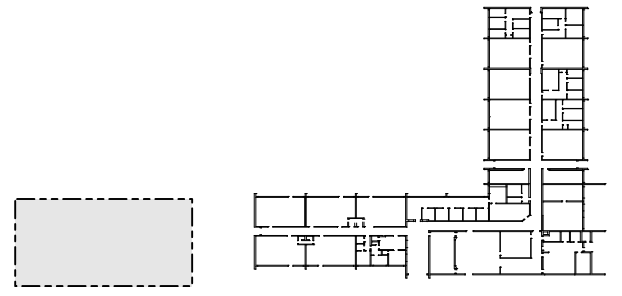
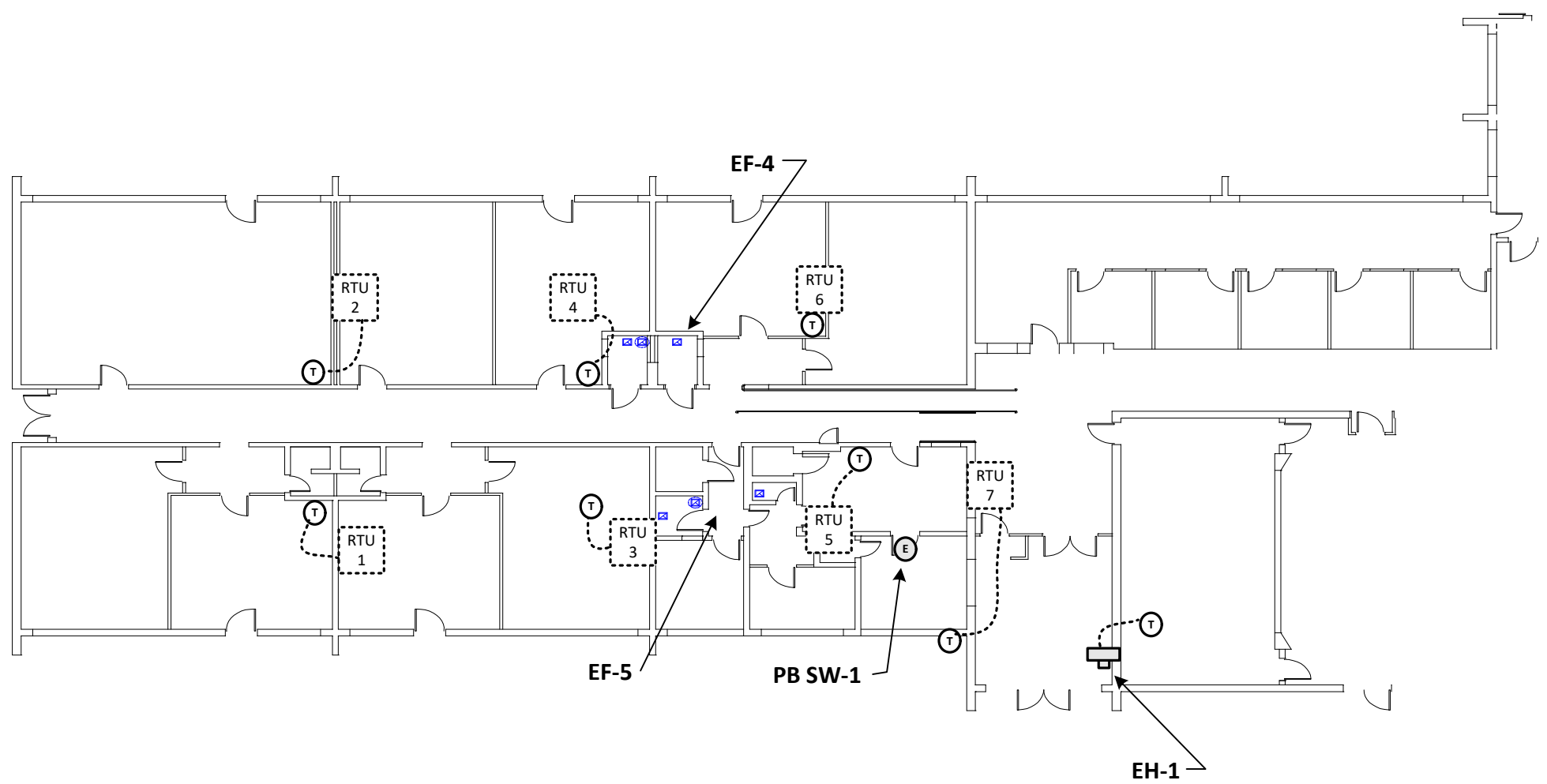






-  ——— PANEL CLASS II WIRING
-  ——— PANEL CLASS I WIRING
-  ——— FIELD CLASS I WIRING
-  FIELD CLASS II WIRING



-  1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
-  2. ASD BUS IN PURPLE JACKETED CABLE.


Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
ZONE MAP I		REFERENCE DRAWING	DRAWN					
		Sales Engineer J.G.	Project Engineer K.V.	BY	K.V.	DATE	05/03/2000	
Project Title		Branch Information		Contract Number				
LAKEVIEW SCHOOL		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		Drawing Number T-05-1		



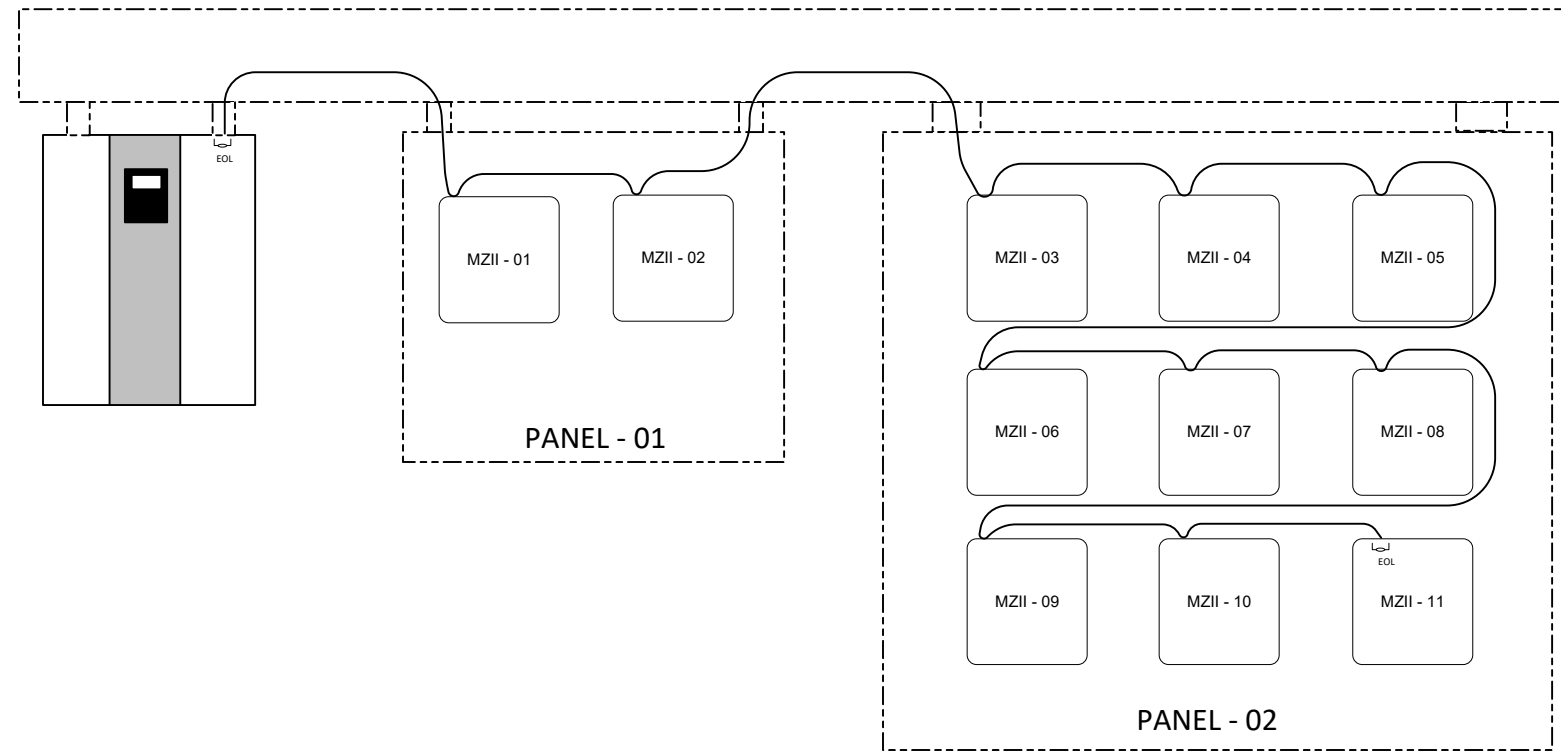


-  ——— PANEL CLASS II WIRING
-  ——— PANEL CLASS I WIRING
-  ——— FIELD CLASS I WIRING
-  FIELD CLASS II WIRING

-  1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
-  2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		NO.		REVISION-LOCATION		NET #		DATE		BY	
ZONE MAP II											
Project Title		Project Engineer		DRAWN		Branch Information		Contract Number			
LAKEVIEW SCHOOL		K.V.		BY K.V. DATE 05/03/2000		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		Drawing Number T-05-2	
											



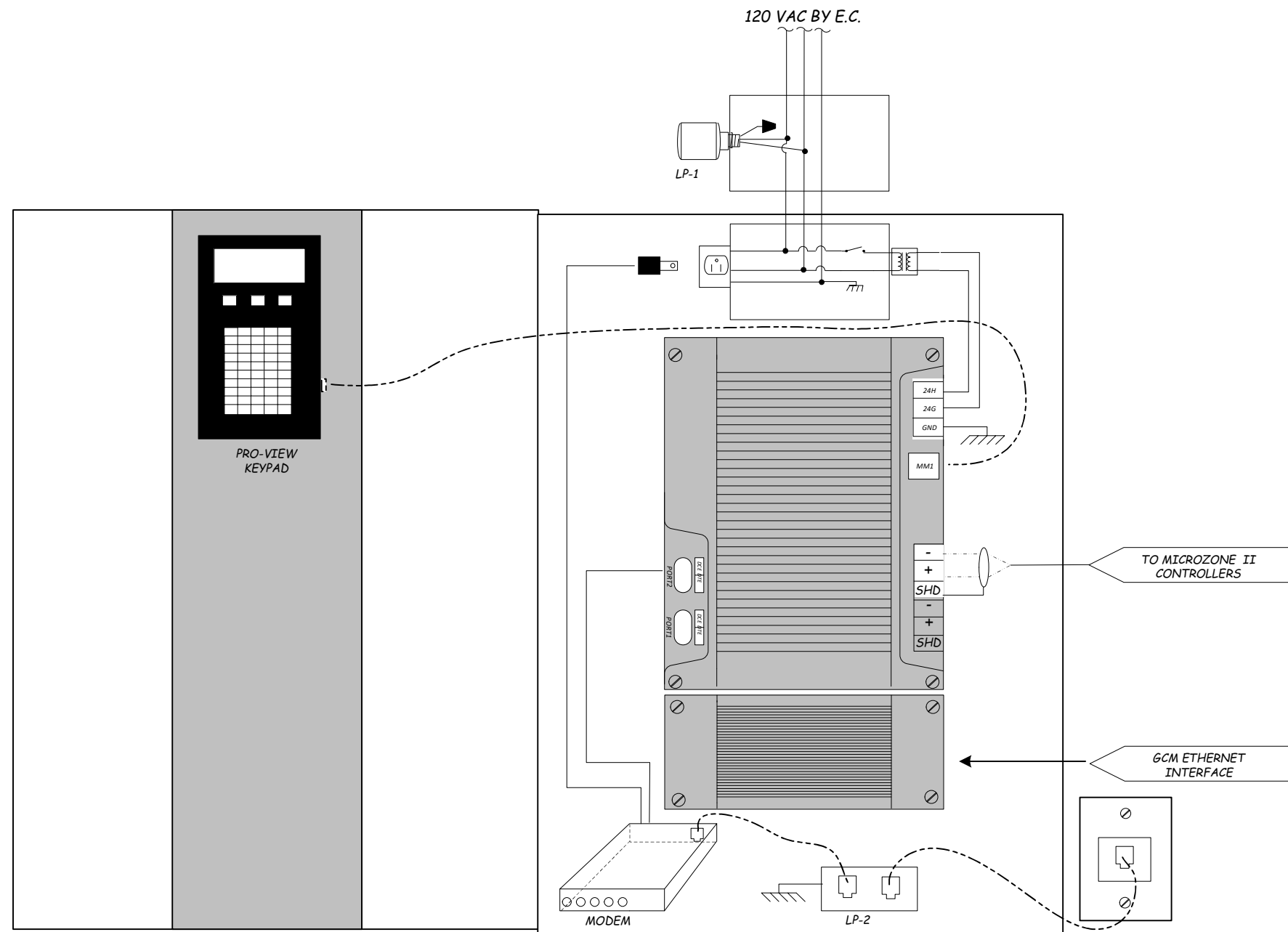


- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- - - FIELD CLASS I WIRING
- FIELD CLASS II WIRING

- △ 1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
- △ 2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		ASD LAYOUT		NO.		REVISION-LOCATION		NET #		DATE		BY	
Project Title		LAKEVIEW SCHOOL		Sales Engineer		Project Engineer		DRAWN		BY		DATE	
		J.G.		K.V.		BY		K.V.		DATE		05/03/2000	
				Branch Information		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		Contract Number		31003-00051		Drawing Number	
												T-07-1	



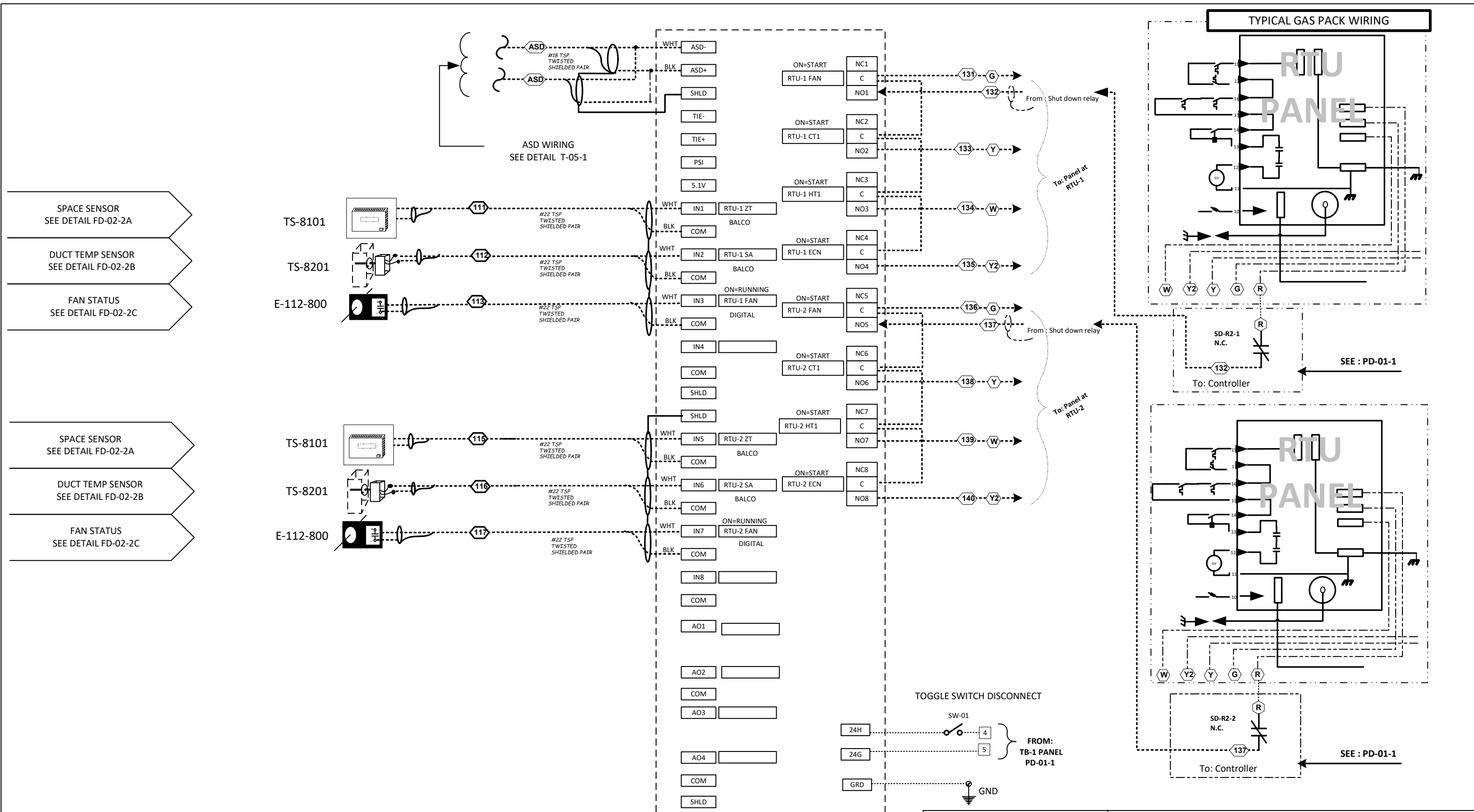


- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- - - FIELD CLASS I WIRING
- FIELD CLASS II WIRING

Drawing Title		NO.		REVISION-LOCATION		NET #		DATE		BY	
GCM MOUNTING DETAIL											
Project Title		Project Engineer		DRAWN		Branch Information		Contract Number			
LAKEVIEW SCHOOL		K.V.		J.G.		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051			
								Drawing Number		T-07-2	

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.



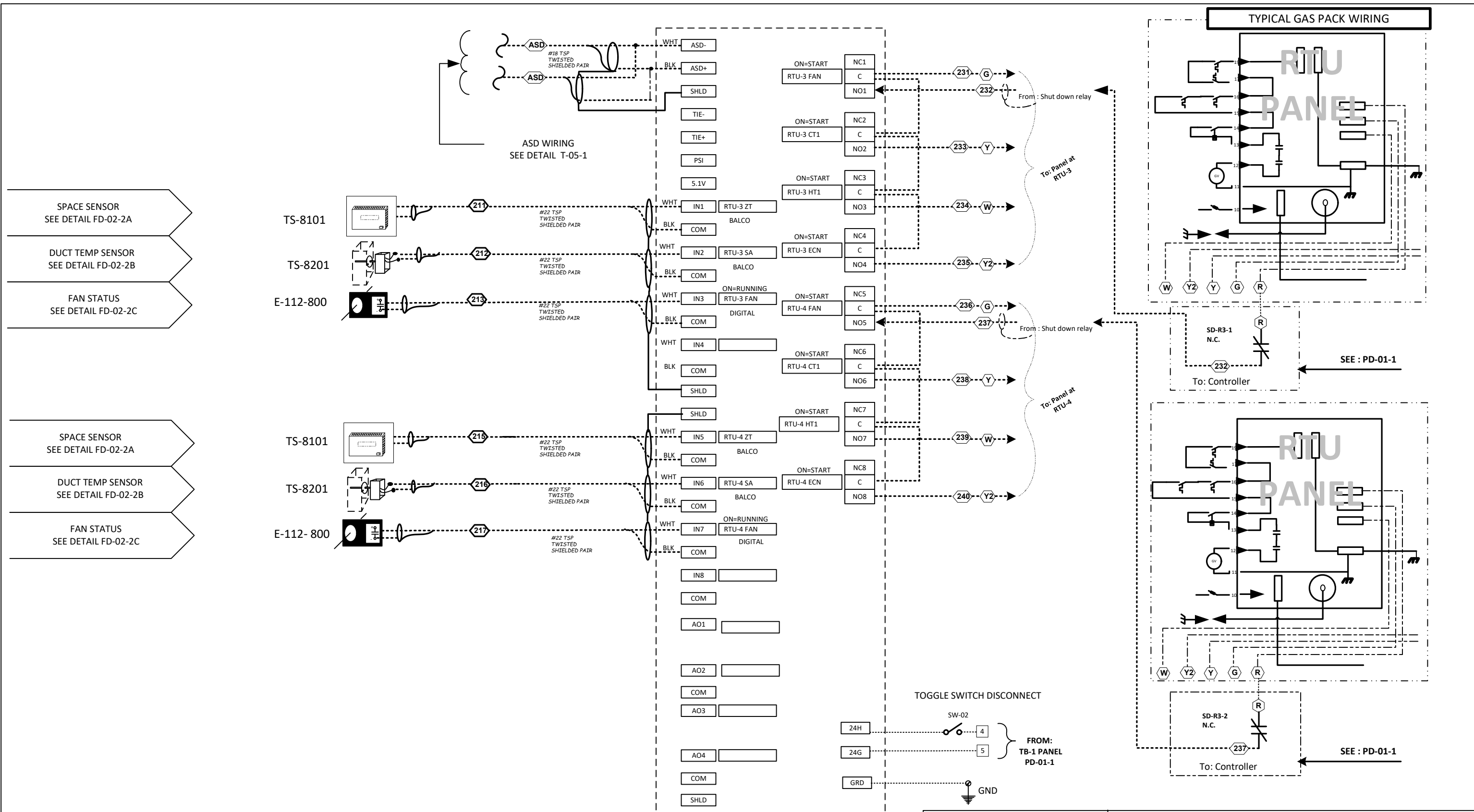


- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
MZ-01								
REFERENCE DRAWING	Project Engineer	DRAWN		DATE		Contract Number		
J.G.	K.V.	BY K.V.		DATE 05/03/2000		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		
Project Title						Branch Information		Contract Number
LAKEVIEW SCHOOL						SRS		31003-00051
								Drawing Number
								FD-01-1

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.





SPACE SENSOR
SEE DETAIL FD-02-2A

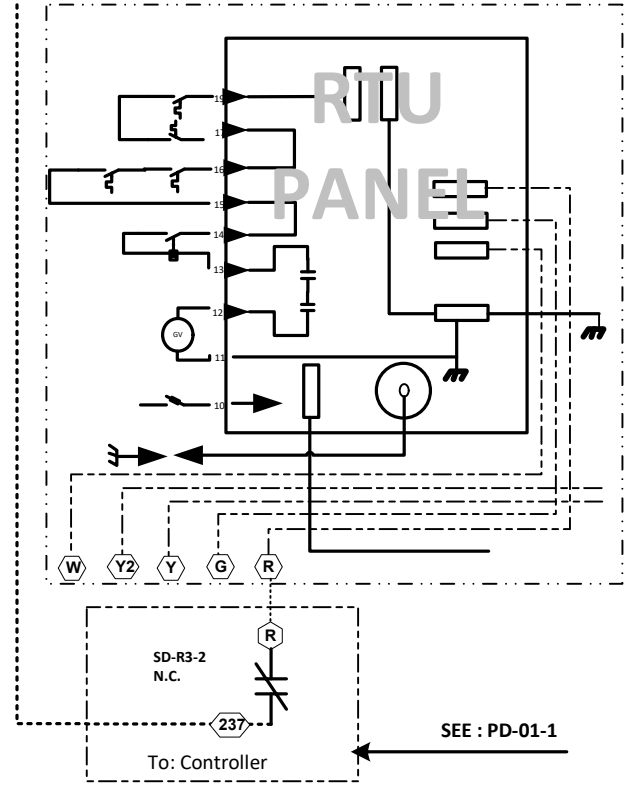
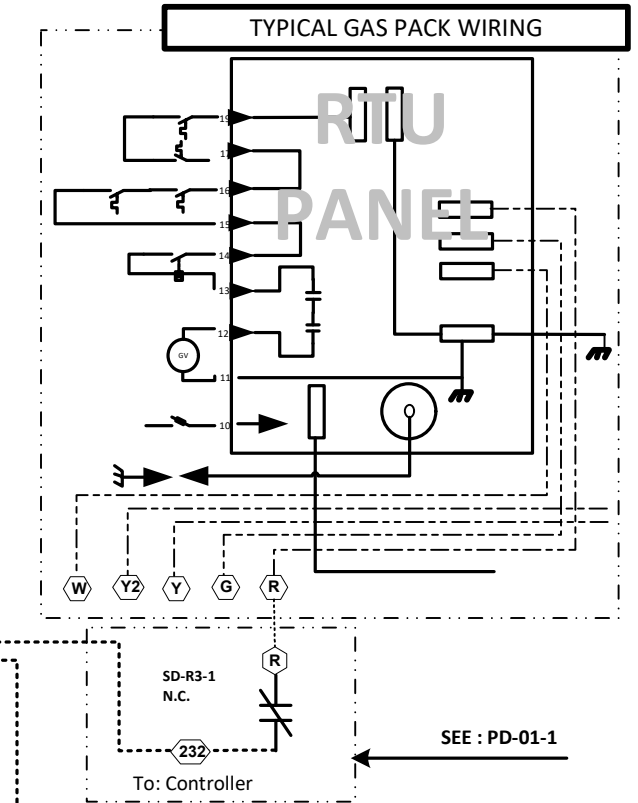
DUCT TEMP SENSOR
SEE DETAIL FD-02-2B

FAN STATUS
SEE DETAIL FD-02-2C

SPACE SENSOR
SEE DETAIL FD-02-2A

DUCT TEMP SENSOR
SEE DETAIL FD-02-2B

FAN STATUS
SEE DETAIL FD-02-2C

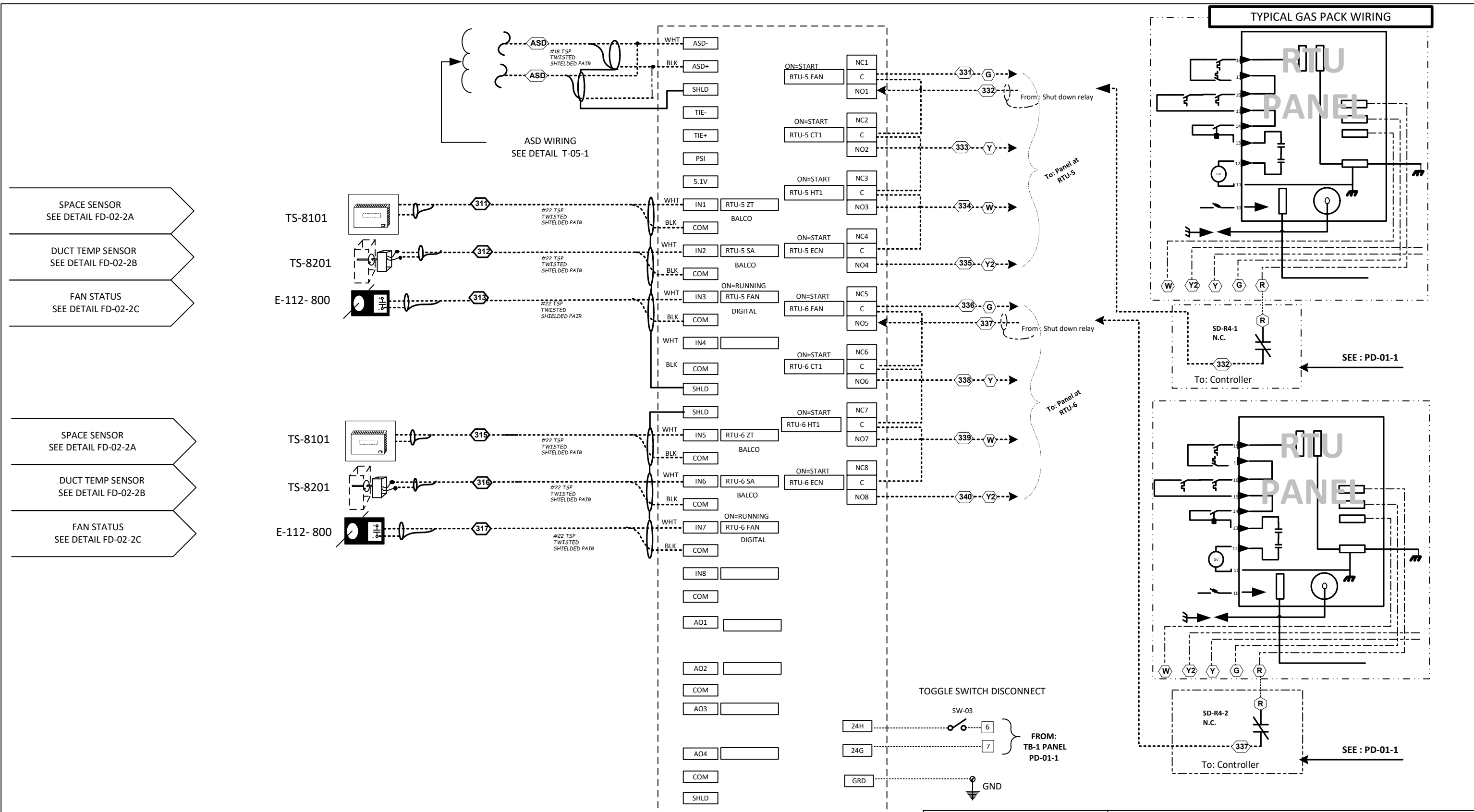


- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

Drawing Title		MZ-02		NO.	REVISION-LOCATION	NET #	DATE	BY
REFERENCE DRAWING	Sales Engineer	J.G.	Project Engineer	K.V.	BY	K.V.	DATE	05/03/2000
Project Title		LAKEVIEW SCHOOL		Branch Information		Contract Number		
				5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		
						Drawing Number		
						FD-01-2		

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.





SPACE SENSOR
SEE DETAIL FD-02-2A

DUCT TEMP SENSOR
SEE DETAIL FD-02-2B

FAN STATUS
SEE DETAIL FD-02-2C

SPACE SENSOR
SEE DETAIL FD-02-2A

DUCT TEMP SENSOR
SEE DETAIL FD-02-2B

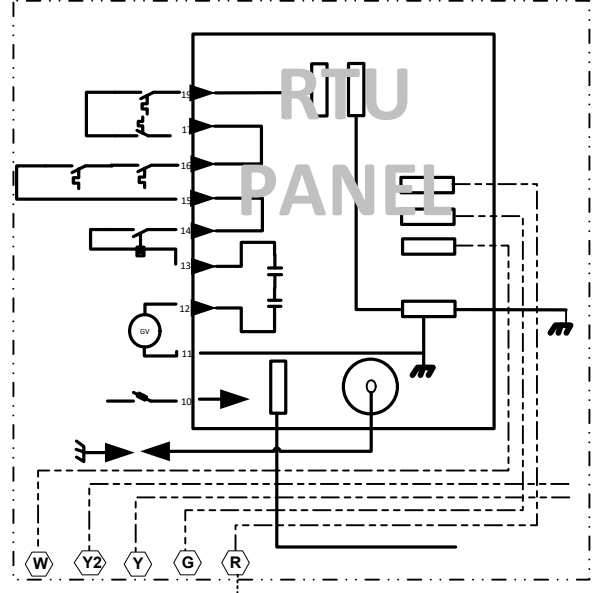
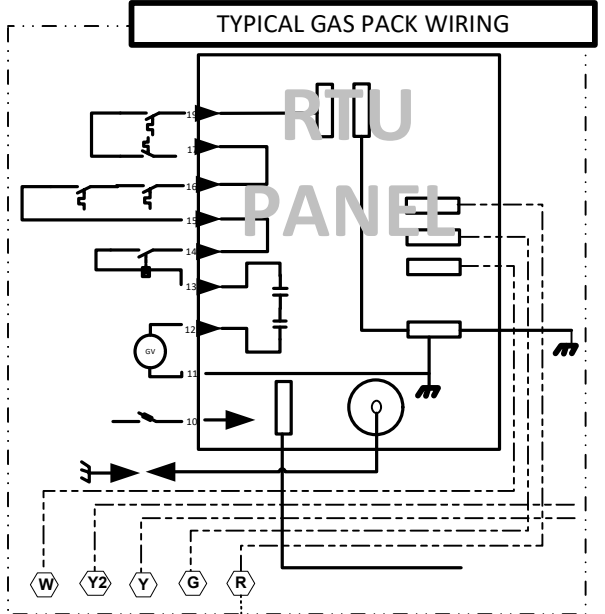
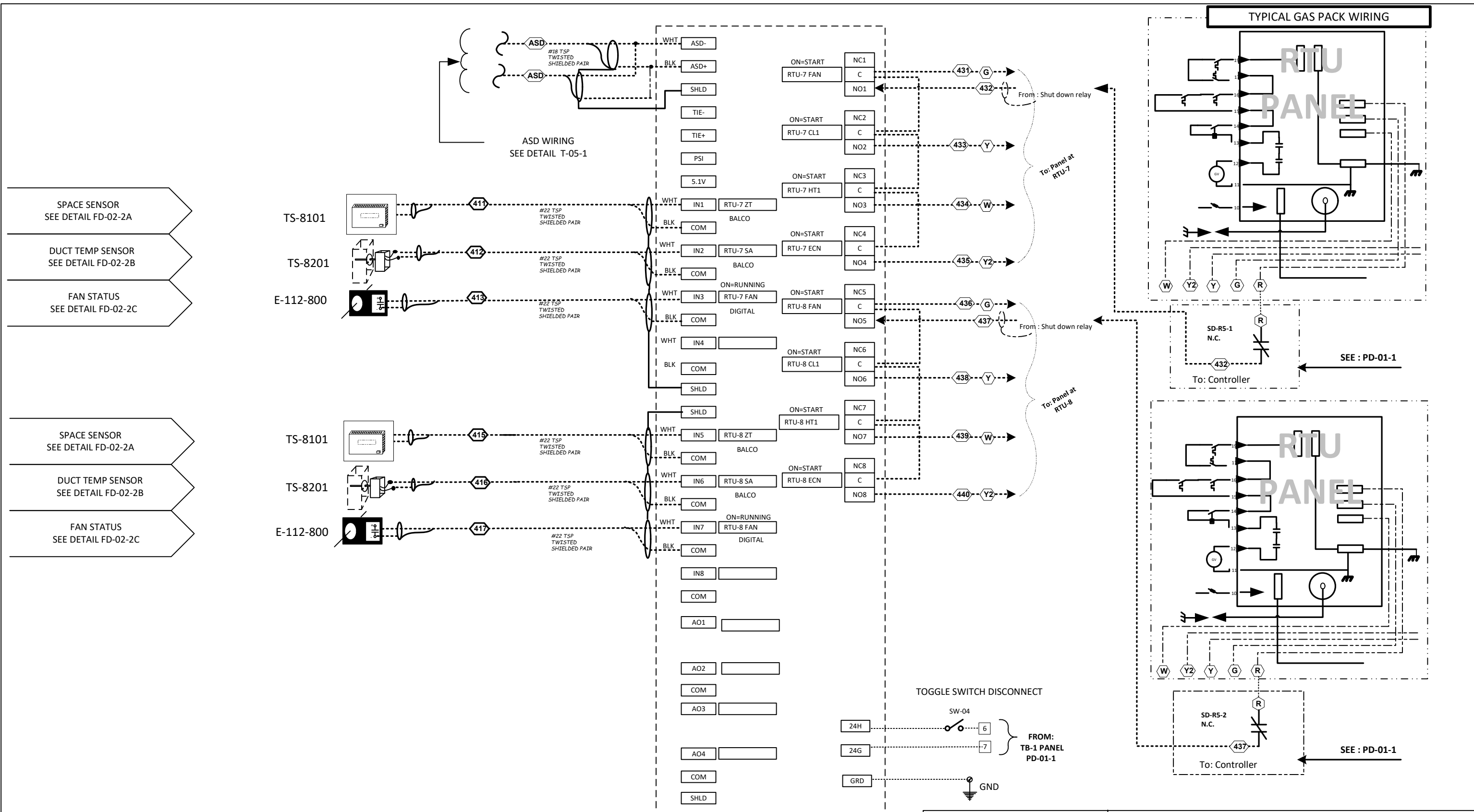
FAN STATUS
SEE DETAIL FD-02-2C

- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

Drawing Title		MZ-03		NO.	REVISION-LOCATION	NET #	DATE	BY
REFERENCE DRAWING	Project Engineer	NO.	DATE	BY	K.V.	DATE	05/03/2000	
Project Title		LAKEVIEW SCHOOL		Branch Information		Contract Number		
				5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		
						Drawing Number		FD-01-3

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.



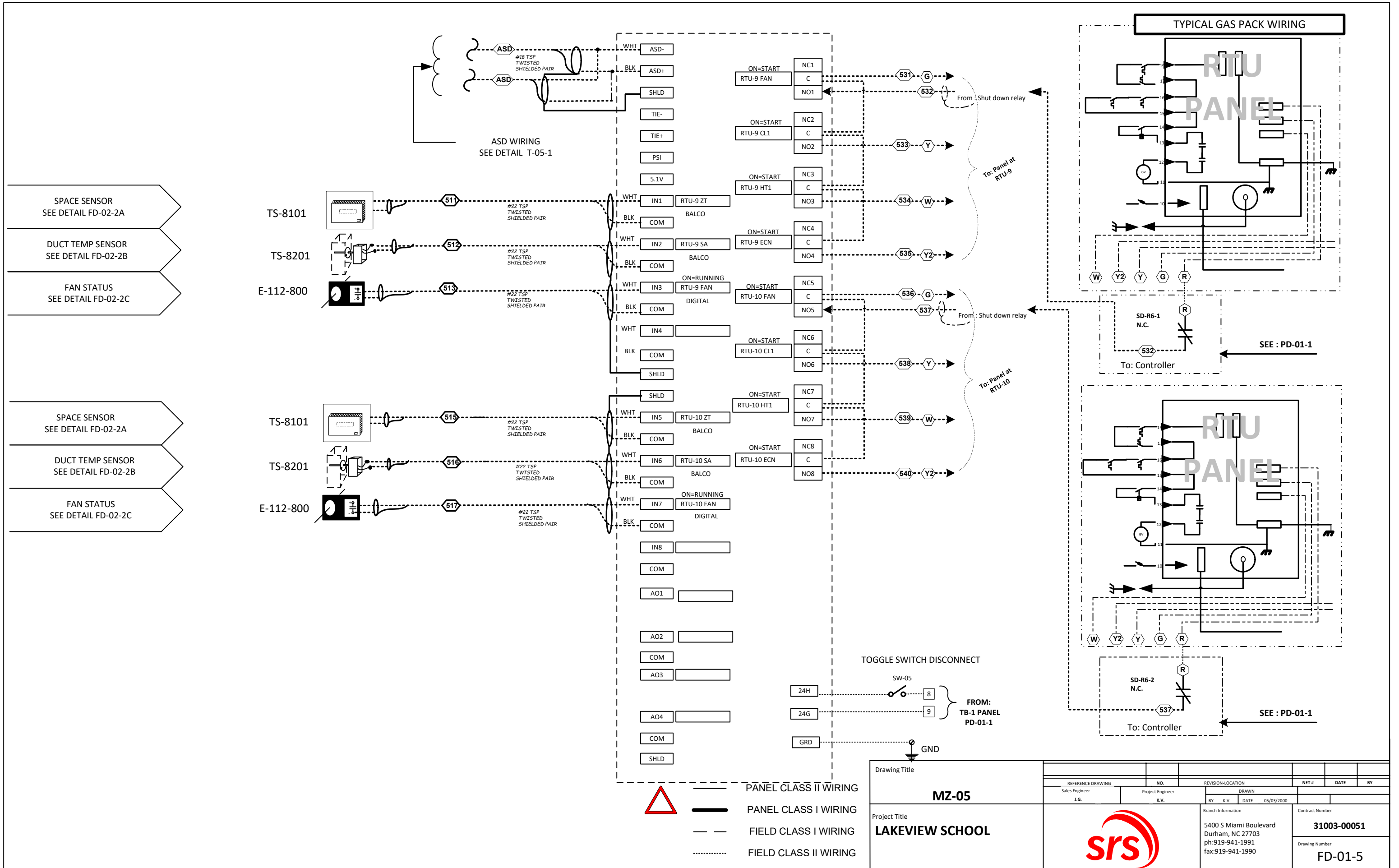


- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

Drawing Title		MZ-04		NO.	REVISION-LOCATION	NET #	DATE	BY
REFERENCE DRAWING	Project Engineer	NO.	DATE	NO.	DATE	NO.	DATE	NO.
J.G.	K.V.		05/03/2000					
Project Title		LAKEVIEW SCHOOL		Branch Information		Contract Number		
				5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		
						Drawing Number		
						FD-01-4		

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.

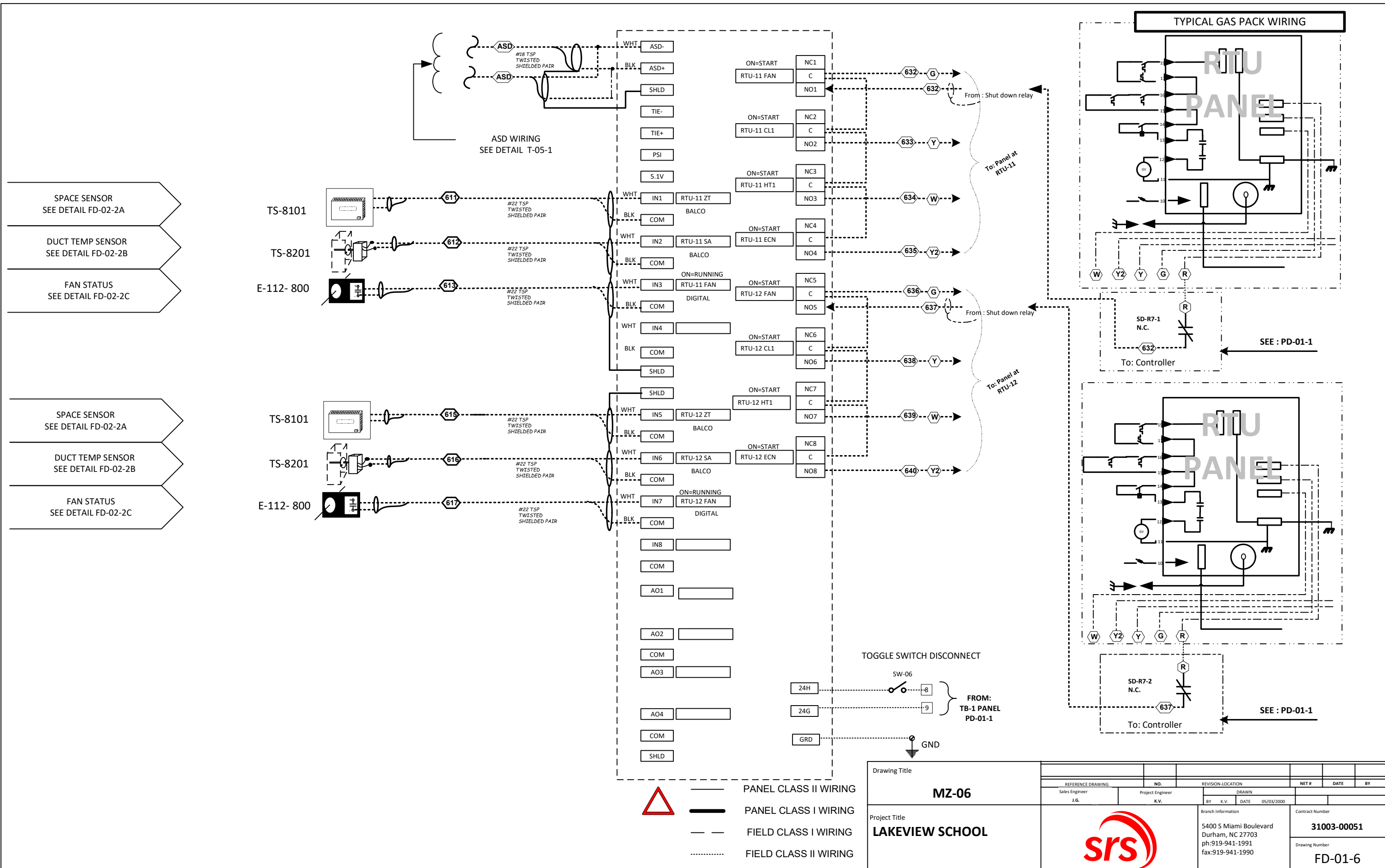




1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
MZ-05								
Project Title		Project Engineer		DRAWN		Contract Number		
LAKEVIEW SCHOOL		K.V.		BY K.V. DATE 05/03/2000		31003-00051		
		Branch Information		Drawing Number				
		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		FD-01-5				

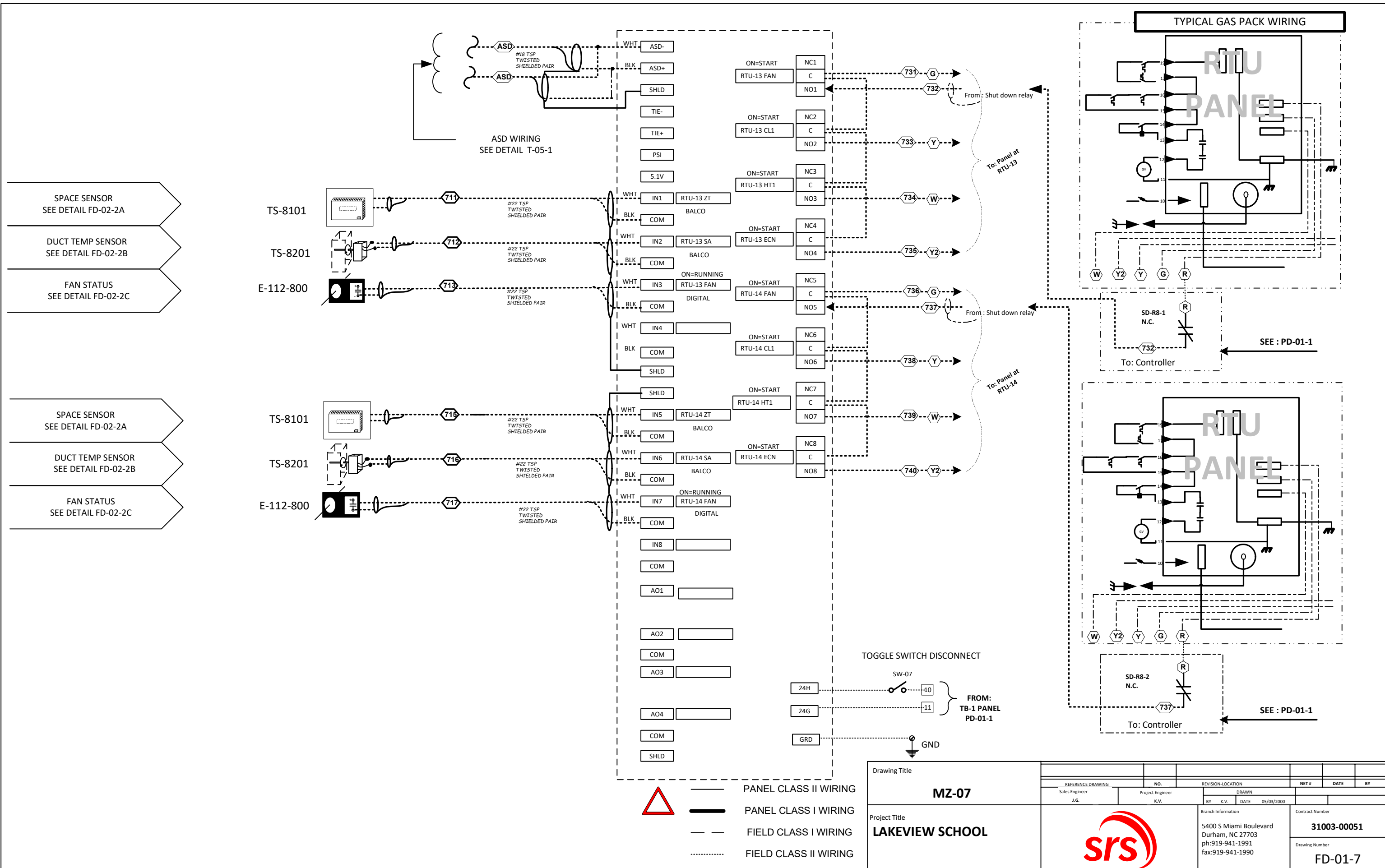




1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
MZ-06								
Project Title	Project Engineer	Branch Information	Contract Number					
LAKEVIEW SCHOOL	K.V.	5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990	31003-00051					
Drawing Number								
FD-01-6								

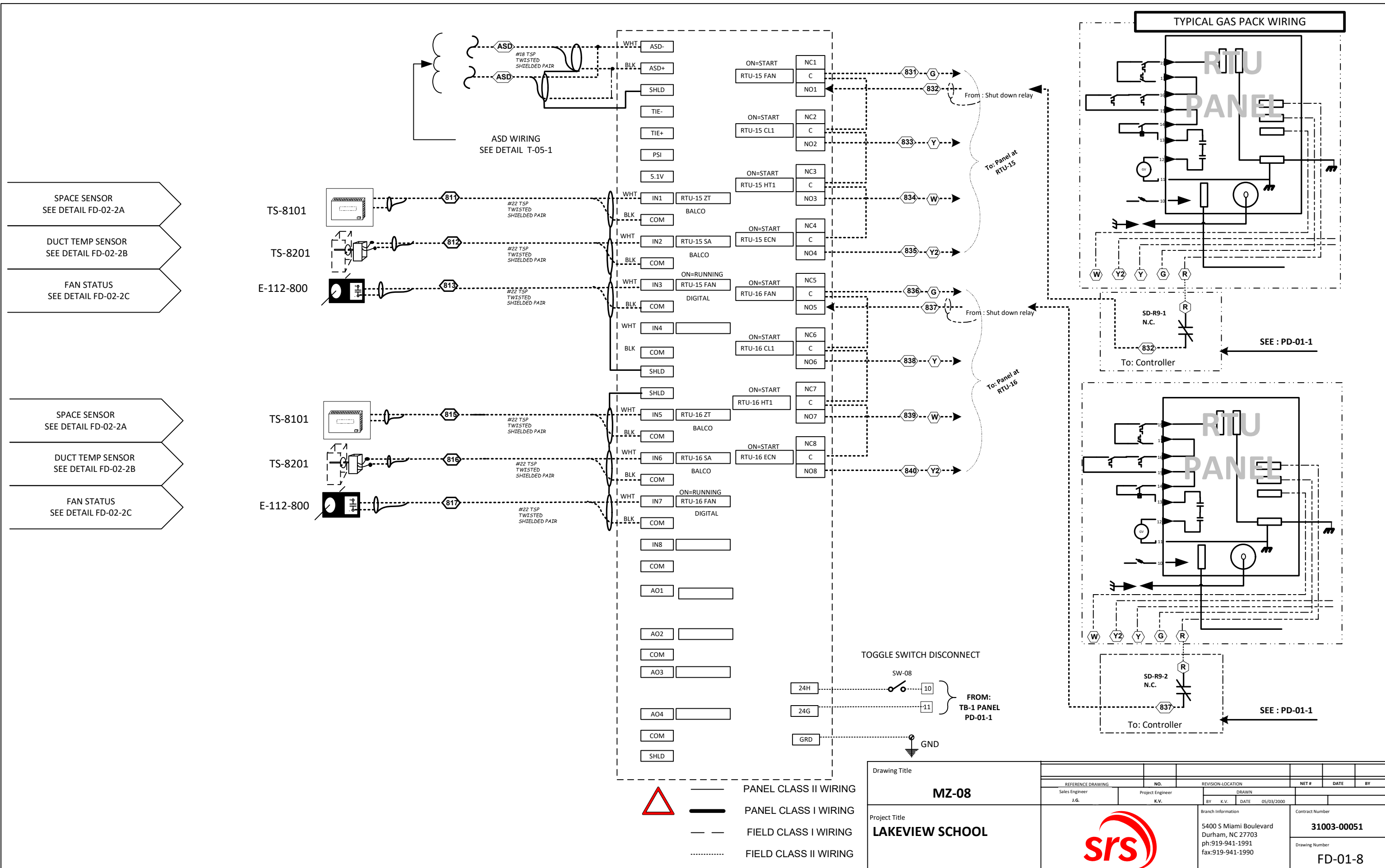




1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
MZ-07								
REFERENCE DRAWING	Project Engineer	DRAWN		DATE		Contract Number		
J.G.	K.V.	BY K.V.		DATE 05/03/2000		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		
Project Title						Drawing Number		
LAKEVIEW SCHOOL						FD-01-7		31003-00051





SPACE SENSOR
SEE DETAIL FD-02-2A

DUCT TEMP SENSOR
SEE DETAIL FD-02-2B

FAN STATUS
SEE DETAIL FD-02-2C

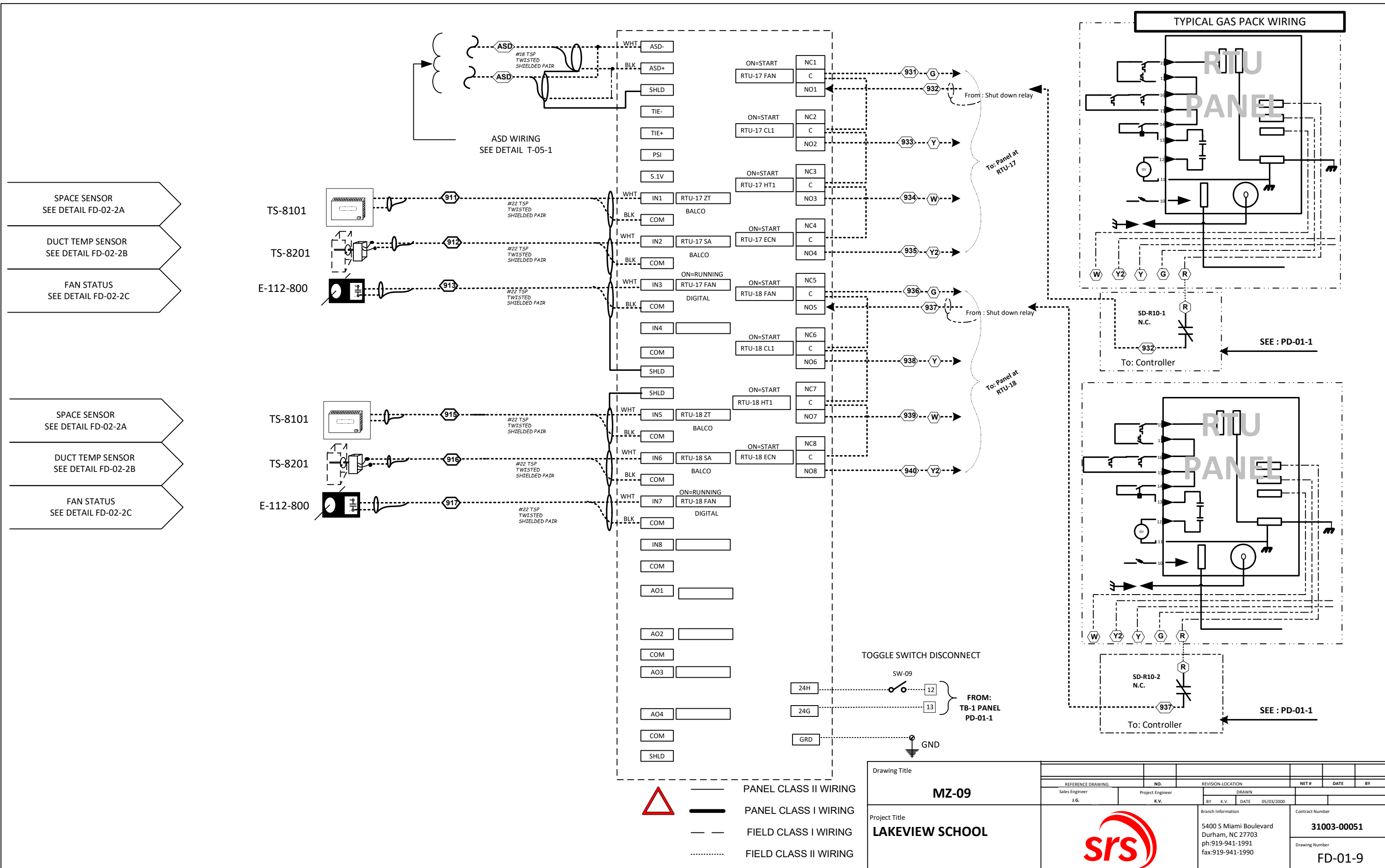
SPACE SENSOR
SEE DETAIL FD-02-2A

DUCT TEMP SENSOR
SEE DETAIL FD-02-2B

FAN STATUS
SEE DETAIL FD-02-2C

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
MZ-08		REFERENCE DRAWING	DRAWN		DATE			
		Sales Engineer J.G.	Project Engineer K.V.	BY	K.V.	DATE	05/03/2000	
Project Title LAKEVIEW SCHOOL		Branch Information			Contract Number			
		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990			31003-00051			
					Drawing Number FD-01-8			

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.

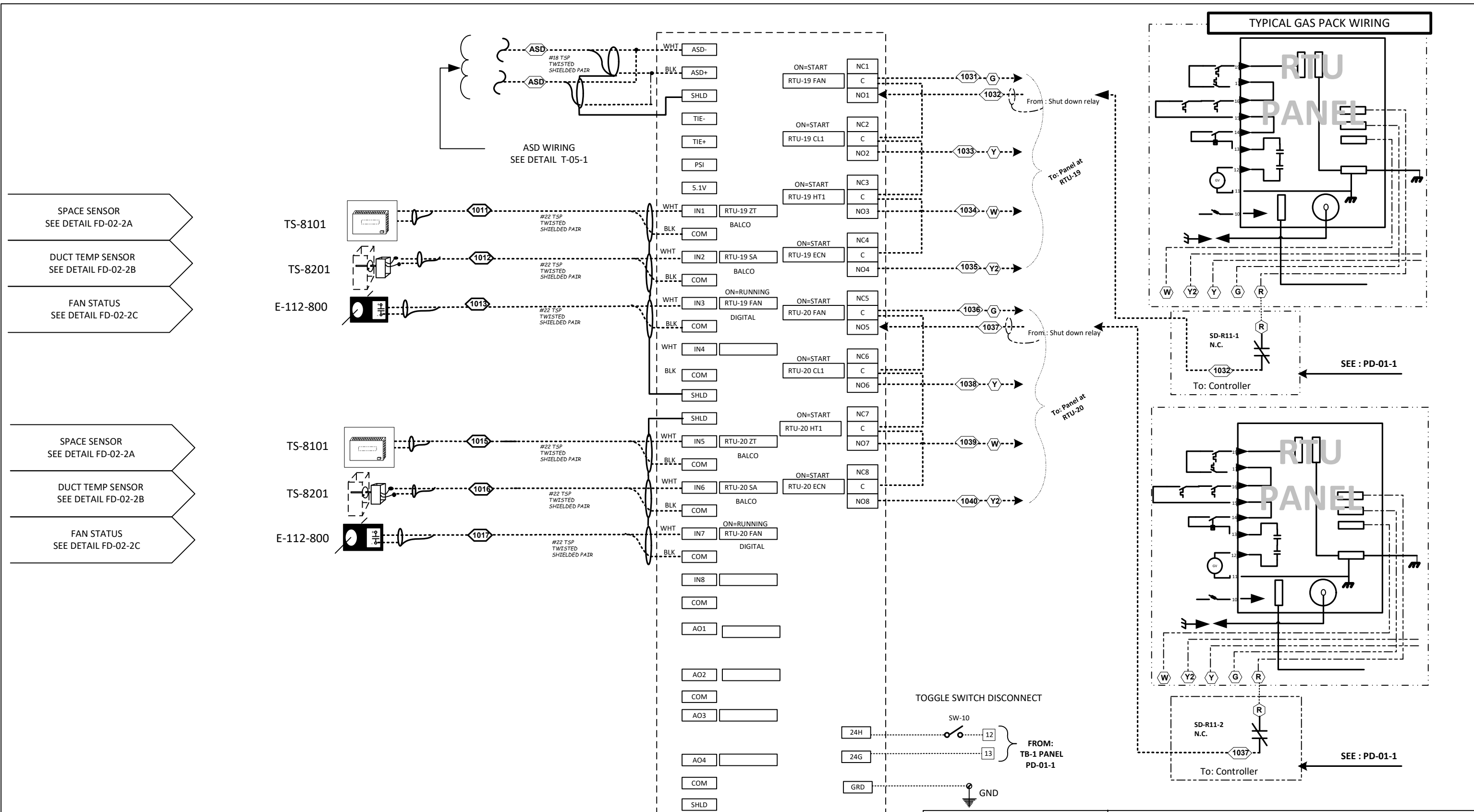


- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title									
MZ-09									
Project Title									
LAKEVIEW SCHOOL									
REFERENCE DRAWING	NO.	REVISION-LOCATION		NET #	DATE	BY			
Sales Engineer	Project Engineer	DRAWN							
J.G.	K.V.	BY	K.V.	DATE	05/03/2000				
Branch Information				Contract Number					
5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990				31003-00051					
				Drawing Number					
				FD-01-9					





SPACE SENSOR
SEE DETAIL FD-02-2A

DUCT TEMP SENSOR
SEE DETAIL FD-02-2B

FAN STATUS
SEE DETAIL FD-02-2C

SPACE SENSOR
SEE DETAIL FD-02-2A

DUCT TEMP SENSOR
SEE DETAIL FD-02-2B

FAN STATUS
SEE DETAIL FD-02-2C

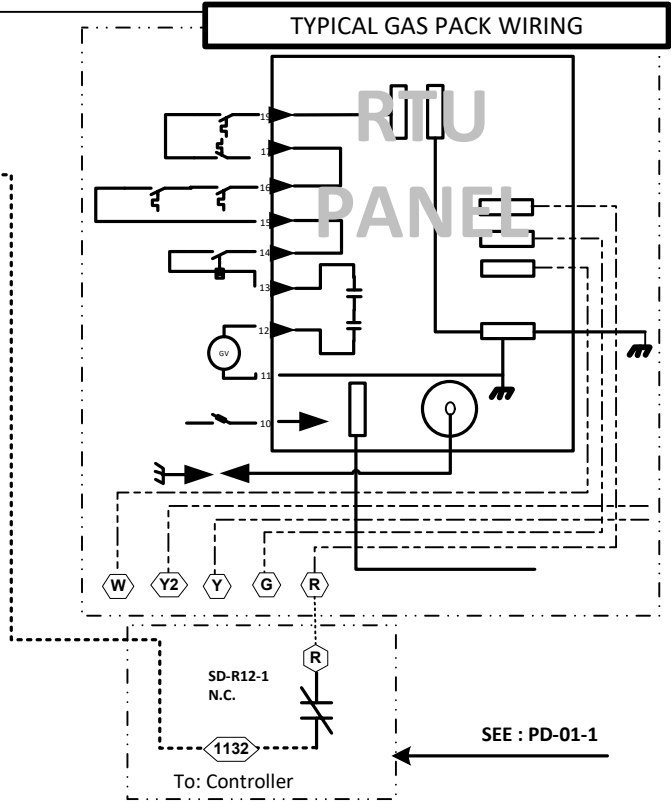
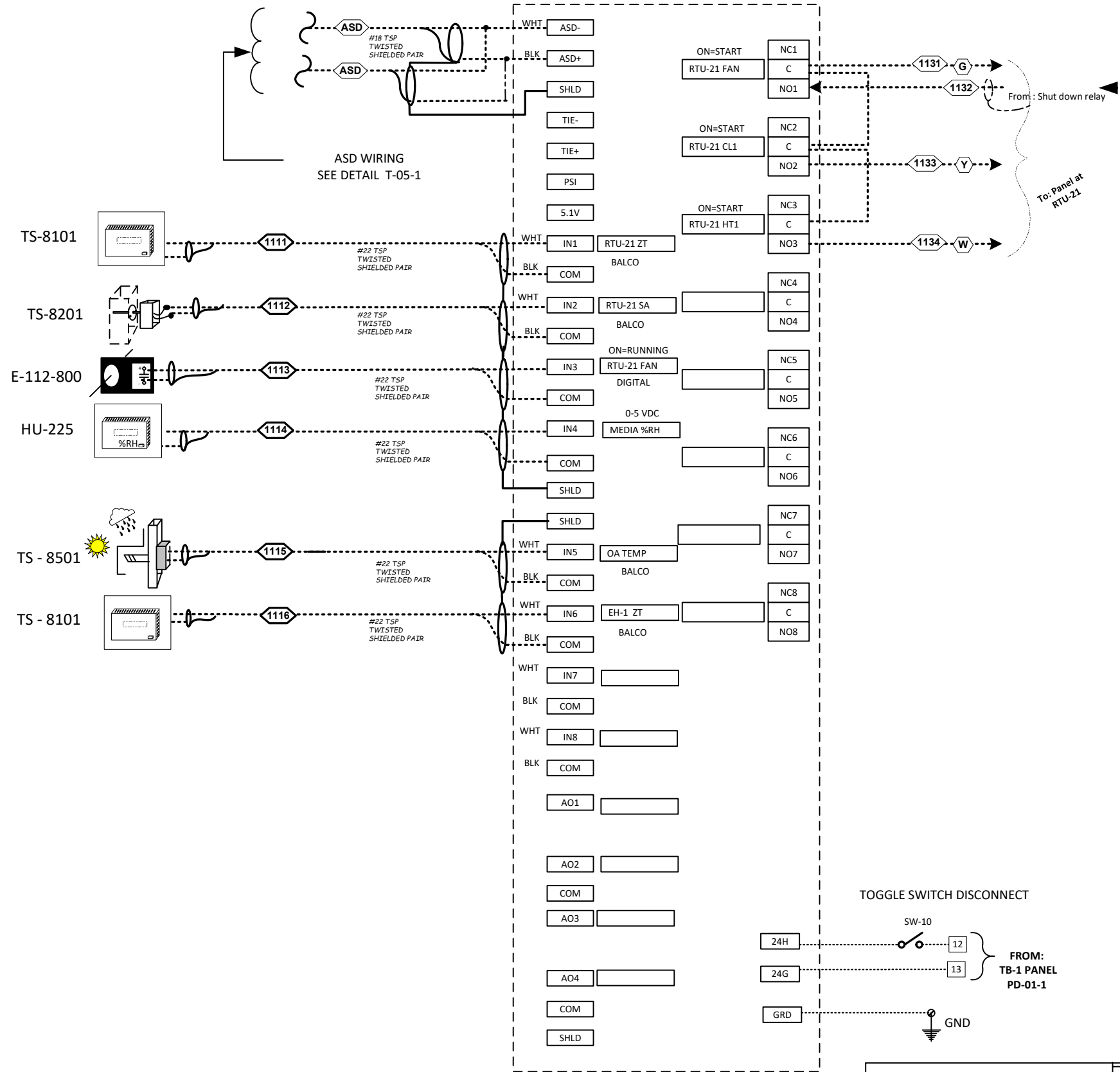
- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
MZ-10								
Project Title	REFERENCE DRAWING	Project Engineer	DRAWN	Branch Information		Contract Number		
LAKEVIEW SCHOOL	J.G.	K.V.		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		
			DATE			Drawing Number		
			05/03/2000			FD-01-10		



- SPACE SENSOR
SEE DETAIL FD-02-2A
- DUCT TEMP SENSOR
SEE DETAIL FD-02-2B
- FAN STATUS
SEE DETAIL FD-02-2C
- % RH WALL MOUNT
SEE DETAIL FD-02-3A
- OA SENSOR
SEE DETAIL FD-02-3C
- SPACE SENSOR
SEE DETAIL FD-02-2A

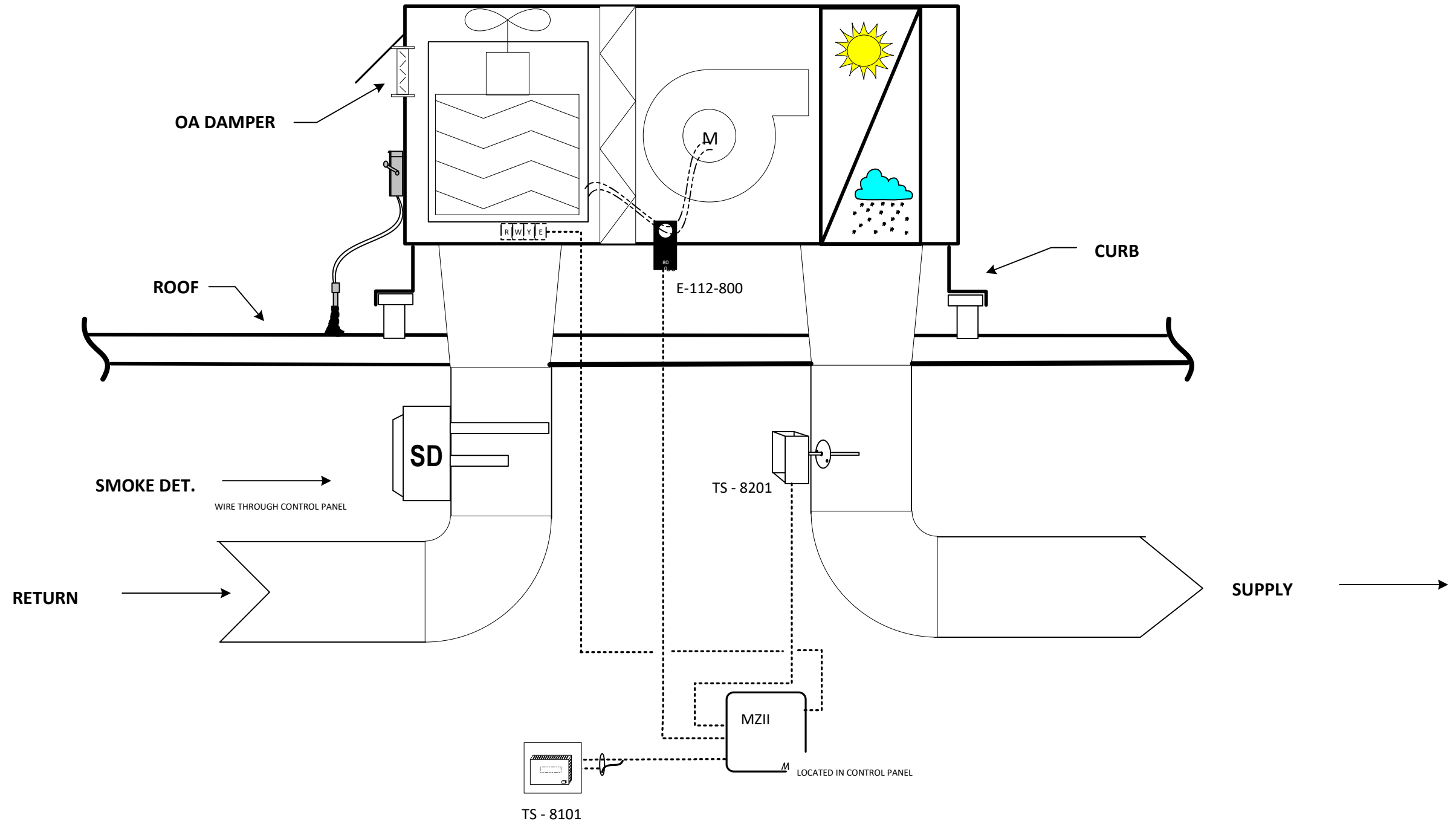


- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

Drawing Title		1		Switch oa tmp location				
Project Title		NO.		REVISION-LOCATION		NET #	DATE	BY
LAKEVIEW SCHOOL		J.G.		K.V.		05/03/2000		
Branch Information		Contract Number		Drawing Number				
5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		FD-01-11				

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.





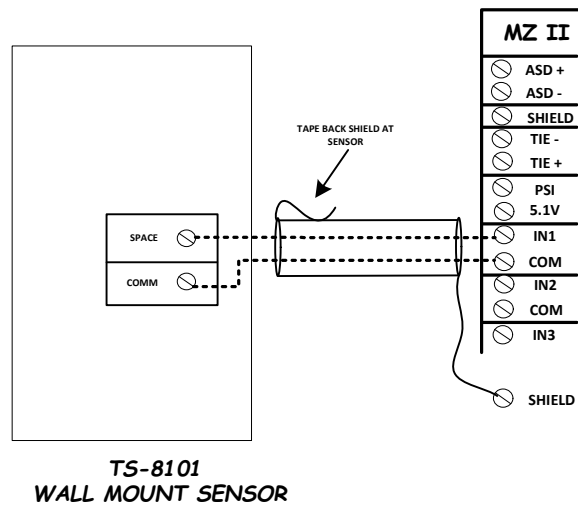
- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- - - FIELD CLASS I WIRING
- FIELD CLASS II WIRING



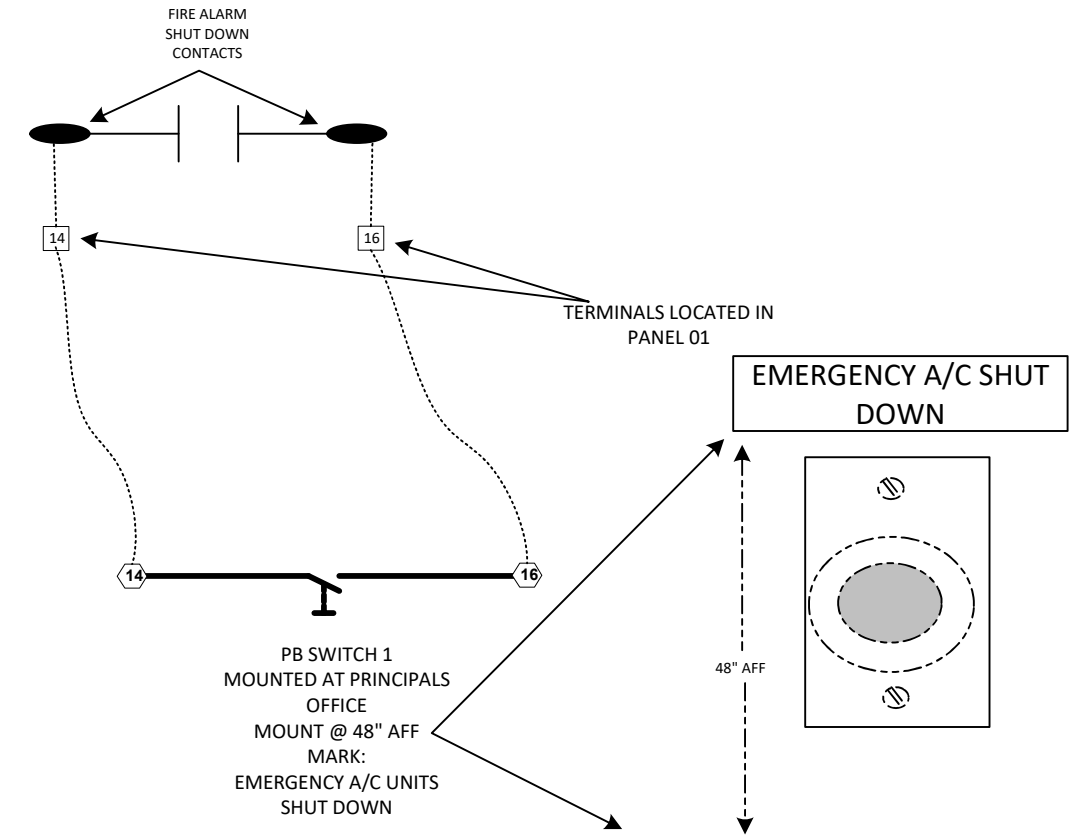
1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		TYPICAL RTU		NO.	REVISION-LOCATION	NET #	DATE	BY
REFERENCE DRAWING	NO.	REVISION-LOCATION	NET #	DATE	BY			
Sales Engineer	Project Engineer	DRAWN						
J.G.	K.V.	BY	K.V.	DATE	05/03/2000			
Project Title		LAKEVIEW SCHOOL		Branch Information		Contract Number		
				5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		
						Drawing Number		
						FD-02-1		

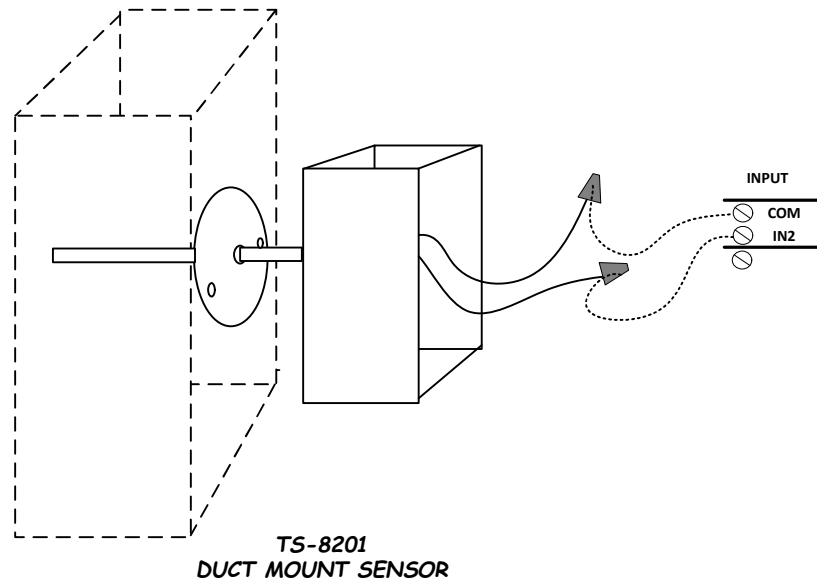




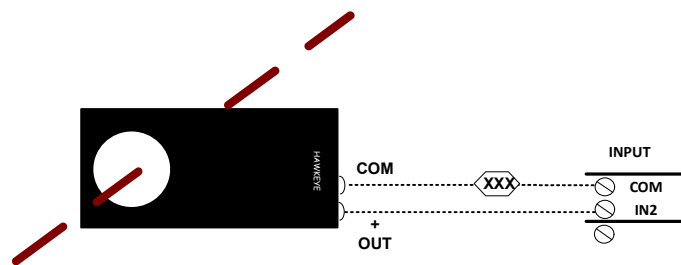
2
A



2
D



2
B



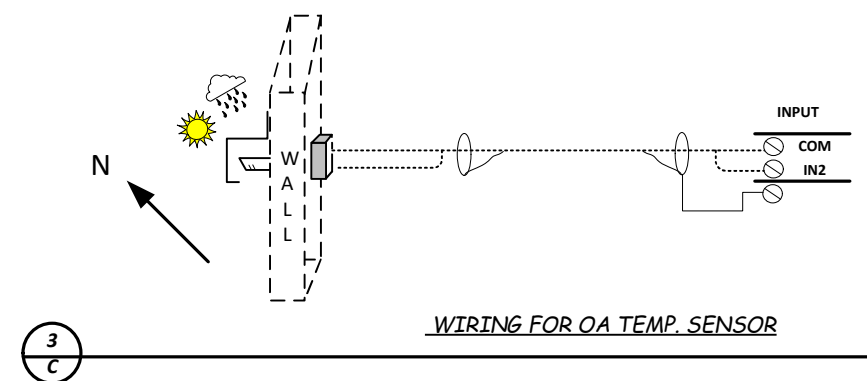
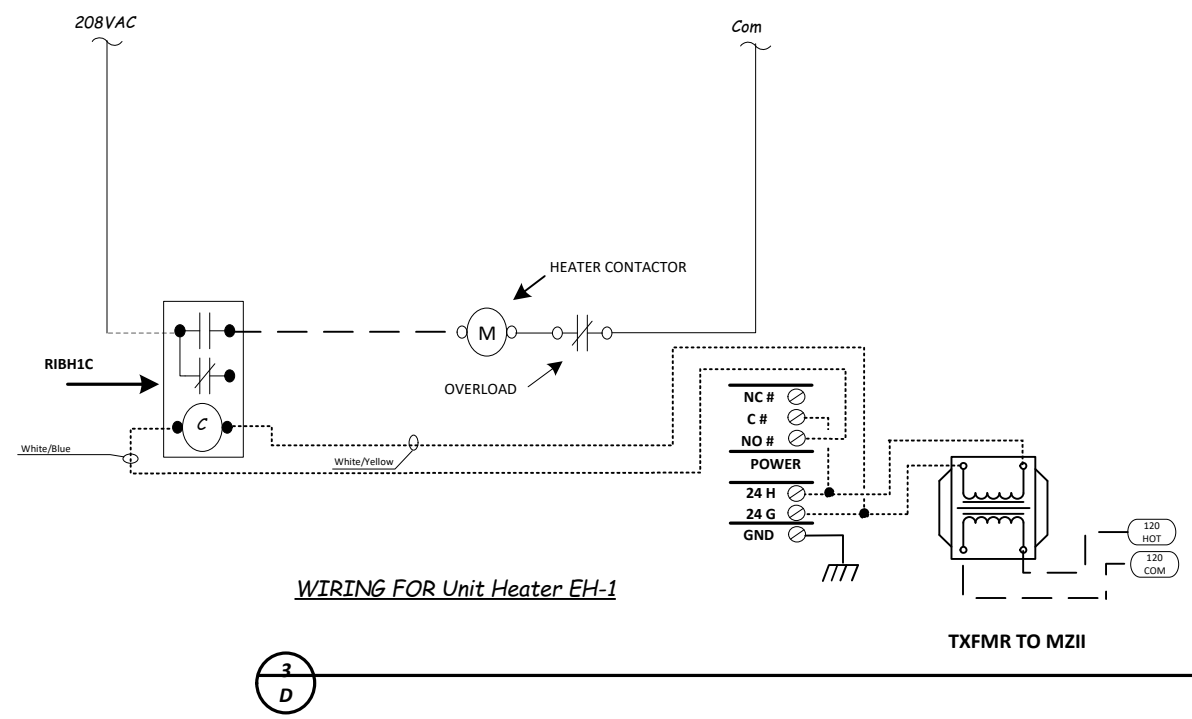
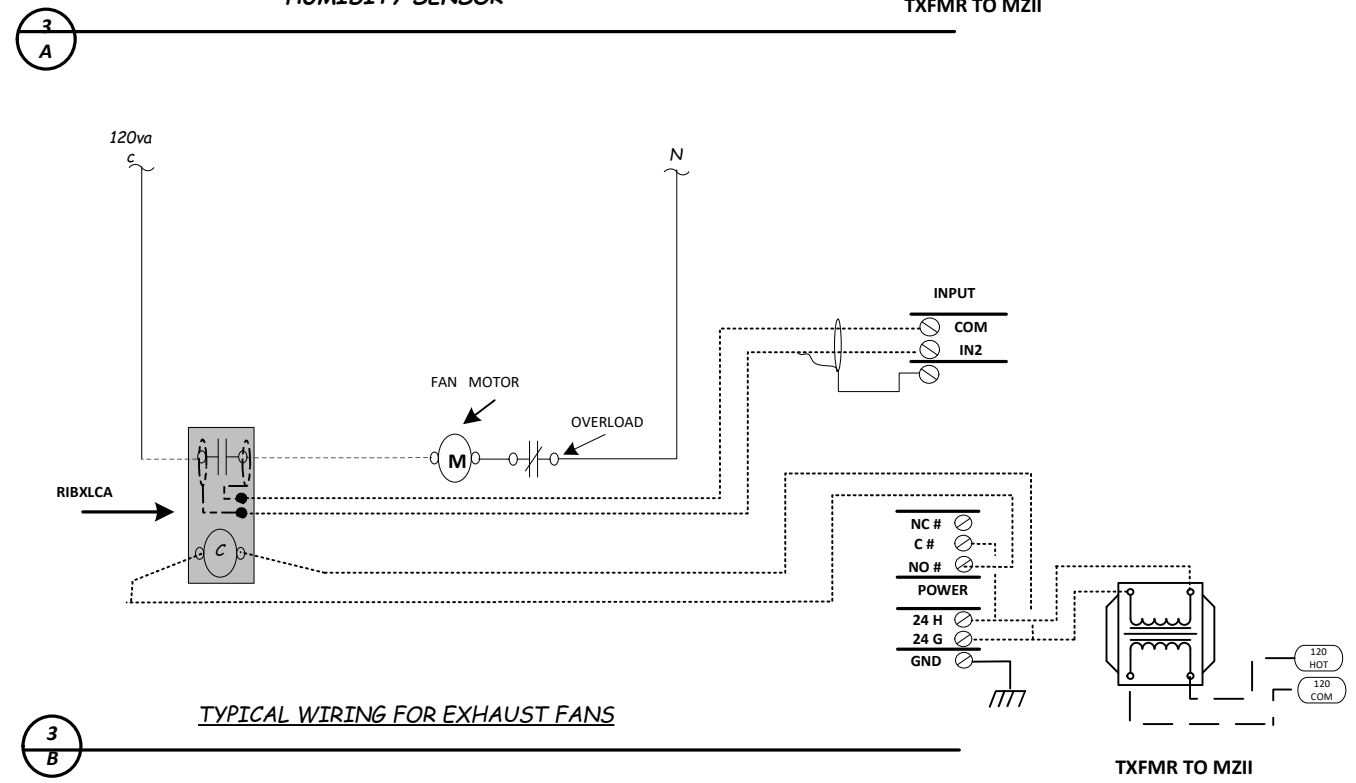
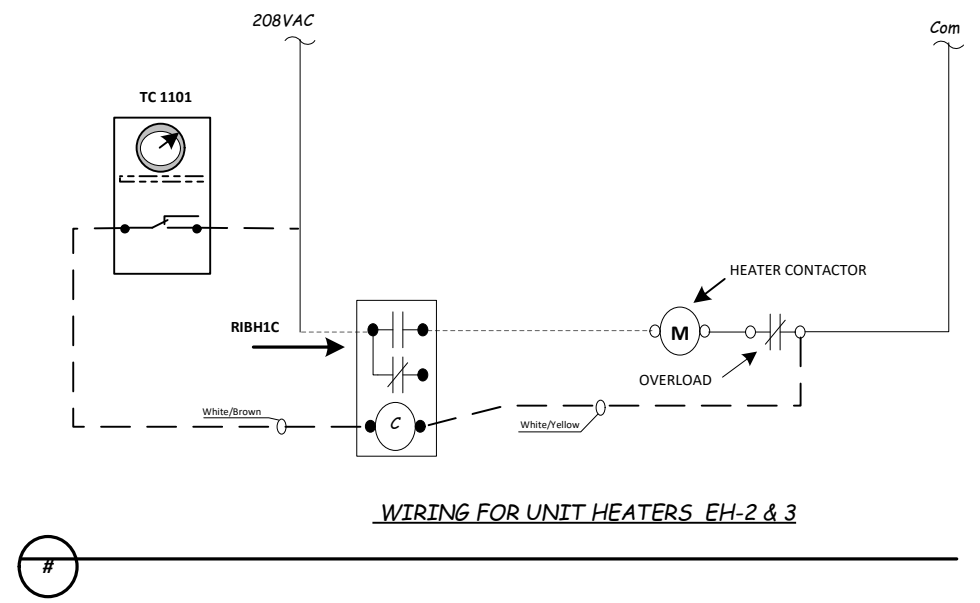
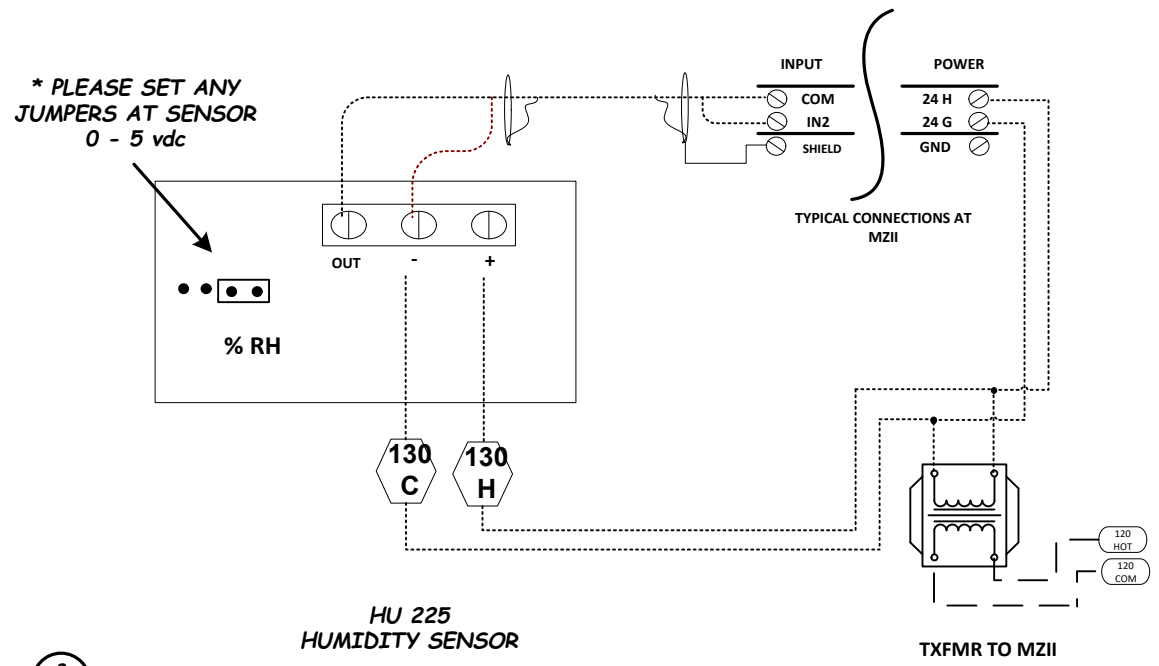
2
C

- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

- 1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
- 2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
SENSOR DETAILS								
REFERENCE DRAWING	Project Engineer	DRAWN		DATE		Contract Number		
Sales Engineer	J.G.	K.V.	BY K.V.		05/03/2000	31003-00051		
Project Title		Branch Information		Contract Number		Drawing Number		
LAKEVIEW SCHOOL		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		FD-02-2		

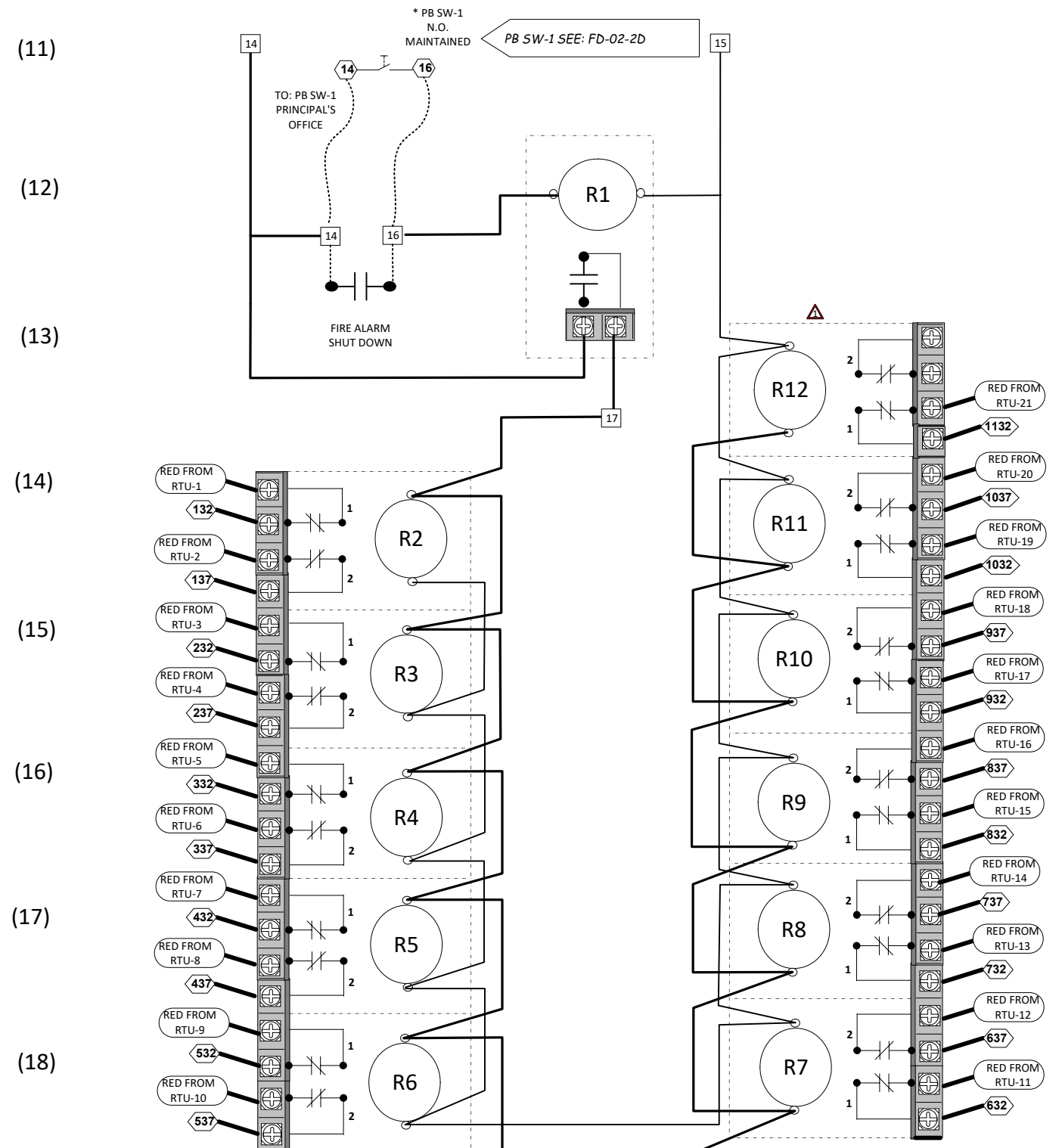
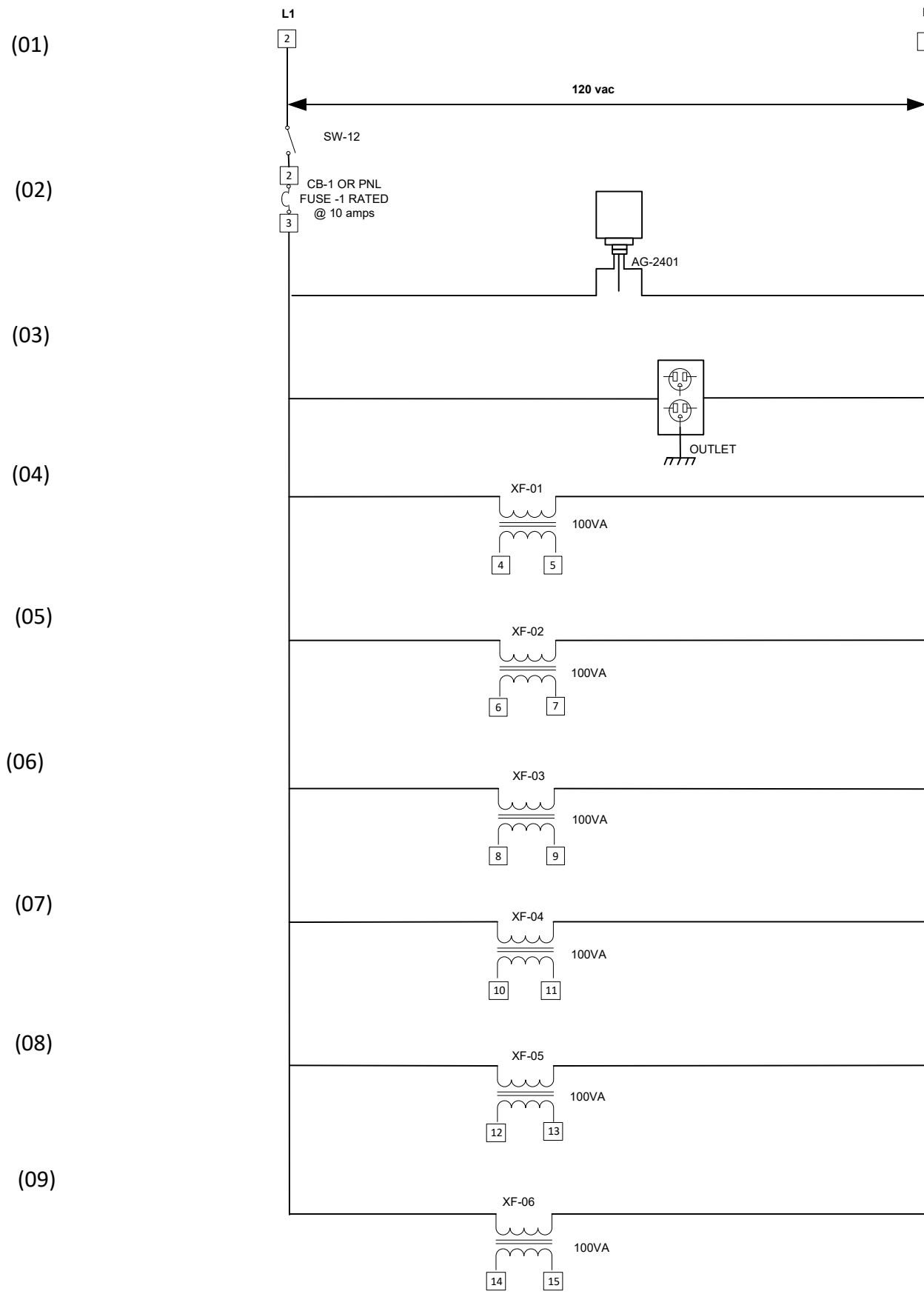




- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title UNIT HEATERS / MISC. DETAILS		NO.	REVISION-LOCATION	NET #	DATE	BY
REFERENCE DRAWING	Sales Engineer	Project Engineer	DRAWN			
J.G.	K.V.	BY	K.V.	DATE	05/03/2000	
Project Title LAKEVIEW SCHOOL			Branch Information		Contract Number	
			5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051	
			Drawing Number FD-02-3			

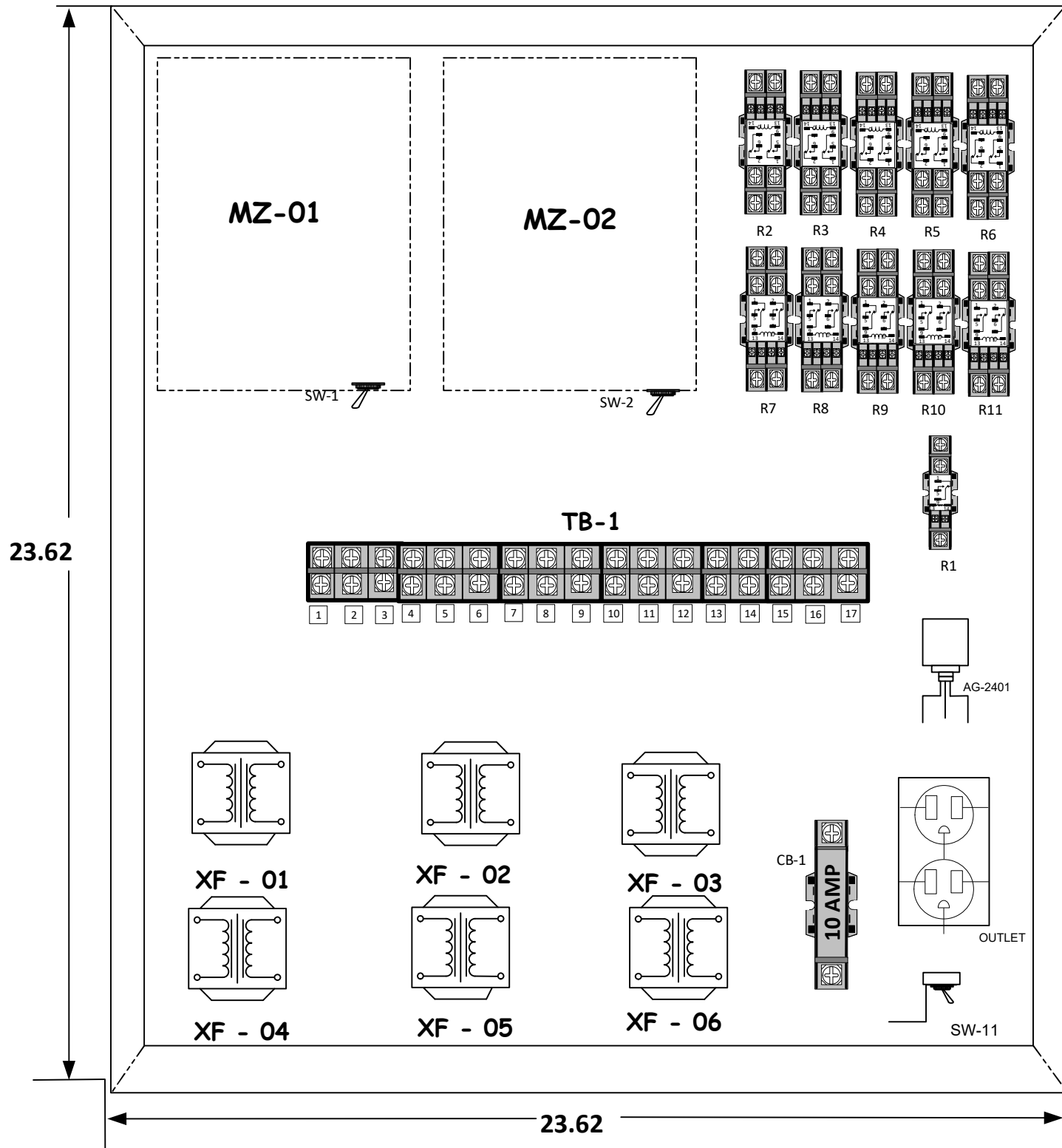






VOLT	120
PHASE	1
FLA	5



- PANEL CLASS II WIRING
- PANEL CLASS I WIRING
- FIELD CLASS I WIRING
- FIELD CLASS II WIRING

1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		NO.		REVISION-LOCATION		1	6/13/00	KV
PANEL WIRING DETAIL						NET #	DATE	BY
Project Title		Project Engineer		DRAWN		Contract Number		
LAKEVIEW SCHOOL		K.V.		BY K.V. DATE 05/03/2000		31003-00051		
Branch Information		Contract Number		Drawing Number		PD-01-1		
5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		srs						

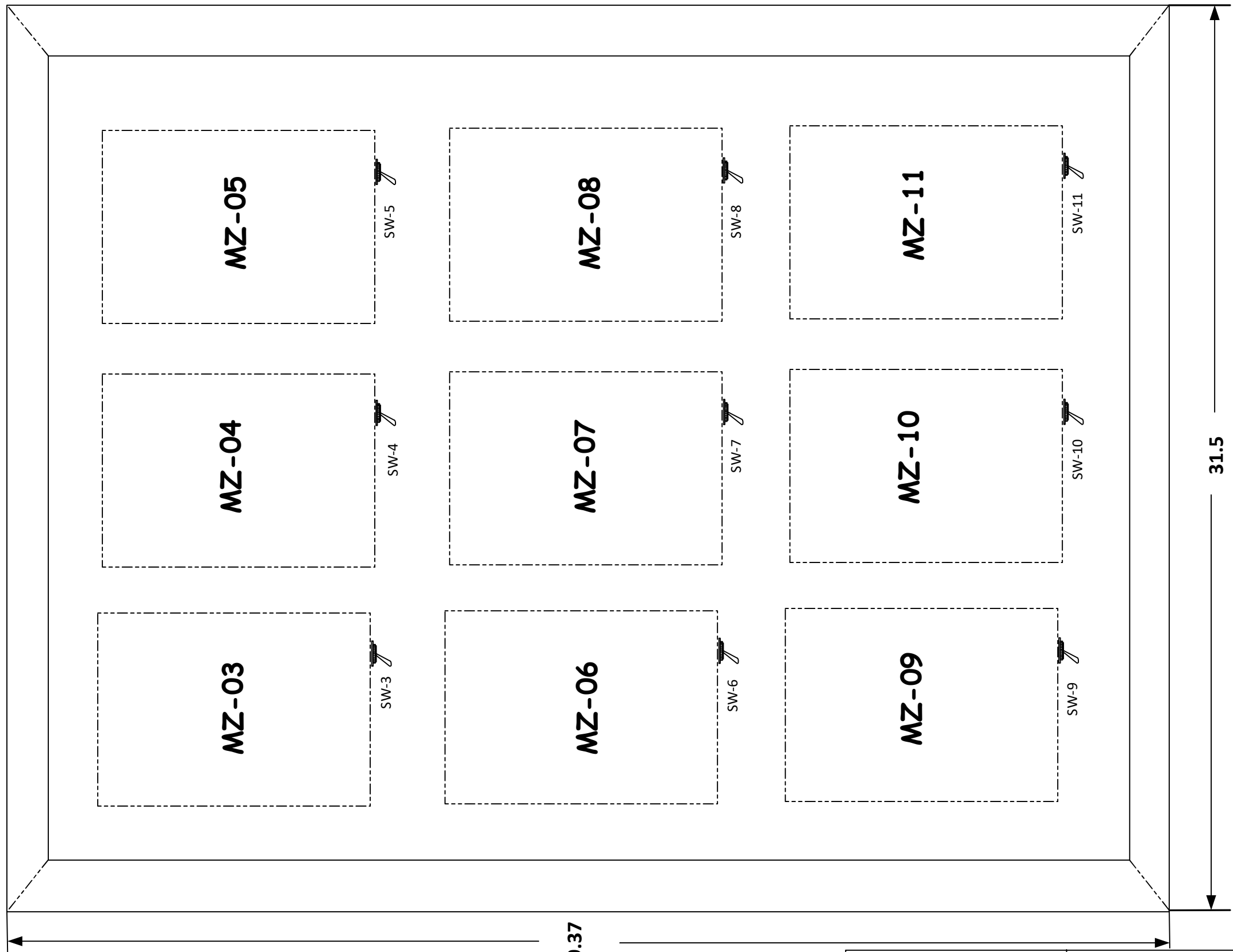


-  ——— PANEL CLASS II WIRING
-  ——— PANEL CLASS I WIRING
-  ——— FIELD CLASS I WIRING
-  FIELD CLASS II WIRING

 1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.





Drawing Title		PANEL 01 LAYOUT	
Project Title	LAKEVIEW SCHOOL		
REFERENCE DRAWING	NO.	REVISION-LOCATION	NET # DATE BY
Sales Engineer J.G.	Project Engineer K.V.	DRAWN BY K.V. DATE 05/03/2000	Contract Number 31003-00051
Branch Information		Drawing Number	
5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		PD-02-1	





39.37

31.5

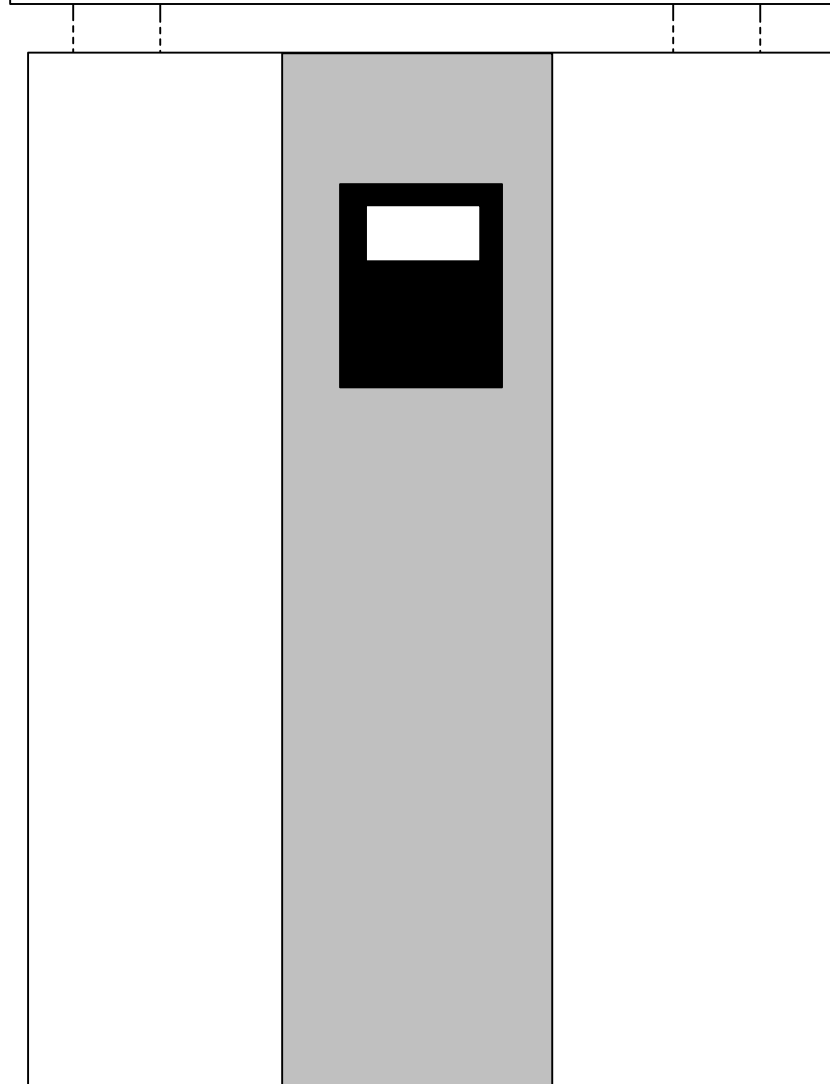
-  PANEL CLASS II WIRING
-  PANEL CLASS I WIRING
-  FIELD CLASS I WIRING
-  FIELD CLASS II WIRING

Drawing Title		NO.		REVISION-LOCATION		NET #	DATE	BY
PANEL 02 LAYOUT								
REFERENCE DRAWING	Project Engineer		DRAWN					
J.G.	K.V.	BY	K.V.	DATE	05/03/2000			
Project Title				Branch Information		Contract Number		
LAKEVIEW SCHOOL				5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		31003-00051		
				srs		Drawing Number		
						PD-02-2		

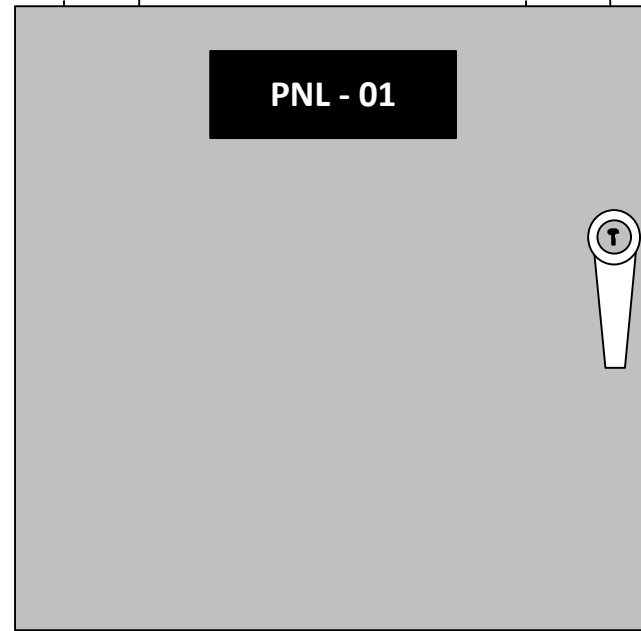
1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
2. ASD BUS IN PURPLE JACKETED CABLE.



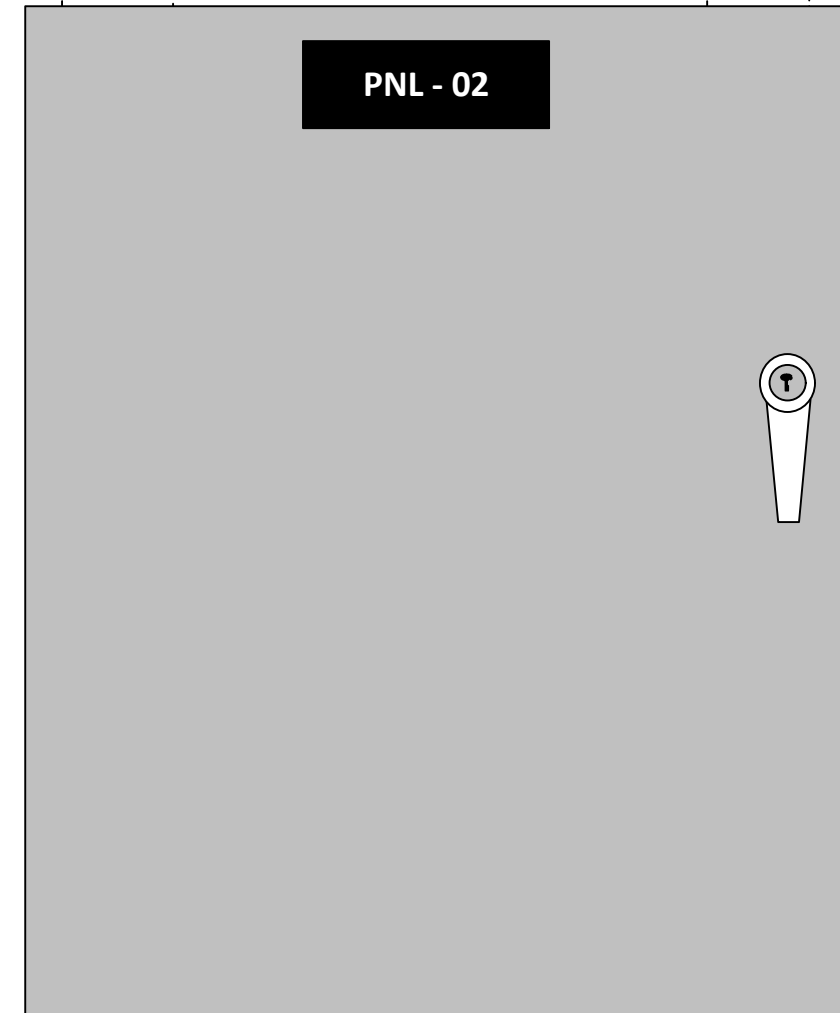
WIRING DUCT







GCM - 01





PNL - 01



PNL - 02

-  ——— PANEL CLASS II WIRING
-  PANEL CLASS I WIRING
-  FIELD CLASS I WIRING
-  FIELD CLASS II WIRING

 1. CLASS II FIELD IN YELLOW JACKET MARKED TEMPERATURE CONTROL CABLE.
 2. ASD BUS IN PURPLE JACKETED CABLE.

Drawing Title		GCM & PANEL LAYOUT		NO.		REVISION-LOCATION		NET #		DATE		BY	
Project Title		LAKEVIEW SCHOOL		Sales Engineer		Project Engineer		DRAWN		DATE		Contract Number	
		J.G.		K.V.		BY		K.V.		05/03/2000		31003-00051	
								Branch Information		5400 S Miami Boulevard Durham, NC 27703 ph:919-941-1991 fax:919-941-1990		Drawing Number PD-02-3	

