

MAXWELL HIGH SCHOOL

PHASE 3D - MAIN BUILDING RENOVATION

990 McELVANEY LANE, NW

LAWRENCEVILLE, GA 30044

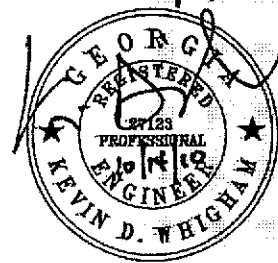
OWNER/DEVELOPER

GWINNETT COUNTY BOARD OF EDUCATION

437 OLD PEACHTREE ROAD, NW

SUWANEE, GA 30024

LPBC PROJECT NUMBER: 210036



DATE: NOVEMBER 9, 2010

LINDSAY POPE BRAYFIELD CLIFFORD & ASSOCS., INC.
ARCHITECTURE / ENGINEERING / INTERIOR DESIGN

SECTION 00 001-G

PROJECT DIRECTORY

MAXWELL HIGH SCHOOL
PHASE 3D - MAIN BUILDING RENOVATION
990 McElvaney Lane, NW
Lawrenceville, GA 30044

OWNER/DEVELOPER/
OWNER'S
REPRESENTATIVE: GWINNETT COUNTY BOARD OF EDUCATION
437 OLD PEACHTREE ROAD, NW
SUWANEE, GA 30024-2978

MIKE ROSZYK, DIRECTOR OF FACILITY PLANNING
53 GWINNETT DRIVE
LAWRENCEVILLE, GA 30046
770-513-6600

ARCHITECTURE AND
STRUCTURAL
ENGINEERING: LINDSAY POPE BRAYFIELD CLIFFORD & ASSOC., INC.
344 WEST PIKE STREET
LAWRENCEVILLE, GA 30046
BECKY POPE; PRINCIPAL
G.D. BRAYFIELD, P.E.; STRUCTURAL ENGINEER
770-963-8989
770-822-9492 (FAX)

CIVIL/LANDSCAPE
ARCHITECTURE: McFARLAND-DYER & ASSOCIATES
4174 SILVER PEAK PARKWAY
SUWANEE, GA 30024
STEVE DUREN, R.L.A.
KEVIN WHIGHAM, P.E.
770-932-6550
770/932-6551 (FAX)

MECHANICAL/
PLUMBING/
ELECTRICAL/
FIRE PROTECT
ENGINEERING: SPURLOCK & ASSOCIATES
2970 CLAIRMONT ROAD, SUITE 620
ATLANTA, GA 30329
BARRY SPURLOCK, P.E.
404-633-0245
404-633-1756 (FAX)

END OF SECTION

TECHNICAL PROVISIONS

MAXWELL HIGH SCHOOL
PHASE 3D - MAIN BUILDING RENOVATION
990 McElvaney Lane, NW
Lawrenceville, GA 30044

DIVISION 0 - BIDDING/CONTRACT REQUIREMENTS

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00 001	Project Directory
00 002	Table of Contents
00 020-G	Advertisement for Bids
00 030	Phasing Schedule
00 100	Instructions to Bidders
00 300-G	Bid Proposal Form
00 500	Contract (Gwinnett - Standard Form of Agreement Between Owner and Contractor (Revision VI, dated 1/20/06) and Attachment Exhibit "A" (Revised 2/12/01)
00 600-G	Bonds & Certificates
00 700-G	General Conditions of the Contract for Construction - GCPS (Revision VI dated 1/20/06)
00 801-G	Supplementary Conditions
00 803	Notice of Commencement
00 900	Addenda and Clarifications

DIVISION 1 - GENERAL REQUIREMENTS

<u>Section</u>	<u>Title</u>
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01 112	Progress Schedules
01 370	Application for Payment Form
01 400	Quality Control
01 500	Construction Facilities and Temporary Controls
01 630	Prior Approvals and Substitutions
01 700	Contract Close-Out
01 710	Cleaning
01 740	Contractor Warranty Form
01 741	Subcontractor Warranty Form
01 742	Statutory Affidavit
01 743	Non-Influence Affidavit
01 744	Immigration and Security Forms

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<u>Section</u>	<u>Title</u>
02 050	Demolition
02 060	Interior Demolition
02 200	Earthwork

02 270	Erosion, Sedimentation and Pollution Control
02 280	Termite Control
02 514	Site Concrete
02 581	Tactile Warning Strips
02 720	Storm Drainage
02 831	Chain Link Fences and Gates
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03 200	Concrete Reinforcement
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04 150	Masonry Reinforcement and Accessories
04 210	Brick Masonry
04 220	Concrete Masonry Units

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05 505	Metal Fabrications
05 521	Steel Pipe and Tube Railings

DIVISION 6 - CARPENTRY

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DIVISION 7 - THERMAL AND MOISTURE PROTECTION

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07 190	Vapor Barriers
07 200	Insulation
07 240	Exterior Insulation and Finish System (EIFS & EFS)
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07 600	Flashing and Sheet Metal
07 651	Wall Flashings
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<u>Section</u>	<u>Title</u>
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09 310	Ceramic, Porcelain and Quarry Tile
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10 100	Visual Display Boards
10 155	Solid Polymer Toilet Partitions
10 440	Signs and Numbers
10 710	Aluminum Canopies

DIVISIONS 11 - EQUIPMENT

<u>Section</u>	<u>Title</u>
11 402	Kitchen Equipment (Not in Contract)

DIVISIONS 12 - FURNISHINGS - N/ADIVISIONS 13 - SPECIAL CONSTRUCTION - N/ADIVISIONS 14 - CONVEYING SYSTEMS - N/ADIVISION 15 - MECHANICAL

<u>Section</u>	<u>Title</u>
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15 300	Sprinkler System
15 400	Heating, Ventilating and Air Conditioning (HVAC)
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END OF SECTION

SECTION 00 020

ADVERTISEMENT FOR BID

**MAXWELL HIGH SCHOOL-PHASE 3D-MAIN BUILDING RENOVATION
GWINNETT COUNTY BOARD OF EDUCATION
GWINNETT COUNTY, GEORGIA**

1. ADVERTISEMENT

Sealed Bids will be received from bidders by the Gwinnett County Board of Education, 53 Gwinnett Drive, Lawrenceville, GA 30046, Bldg. "C" Conference Room: The furnishing of all labor, materials, and services necessary to perform the construction of Maxwell High School - Phase 3D – Main Building Renovation, until **3:00 p.m. local time, Tuesday, December 7, 2010**. Bids will be opened publicly and will be read aloud at the time and place stated above. Fax transmittals and E-mails of Bid Proposal Form shall not be accepted by the Owner. Proposals received after the above time is called will not be accepted. No phones will be available.

2. PREQUALIFICATION

All bidders must pre-qualify in order to be eligible to attend the mandatory pre-bid conference and to be eligible to submit a bid on this project. AIA Document A305, Contractor's Qualifications Statement and other required information noted below, must be submitted to the Architect **no later than 5:00 pm on Wednesday, November 17, 2010** to be evaluated by the Owner and Architect. Contractor will be notified of their eligibility to attend the mandatory prebid conference and to submit a bid after this evaluation. The A305 document must show the Contractor's ability to complete the Contract in a satisfactory manner on occupied-school renovation projects of similar scope and complexity. References from past clients and projects must be included and will be verified. The following must be included as a minimum:

1. General Company Information and Experience
 - a. Contractor's Qualifications Statement (utilize AIA Document A305 form) with all previous critical construction experience. Part of the experience must reference similar **Educational Facilities** of relevant size and scope.
 - b. Workman's Compensation Insurance Modifier for the past three years.
 - c. List of trades proposed to be self-performed on this project.
 - d. Bonding capability and name of bonding company.
2. Project Team Information
 - a. Organization Chart
 - b. Resumes for key personnel (include superintendent, project manager and upper management personnel with ultimate responsibility for the project), length of time with firm, previous clients served and a description of each member's proposed role in this project.
3. References: List Owner and Architect references for five similar projects completed within the past seven years, including a contact name, current phone numbers, fax number and email address.

Bidding documents must be obtained by **prequalified bidders** at the office of Lindsay Pope Brayfield Clifford & Assoc., Inc., Architects and Engineers, 344 West Pike Street,

Lawrenceville, Georgia 30046. Applications for bidding documents together with a deposit of \$150.00 per set must be received by the Architect prior to issuance of the documents to Contractors. These bidding documents, including all drawings and project manuals, will be forwarded from the Architect's office via Federal Express, as soon as possible if the Contractor elects to have them shipped. **Documents will be available after November 9, 2010.**

Plans may be published to Subcontractors or Material Suppliers as full sets only, at a fee of \$150.00, which is non-refundable. A copy of the bidding documents, including drawings and project manuals shall be available at the Architect's office, the Owner's office, and the following plans rooms: AGC Plan Room c/o Gainesville Whiteprint, AGC/ Builders Exchange, LDI, McGraw Hill Construction Dodge and Reed Construction Data.

After the pre-qualification process, a **mandatory Pre-Bid Conference will be held at the Maxwell High School site, 990 McElvaney Drive NW, Lawrenceville, GA 30044, on Monday, November 22, 2010, at 1:00 p.m.** Failure to attend the Pre-Bid Conference shall result in disqualification of the bidder. Representative shall be Project manager or Estimator directly responsible for the bidding of this project.

Any bidder may be required, at the discretion of the Owner, to furnish evidence satisfactory to the Owner that his proposed subcontractors have sufficient means and experience in the types of work called for to assure completion of the contract in a satisfactory manner. Any bidder that is disqualified may respond to the Owner in writing within 20 days of the Notice of Disqualification as to why the bidder feels that the disqualification is unfounded. The written appeal from the disqualified bidder will not change the decision already made on this project. However, a favorable appeal may open the way for the bidder in question to bid on future Gwinnett County Public School System projects.

3. THE PROJECT WILL CONSIST OF THE FOLLOWING:

- a. January 10, 2011 – May 29, 2011: Renovate approximately 4,700 square feet of lower level of existing occupied building into a Culinary Arts Kitchen Suite.
- b. May 29, 2011 – July 15, 2011: Renovate approximately 12,300 square feet of lower level of existing building.
- c. May 29, 2011 – July 15, 2011: Renovate approximately 28,600 square feet of upper level of existing building, along with exterior canopies and playground areas.
- d. May 29, 2011 – July 15, 2011: Reroof approximately 35,200 square feet.
- e. Work will include, but is not limited to, new lights/ HVAC/ ceilings/ floors/ paint/ doors/ windows/ roof/ toilets/ cabinetry. Areas to be renovated are mostly specialty labs such as Cosmetology, Childcare, Graphic Arts, Welding, Construction and Healthcare.
- f. Contractors and Subcontractors will be expected to work double-shift hours necessary to meet the tight summer schedule of work. **All work indicated in items b, c and d above must be completed by July 15, 2011.**

4. GENERAL INFORMATION

The full amount of deposit for each set will be refunded to each General Contractor who submits a bona fide bid and upon return of all issued sets bound in good condition, in the proper order, complete and free of all markings, within 30 days after date of opening of bids.

Performance Bond and Labor and Material Payment Bond, each equal to 100% of the Contract Sum, will be required of the successful bidder and from successful Mechanical/HVAC, Plumbing, Electrical, and Roofing Subcontractors.

The above description is an advertisement for the submission of bids which are to be considered as offers for performance of work by the submitting party. The Owner reserves the right to accept or reject any or all bids and to waive technicalities.

ARCHITECT: LINDSAY POPE BRAYFIELD CLIFFORD & ASSOC., INC.
OWNER: GWINNETT COUNTY BOARD OF EDUCATION
J. ALVIN WILBANKS, CEO/SUPERINTENDENT

END OF SECTION

**PROJECT: MAXWELL HIGH SCHOOL
PHASE 3D - MAIN BUILDING RENOVATION
990 McElvaney Lane, NW
Lawrenceville, GA 30044**

BID DATE: DECEMBER 7, 2010

The following activities will be scheduled for the time frames indicated, unless an alternate time is coordinated between the Contractor, the School and the GCPS Contracts Engineer.

	SCOPE OF WORK	START	COMPLETE	REMARKS
1.	Culinary Arts Suite, Lower Level Only	January 10, 2011	July 15, 2011	No work can be performed on 2 nd Level, including shafts, until May 30, 2011
2.	Exterior Canopies, Sitework	May 30, 2011	July 15, 2011	
3.	Balance of Interior Work	May 30, 2011	July 15, 2011	
4.	Re-roofing	May 30, 2011	July 15, 2011	

END OF SECTION

SECTION 00 100

INSTRUCTIONS TO BIDDERS

Each bidder by making his bid represents that he has read and understands the Bid Documents and has visited the site and familiarized himself with the local conditions under which the work is to be performed.

All bids must be prepared on the forms provided by the Architect and submitted in accordance with the Instructions to Bidders, AIA Document A701 1987 attached. A bid is invalid if it has not been deposited at the designated location prior to the time and date for receipt of bids set forth in the advertisement or invitation to bid, or prior to any extension thereof issued to the bidders.

Work under the Contract consists of furnishing all labor and materials required to complete the project entitled:

MAXWELL HIGH SCHOOL
PHASE 3D - MAIN BUILDING RENOVATION
990 McElvaney Lane, NW
Lawrenceville, GA 30044

In accordance with Plans and Specifications prepared by:

Lindsay Pope Brayfield Clifford & Assoc., Inc.
344 West Pike Street
Lawrenceville, Georgia 30046
Phone: 770-963-8989

"Instructions to Bidders", AIA Document A701, Fourth Edition, dated 1987, Articles 1 through 8, shall be applicable to all Bidders and is attached for reference by all Bidders in addition to the following provisions:

- A. Section 1. Article 1 of Chapter 10 of Title 13 of the Official Code of Georgia Annotated, relating to general provisions affecting contracts for public works, is amended by adding at the end of said article a new Code section, to be designated as Code Section 13-10-2, as itemized in attached Exhibit "A" to Standard Form of Agreement between owner and Contractor.
- B. During grading and excavation phases should the following conditions be encountered: mass rock, trench rock (as defined in Section 02 200 - Excavation, Filling and Grading), trench earth excavation, earth excavation, earth fill and unsuitable soils, the Contractor shall immediately notify the Architect who may observe and will determine the appropriate action necessary for the work to proceed. If, in the opinion of the Architect, work in addition to the original contract requirements is required, that portion pertaining to any of the foregoing conditions will be performed on a time and material basis and the contract shall be equitably adjusted by change order in accordance with the GENERAL CONDITIONS and SUPPLEMENTARY CONDITIONS, ARTICLE 7, CHANGES IN THE WORK.

Contractor shall submit unit prices as required on the "bid proposal form". If soils reports indicate unsuitable soils, rock, etc., Contractor shall provide unit prices for removal of unsuitable soil and/or removal of rock on the "proposal form". Unit prices shall also be provided for the addition of replacement fill dirt in areas where unsuitable soil and/or rock is removed and shall be compacted in accordance with the Contract Documents. One replacement unit cost shall be "suitable soil acquired on site" and a second unit cost for "suitable soil acquired off site". Unit and/or lump sum prices shall include cost of material, sales tax, delivery, labor, labor burden, supervision and all other costs other than General Contractor's profit and overhead. The Architect and Owner reserve the right to accept or reject these prices or request the work to be performed on a time and material basis with complete daily breakdowns and logs submitted by the General Contractor.

The subsurface investigations report included with Section 01 100 review contains information used to prepare the foundation and earthwork design, but the contractor may draw his own conclusions. No responsibility is assumed by the Architect or the Owner for subsurface conditions or quality other than at the locations and at the time the exploration was made. No claims for extra compensation or for additional contract time will be allowed due to subsurface conditions inconsistent with the data shown, except as provided elsewhere in the specifications.

- C. Time is of the essence. Notice to Proceed will be issued after the Pre-Construction meeting as soon as all required paper work such as Contracts, Bonds, Insurance, etc. are in order. Contractor shall mobilize within ten (10) days of Notice to Proceed. Construction cannot start until January 10, 2011 and must be substantially complete by July 15, 2011. See Phasing Schedule at Section 00 030.
- D. A bid bond in the amount of 5% of the base bid shall accompany the bid. The Attorney-In-Fact who signs the bid bond must file with the bid bond a certified copy of his Power of Attorney to sign such bond. Certified checks and cash are not acceptable.
- E. Neither the Contractor, nor his material suppliers, nor his Subcontractors shall install or otherwise incorporate any materials containing asbestos, PCB or other hazardous materials within the boundaries of the Project. No soil found on site, or transported to the site from remote locations which is contaminated with material containing asbestos, PCB, Radon, gasoline, fuel oil, diesel fuel or other similar fossil fuels shall be used for fill, backfill or landscape topsoil.
- F. If the Contractor or his Subcontractors or material suppliers have knowledge that, or believe that an item, component, material or accessory within a product or assembly may contain asbestos, PCB or other such hazardous material, it is the Contractor's sole responsibility to secure a written certification from the manufacturer of any suspected material stating this material is totally free of asbestos, PCB or other hazardous materials. A copy of the written certification shall be submitted to the Owner and Engineer.
- G. Each bidder represents that his proposal is based upon the materials and equipment described in the contract documents.

- H. When references are made in the specifications to trade names, or to the names of manufacturers, such references are made solely to designate and identify the quality of the equipment or material to be furnished, and are not intended to restrict competitive bidding. In case the Contractor wishes to use material and equipment other than those specified, **PRIOR WRITTEN REVIEW** of the Engineer must be obtained.
- I. If it is desired to use equipment or materials of different manufacturer or trade names from those specified, application for review of such equipment or materials must reach the hands of the Engineer at least ten (10) days prior to the date set for the opening of bids. Application for review must be accompanied by supporting data clearly proving equality of the proposed substitute to that specified. To be acceptable, a substitute must be equal, or exceed, all requirements of the base specifications, including space limitations. A comparative data schedule shall accompany the submittal. Any changes in the work which might be required to accommodate the proposed substitute shall be clearly shown and described. Should the proposed substitute be accepted, any such changes required in other work due to the use of the substitute shall be coordinated and accomplished by the Contractor as part of the Contract at no additional cost to the Owner.
- J. **REVIEW** of substitutes will be made by written addendum, issued to all prospective bidders, and mailed from the Engineer's office seven (7) days prior to the date set for the opening of bids.
- K. No consideration can be given to requests for review received later than ten (10) days prior to the day set for the opening of bids.
- L. Substitutions or product equals will be considered during bidding only and not during construction except as described in Specification Section 01 630, Paragraph 1.3A.
- M. Before visiting the site for any reason prior to the proposal date, all prospective bidders (General Contractor and Sub-Contractors) shall call the administrative office of the school and notify the administrative personnel of the day and time when they plan to visit the site. Upon arriving at the school, the representatives of the prospective bidders will then sign-in at the administrative office area and obtain the necessary number of visitor badges which are to be worn while on school property. Upon completion of the site visit, the prospective bidder's personnel will then return their visitor badges to the office and sign out. Failure to comply with the above mentioned procedure will result in the personnel involved being asked to vacate the facility and site whether or not they have completed their investigation.
- N. On additions, renovations, and/or modifications to existing school facilities, the AHERA (Asbestos Hazard Emergency Response Act) rules require that a Management Plan be on file in the office of the school system and this is available for the bidders consultation; however, the bidder may not remove this document from the school office. Copies may be obtained at a cost of \$0.20 per sheet. Contact the Owner if you wish to order a complete set or copies of individual pages. The Management Plan shows the areas inside the buildings that tested

positive for ACBM during the required building inspections. If there is any ACBM which will be disturbed by the work included in the contract, the Owner will have it removed, unless specifically stated otherwise in the contract documents.

- O. General Contractors are allowed to amend the Proposal on bid day by indicating an additive or deductive cost on the outside of the sealed envelope. Changes to the required list of Sub-Contractors can also be indicated on the outside of the sealed envelope. No changes will be allowed once time is called and the opening of bids has commenced.
- P. The successful bidder will be required to contract with those Sub-Contractors listed on the Proposal Form unless there are objections, in writing, from the Owner or Sub-Contractor. The Sub-Contractor may withdraw, in writing, due to circumstances such as a financial error or being unable to meet certain requirements of the contract documents.

END OF SECTION



AIA Document A701

Instructions to Bidders

1987 EDITION

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INSTRUCTIONS TO BIDDERS

ARTICLE 1 **DEFINITIONS**

1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

1.4 A Bid is a complete and properly signed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

1.5 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.

1.6 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.

1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

1.8 A Bidder is a person or entity who submits a Bid.

1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

ARTICLE 2 **BIDDER'S REPRESENTATIONS**

2.1 The Bidder by making a Bid represents that:

2.1.1 The Bidder has read and understands the Bidding Documents and the Bid is made in accordance therewith.

2.1.2 The Bidder has read and understands the Bidding Documents or contract documents, to the extent that such documentation relates to the Work for which the Bid is submitted, for other portions of the Project, if any, being bid concurrently or presently under construction.

2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and

has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

ARTICLE 3 **BIDDING DOCUMENTS**

3.1 COPIES

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

3.1.2 Bidding Documents will not be issued directly to Sub-bidders or others unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.4 In making copies of the Bidding Documents available on the above terms, the Owner and the Architect do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant permission for any other use of the Bidding Documents.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function.

dimension, appearance and quality to be met by any proposed substitution.

3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work including changes in the work of other contracts that incorporation of the proposed substitution would require shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

3.3.4 No substitutions will be considered after the Contract award unless specifically provided in the Contract Documents.

3.4 ADDENDA

3.4.1 Addenda will be mailed or delivered to all who are known by the issuing office to have received a complete set of Bidding Documents.

3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

3.4.3 No Addenda will be issued later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4

BIDDING PROCEDURES

4.1 FORM AND STYLE OF BIDS

4.1.1 Bids shall be submitted on forms identical to the form included with the Bidding Documents.

4.1.2 All blanks on the bid form shall be filled in by typewriter or manually in ink.

4.1.3 Where so indicated by the makeup of the bid form, sums shall be expressed in both words and figures, and in case of discrepancy between the two, the amount written in words shall govern.

4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture

of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

4.1.7 Each copy of the Bid shall include the legal name of the Bidder and a statement that the Bidder is a sole proprietor, partnership, corporation or other legal entity. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

4.2 BID SECURITY

4.2.1 If so stipulated in the Advertisement or Invitation to Bid, or supplementary instructions to bidders, each Bid shall be accompanied by a bid security in the form and amount required, pledging that the Bidder will enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Subparagraph 6.2.1.

4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.

4.3 SUBMISSION OF BIDS

4.3.1 All copies of the Bid, the bid security, if any, and other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

4.3.3 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

4.3.4 Oral, telephonic or telegraphic Bids are invalid and will not receive consideration.

4.4 MODIFICATION OR WITHDRAWAL OF BID

4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time

and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

4.4.2 Prior to the time and date designated for receipt of Bids, a 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 telegram; 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. A change shall be so worded as not to reveal the amount of the original Bid.

4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as modified or resubmitted.

ARTICLE 5

CONSIDERATION OF BIDS

5.1 OPENING OF BIDS

5.1.1 Unless stated otherwise in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be opened publicly and will be read aloud. An abstract of the Bids will be made available to Bidders. When it has been stated that Bids will be opened privately, an abstract of the same information may, at the discretion of the Owner, be made available to the Bidders within a reasonable time.

5.2 REJECTION OF BIDS

5.2.1 The Owner shall have the right to reject any or all Bids, reject a Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or reject a Bid which is in any way incomplete or irregular.

5.3 ACCEPTANCE OF BID (AWARD)

5.3.1 It is the intent of the Owner to award a Contract to the lowest responsible Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities or irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6

POST-BID INFORMATION

6.1 CONTRACTOR'S QUALIFICATION STATEMENT

6.1.1 Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously

required and submitted as a prerequisite to the issuance of Bidding Documents.

6.2 OWNER'S FINANCIAL CAPABILITY

6.2.1 The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

6.3 SUBMITTALS

6.3.1 The Bidder shall, as soon as practicable after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

- .1** a designation of the Work to be performed with the Bidder's own forces;
- .2** names of the manufacturers, products and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
- .3** names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

6.3.3 Prior to the award of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid, or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7

PERFORMANCE BOND AND PAYMENT BOND

7.1 BOND REQUIREMENTS

7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the

furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

7.2 TIME OF DELIVERY AND FORM OF BONDS

7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Subparagraph 7.2.1.

7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

7.2.3 The bonds shall be dated on or after the date of the Contract.

7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 8

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

8.1 FORM TO BE USED

8.1.1 Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

SECTION 00 300-G

BID PROPOSAL FORM

TO: J. Alvin Wilbanks, CEO/Superintendent
Gwinnett County Board of Education
Department of Education Building
437 Old Peachtree Road, NW
Suwanee, GA 30024-2978

Date: December 7, 2010

GENERAL CONTRACTOR _____

State of Georgia GC License Number _____

Gentlemen:

Having carefully examined the Contract Forms, General Conditions, Supplementary Conditions, Drawings, and the Project Manual, all entitled Maxwell High School - Phase 3D - Main Building Renovation, dated November 9, 2010 and Addendum(a) No.(s) _____ and Clarification(s) No.(s) _____, and having examined the site and conditions affecting the work, including availability of materials and labor, the undersigned hereby proposes to start construction within ten (10) days of Notice to Proceed and to furnish all materials, labor, tools, equipment, machinery, transportation, supervision, administration and services necessary and incidental to construct and substantially complete the work called for by the documents in accordance with said documents and within the time set forth therein. All construction must be substantially complete by July 15, 2011. See Phasing Schedule for additional information.

I. BASE BID:

- A. Base Bid Without Allowances: \$ _____ Dollars)
(\$ _____ Dollars)
- B. Total Allowances, Listed in Paragraph "II" Below: \$ _____ Dollars)
(\$ _____ Dollars)
- C. TOTAL BASE BID INCLUDING ALLOWANCES
(SUM OF ITEMS A & B ABOVE) \$ _____ Dollars)
(\$ _____ Dollars)

II. ALLOWANCES IN BASE BID:

- A. The undersigned bidder must submit with this proposal allowance unit prices for allowance quantities specified as part of the base bid. The following allowance unit prices are amounts to be used for work that will be added to or deleted from the Contract by Change Order in the event such additional work may be required. Allowance unit prices are

complete for labor, equipment, material, the hauling in of needed material, and the hauling off and disposal of excess and unsuitable material, installation, acceptable taxes, overhead and profit, and all other incidental costs. OWNER reserves the right to accept or reject these unit prices or require the Work to be performed on a time and material basis with complete daily breakdowns and logs submitted. Applicable allowance unit prices may be equitably adjusted by the Architect if the quantities originally contemplated are so altered in a proposed Change Order that application of the agreed unit prices to the quantity of work proposed will cause substantial inequity to the Owner or the Contractor.

- B. The Base Bids for this project shall include the total cost of items listed below as defined by the Contract Documents. Should conditions be encountered which required work to be performed beyond that defined in the contract, such work will be performed utilizing unit costs listed below applied to field determined quantities. This form shall be completed in its entirety.
- C. Unit Costs shall be used for changing quantities of work items from those indicated by the Contract Drawings.
- D. Unit prices shall include all labor, materials, overhead, profit, insurance, etc. to cover finished work of several kinds called for.
 - 1. Unit prices shall include required engineering, surveying, and testing.
 - 2. Where applicable unit costs shall include related work activities necessary to complete work.
 - 3. No additional surcharges shall be added to unit prices.
- E. Should changes to the contract quantities be requested, a Change Order will be issued for modified scope based on unit costs contained herein.
- F. Allowances in base bid for additional money shall only be applicable for work required to be performed which is in addition to the original requirements of the Contract Documents based on the recommendations of the geotechnical testing agency relating to concealed/unsuitable materials to be excavated. If quantities specified are not used, Contractor shall provide credit to the Owner at specified unit prices.
- G. When questionable materials are encountered during excavation, the contractor shall notify the Architect and the geotechnical testing agency immediately. A field engineer of the testing agency shall witness the entire removal of the materials in question and shall verify the volume and structural capacity of the materials excavated. If the materials are determined to be unsuitable to be used as structural fill by the testing agency, the General Contractor shall consult the Architect. The Architect shall then direct the Contractor to remove the materials from the site or redistribute the materials on the site in an area to be designated by the Owner. Sequencing of all events relating to work involving unit costs shall be coordinated by the General Contractor.
- H. Failure to comply with these requirements shall result in the Architect making determinations as to fair and reasonable amounts due on such additional work.

I. Unsuitable materials shall be defined as:

1. Substances not capable of being compacted to the density specified,
2. Rock material larger than 1/2 cubic foot in volume,
3. Debris and organic material. Such materials shall be determined by the Owner's Geotechnical Testing Agency;
4. Materials which are not suitable for use on this project;
5. Unsuitability for sale of materials to third parties is not included in this definition.

J. Soil material which is too wet to permit the specified compaction but is still suitable to be used in structural capacity (once dried) based on the recommendations of the soils testing agency, shall be spread and permitted to dry in an area to be designated by the Architect. Contractor shall assist drying by discing, harrowing or pulverizing until the soil moisture content is reduced to the specified value. Only excavation of soil which is wet due to a concealed condition, including, but not limited to, underground springs, high water table and leaking pipes, shall be addressed as a potential additive change order. Suitable materials which are wet due to precipitation as determined by the Owner's Testing Agency shall be dried as specified and reused at no additional cost.

K. Allowances in Base Bid:

1. Excavate materials determined to be unsuitable by the Owner's Testing Agency and remove from the site 100 cubic yards @ \$ /cy
2. Trench rock excavation and removal from the site 50 cubic yards @ \$ /cy
3. Fill and compact with suitable soils acquired off-site to replace unsuitable soils or trench rock removed 150 cubic yards @ \$ /cy
4. Smokestop/block-up existing unforeseen holes in existing walls above ceiling with 5/8" gyp or firestopping material 200 square feet @ \$ /sf
5. Miscellaneous hidden conflicts \$10,000.00

III. UNIT PRICES NOT IN BASE BID:

A. The undersigned bidder agrees to provide additional work, if added, or to delete specified work, if requested, at the unit prices listed unless such prices have been equitably adjusted by the Architect as previously stated. The unit prices include charges for fee, layout, supervision (field, and home office), general expense, taxes, insurance, labor burden overhead and profit.

1. Furnish and install a woven geotextile fabric suitable for heavy duty traffic over earth subgrade in conjunction with stone stabilization \$ /sq. yd.

2. Furnish and install stone stabilization base materials including:
 - a. Graded Aggregate Base \$ /ton
 - b. #57 Gravel \$ /ton
 - c. Crusher Stone \$ /ton
 - d. Granular Bedding \$ /ton
 - e. 50 lb. Rip Rap \$ /ton

3. Furnish and install storm/sanitary sewer cleanout outside of pavement \$ /lf.

4. Furnish and install storm/sanitary sewer cleanout within paved area \$ /lf.

5. Furnish and install pipe materials including:
 - a. 6" Ø Class 50 D.I.P.
 - (1) 4' deep to 8' deep \$ /lf
 - (2) 8' deep to 12' deep \$ /lf
 - b. 4" Ø Schedule 40 PVC
 - (1) 4' deep to 8' deep \$ /lf
 - (2) 8' deep to 12' deep \$ /lf
 - c. 6" Ø Schedule 40 PVC
 - (1) 4' deep to 8' deep \$ /lf
 - (2) 8' deep to 12' deep \$ /lf
 - d. 12" Ø RCP
 - (1) 4' deep to 8' deep \$ /lf
 - (2) 8' deep to 12' deep \$ /lf
 - e. 15" Ø CMP
 - (1) 4' deep to 8' deep \$ /lf.
 - (2) 8' deep to 12' deep \$ /lf.
 - f. 3" Type K copper pipe \$ /lf

* Cost shall include all appurtenances, including fittings, bands, wyes, etc. and all appurtenant details.

6. Furnish and install:
 - a. Pre-cast 48" diameter concrete storm drainage structures \$ /lf.
 - b. 48" diameter brick storm drainage structures \$ /lf.
 - c. Heavy duty cast iron grate and frame \$ /set
 - d. Cast iron ring and cover as per Gwinnett County Department of Public Utilities Standards \$ /set

7. Remove and replace concrete curb & gutter \$ /lf

IV. Notice to Proceed will be issued after the Pre-Construction meeting as soon as all required paper work such as Contracts, Bonds, Insurance, etc. are in order. Contractor shall mobilize within ten (10) days of Notice to Proceed. All construction must be substantially complete by July 15, 2011. See Phasing Schedule for additional information.

V. LIST OF SUBCONTRACTORS:

- A. Plumbing: _____
- B. HVAC : _____
- C. Electrical: _____
- D. Roofing: _____

VI. For and in consideration of the sum of \$1.00, the receipt of which is hereby acknowledged, the undersigned agrees that this proposal may not be revoked or withdrawn after the time set for the opening of bids but shall remain open for acceptance for a period of 60 days following such time. The undersigned, upon receipt of written notice of the acceptance of this bid, agrees to execute within five days a contract (See Section 00 500) for the work for the above stated compensation, and to furnish and deliver to Owner at the same time as the Contract the required Performance Bonds and a Labor and Materials Payment Bonds, for General Contractor and from the Mechanical/HVAC, Plumbing, Electrical, Fire Protection, Steel Erection and Roofing Subcontractors in amount to equal 100% of the Contract Sums. These bonds shall be written on forms provided by a company acceptable to the Owner and licensed to do business in the State of Georgia at the time the bonds are written, and that is listed on "Department of the Treasury Circular 570."

VII. If this proposal is accepted within 60 days after the date set for the opening of bids and the undersigned fails to execute the Contract within five days after written notice of such acceptance or if he fails to furnish the Performance Bonds and the Labor and Material Payment Bonds, the obligation of the Bid Bond will remain in full force and effect and the money payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure; otherwise, said Bid Bond shall be returned to the undersigned upon completion of such obligations.

IV. Notice to Proceed will be issued after the Pre-Construction meeting as soon as all required paper work such as Contracts, Bonds, Insurance, etc. are in order. Contractor shall mobilize within ten (10) days of Notice to Proceed. All construction must be substantially complete by July 15, 2011. See Phasing Schedule for additional information.

V. LIST OF SUBCONTRACTORS:

- A. Plumbing: _____
- B. HVAC : _____
- C. Electrical: _____
- D. Roofing: _____

VI. For and in consideration of the sum of \$1.00, the receipt of which is hereby acknowledged, the undersigned agrees that this proposal may not be revoked or withdrawn after the time set for the opening of bids but shall remain open for acceptance for a period of 60 days following such time. The undersigned, upon receipt of written notice of the acceptance of this bid, agrees to execute within five days a contract (See Section 00 500) for the work for the above stated compensation, and to furnish and deliver to Owner at the same time as the Contract the required Performance Bonds and a Labor and Materials Payment Bonds, for General Contractor and from the Mechanical/HVAC, Plumbing, Electrical, Fire Protection, Steel Erection and Roofing Subcontractors in amount to equal 100% of the Contract Sums. These bonds shall be written on forms provided by a company acceptable to the Owner and licensed to do business in the State of Georgia at the time the bonds are written, and that is listed on "Department of the Treasury Circular 570."

VII. If this proposal is accepted within 60 days after the date set for the opening of bids and the undersigned fails to execute the Contract within five days after written notice of such acceptance or if he fails to furnish the Performance Bonds and the Labor and Material Payment Bonds, the obligation of the Bid Bond will remain in full force and effect and the money payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure; otherwise, said Bid Bond shall be returned to the undersigned upon completion of such obligations.

The undersigned has checked carefully all the foregoing figures and understands that the Owner will not be responsible for any errors or omissions on the part of the undersigned in making this bid.

BY: _____
(PRINT NAME & SIGN)

TITLE: _____

COMPANY: _____

ADDRESS: _____

WITNESS: _____ COMPANY SEAL: _____

* The Attorney-in-fact must file with Bid Bond a certified copy of his Power-of-Attorney to sign such bond.

County of _____ State of _____ personally before me, the undersigned authority, appeared _____, who is known to me to be an official of the firm of _____. Who, after being duly sworn, stated on his oath that he had read the above and that the same is true and correct.

Notary Public My Commission Expires: _____

SECTION 00 500-G

CONTRACT

I. PART 1 - GENERAL

- 1.1 The Standard Form of Agreement Between Owner and Contractor and Attachment "A", with modifications as executed by the parties, is hereby made a part of these documents to the same extent as if herein written out in full. Agreement shall be signed by an officer of the company, notarized and shall be stamped and crimped with the general contractor's company seal.

GWINNETT COUNTY BOARD OF EDUCATION
437 Old Peachtree Road, Suwanee, Georgia 30024



STANDARD FORM OF AGREEMENT BETWEEN
OWNER AND CONTRACTOR

AGREEMENT

made as of this ____ day of ____ in the year of Two Thousand ____.

BETWEEN

The Owner:

GWINNETT COUNTY BOARD OF EDUCATION
437 Old Peachtree Road, NW
Suwanee, Georgia 30024

and the Contractor:

(Name and address)

The Project is:

MAXWELL-HIGH SCHOOL
PHASE 3D-MAIN BUILDING RENOVATION
990 McElvaney Lane, NW
Lawrenceville, GA 30044

(Name and location)

The Architect is:

LINDSAY POPE BRAYFIELD CLIFFORD & ASSOC., INC.
344 West Pike Street
Lawrenceville, GA 30046

(Name and address)

The Owner and Contractor agree as set forth below.

ARTICLE 1
THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, the current edition of the General Conditions of the Contract dated August 30, 2002, Exhibit "A" Attachment (General, Supplementary, and other Conditions), Drawings, Specifications, addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement; these form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 9.

ARTICLE 2
THE WORK OF THIS CONTRACT

The Contractor shall execute the entire Work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others, or as follows:

ARTICLE 3
DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

- 3.1 The date of commencement is the date from which the Contract Time of Paragraph 3.2 is measured, and shall be the date of this Agreement, as first written above, unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

(Insert the date of commencement, if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

The Date of Commencement will be stipulated by the Notice to Proceed

Unless the date of commencement is established by a notice to proceed issued by the Owner, the Contractor shall notify the Owner in writing not less than five days before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

- 3.2 The Contractor shall achieve Substantial Completion of the entire Work not later than
(Insert the calendar date or number of calendar days after the date of commencement. Also insert any requirements for earlier Substantial Completion of certain portions of the Work, if not stated elsewhere in the Contract Documents.)

subject to adjustments of this Contract Time as provided in the Contract Documents.

ARTICLE 4
CONTRACT SUM

4.1 The Owner shall pay the Contractor in current funds for the Contractor's performance of the Contract the Contract Sum of _____ Dollars (\$ _____), subject to additions and deductions as provided in the Contract Documents.

4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

(State the numbers or other identification of accepted alternates. If decisions on other alternates are to be made by the Owner subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date until which that amount is valid.)

4.3 Unit prices, if any, are as follows:

ARTICLE 5
PROGRESS PAYMENTS

5.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

5.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

Request for payment must be received by the Architect on or before the first day of the month. The architect will approve and send to the Owner's office by the eighth day of the same month in order for the Owner to make payment on the first Friday following the fifteenth of the same month. It shall be understood that if the Contractor's actual progress becomes more than ten percent (10%) behind the Contractor's anticipated progress, the Owner may direct the withholding of payments to the Contractor in an amount equal to the percent behind Contractor's anticipated progress, in addition to the normal 10% withheld.

5.3 Each Application for Payment shall be based upon the schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work and be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

- 5.4** Applications for Payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.
- 5.5** Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
- 5.5.1** Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of ten percent (10%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute may be included as provided in Subparagraph 7.3.7 of the General Conditions even though the Contract Sum has not yet been adjusted by the Change Order;
- 5.5.2** Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of ten percent (10%);
- 5.5.3** Subtract the aggregate of previous payments made by the Owner; and
- 5.5.4** Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Paragraph 9.5 of the General Conditions.
- 5.6** The progress payment amount determined in accordance with Paragraph 5.5 shall be further modified under the following circumstances:
- 5.6.1** Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, and additional amounts payable in accordance with Subparagraph 9.10.3 of the General Conditions.
- 5.7** Reduction or limitation of retainage, if any, shall be as follows:
(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Subparagraphs 5.5.1 and 5.5.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

As provided by Code Section 13-10-80, as reproduced in Exhibit "A".

ARTICLE 6
FINAL PAYMENT

Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when (1) the Contract has been fully performed by the Contractor except for the Contractor's responsibility to correct nonconforming Work as provided in Subparagraph 12.2.2 of the General Conditions and to satisfy other requirements, if any, which necessarily survive final payment; and (2) a final Certificate for Payment has been issued by the Architect; such final payment shall be made by the Owner not more than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

ARTICLE 7
MISCELLANEOUS PROVISIONS

- 7.1 Where reference is made in this Agreement to a provision of the General Conditions or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.
- 7.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

(Usury laws and requirements under the Federal Truth in Lending Act, similar state and local consumer credit laws and other regulations at the Owner's and Contractor's principal places of business, the location of the Project and elsewhere may affect the validity of this provision. Legal advice should be obtained with respect to deletions or modifications, and also regarding requirements such as written disclosures or waivers.)

- 7.3 Other provisions:

ARTICLE 8
TERMINATION OR SUSPENSION

- 8.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of the General Conditions.
- 8.2 The Work may be suspended by the Owner as provided in Article 2.3 of the General Conditions.

ARTICLE 9
ENUMERATION OF CONTRACT DOCUMENTS

9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated as follows:

9.1.1 The Agreement, Articles 1 thru 9 (pages 1 thru 7). Standard Form of Agreement Between Owner and Contractor.

9.1.2 The General Conditions Articles 1 thru 16, pages 1 thru 40.

9.1.3 The Supplementary and other Conditions of the Contract are those contained in the Project Manual dated _____, and are as follows:

Document	Title	Pages
----------	-------	-------

9.1.4 The Specifications are those contained in the Project Manual dated as in Subparagraph 9.1.3, and are as follows:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

Section	Title	Pages
---------	-------	-------

9.1.5 The Drawings are as follows, and are dated _____ unless a different date is shown below:
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

Number	Title	Date
--------	-------	------

9.1.6 The addenda, if any, are as follows:

Number	Date	Pages
--------	------	-------

Portions of addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

9.1.7 Other documents, if any, forming part of the Contract Documents are as follows:
(List here any additional documents which are intended to form part of the Contract Documents. The General Conditions provide that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above and is executed in at least three original copies of which one is to be delivered to the Contractor, one to the Architect for use in the administration of the Contract, and the remainder to the Owner.

OWNER

CONTRACTOR

(SEAL)

GWINNETT COUNTY BOARD OF EDUCATION

(Name of Contractor)

By: _____
(Signature)

By: _____
(Signature)

J. Alvin Wilbanks, CEO/Superintendent
(Printed Name and Title)

(Printed Name and Title)



CAUTION: You should sign an original document which has this caution printed in red.

**ATTACHMENT
EXHIBIT "A"
TO STANDARD FORM OF AGREEMENT BETWEEN
OWNER AND CONTRACTOR**

Section 1. Article 1 of Chapter 10 of Title 13 of the Official Code of Georgia Annotated, relating to general conditions affecting contracts for public works, is amended by adding at the end of said article a new Code section, to be designated as Code Section 13-10-2, to read as follows:

13-10-2

- (a) As used in this Code section, the term:
- (1) "Contractor" means a person having a direct contract with the Owner.
 - (2) "Lower tier subcontractor" means a person other than a contractor having a direct Contract with a subcontractor.
 - (3) "Owner" means the state, any county, municipal corporation, authority, board of education, or other public board, public body, department, agency instrumentality, or political subdivision of the state.
 - (4) "Owner's authorized contract representative" means the architect or engineer in charge of the project for the Owner or such other contract representative or Officer as designated in the contract documents as the party representing the Owner's interest regarding administration and oversight of the project.
 - (5) "Subcontractor" means a person other than an Owner having a direct contract with the Contractor.
- (b) In any contract for the performance of any construction project entered into on or after July 1, 1985, with an Owner, as defined in paragraph (3) of subsection (a) of this Code section. Such contract shall provide for the following:

After work has commenced at the construction site, progress payments to be made on some periodic basis, and at least monthly, based on the value of work completed as may be provided in the contract documents plus the value of materials and equipment suitably stored, insured, and protected at the construction site, and at the Owner's discretion such materials and equipment suitably stored, insured, and protected off site at a location approved by the Owner's authorized Contract representative when allowed by the contract documents, less retainage: and

- (2) (A) Retainage to a maximum of 10 percent of each progress payment; provided, however, that when 50 percent of the contract value including change orders and other additions to the contract value provided for by the contract documents is due and the manner of completion of the contract work and its progress are reasonably satisfactory to the Owner's authorized contract representative, the Owner shall withhold no more retainage. At the discretion of the Owner and with the approval of the contractor, the retainage of each subcontractor may be released separately as the subcontractor completes his work.

(B) If, after discontinuing the retention, the Owner's authorized contract representative determines that the work is unsatisfactory or has fallen behind schedule, retention may be resumed at the previous level. If retention is resumed by an Owner, the contractor and subcontractors shall be entitled to resume withholding retainage accordingly.

(C) At substantial completion of the work or such other standard of completion as may be provided in the contract documents and as the Owner's authorized contract representative determines the work to be reasonably satisfactory, the Owner shall within 30 days after invoice and other appropriate documentation as may be required by the contract documents are provided pay the retainage to the contractor. If at that time there are any remaining incomplete minor items, an amount equal to 200 percent of the value of each item as determined by the Owner's authorized contract representative shall be withheld until such item or items are completed. The reduced retainage shall be shared by the contractor and subcontractors as their interests may appear.

(D) The contractor shall, within ten days from the contractor's receipt of retainage from the Owner, pass through payments to subcontractors and shall reduce each subcontractor's retainage in the same manner as the contractor's retainage is reduced by the Owner, provided that the value of each subcontractor's work complete and in place equals 50 percent of his subcontract value, including approved change orders and other additions to the subcontract value and provided, further, that the work of the subcontractor is proceeding satisfactorily and the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the contractor in his reasonable discretion may require, including, but not limited to, a payment and performance bond.

(E) The subcontractor shall, within ten days from the subcontractor's receipt of retainage from the contractor, pass through payments to lower tier subcontractors and shall reduce each lower tier subcontractor's retainage reduced by the contractor, provided that the value of each lower tier subcontractor's work complete and in place equals 50 percent of this subcontract value, including approved change orders and other additions to the subcontract value and provided, further, that the work of the lower tier subcontractor is proceeding satisfactorily and the lower tier subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his work including any warranty work as the subcontractor in his reasonable discretion may require, including, but not limited to, a payment and performance bond.

(c) This Code section shall not apply to:

(1) Any contracts let by the Department of Transportation of this state for the construction, improvement, or maintenance of roads or highways in this state or purposes incidental thereto: or

(2) Any contracts whose value or duration at the time of the award does not exceed \$150,000.00 or 45 days in duration.

- (d) Contract and subcontract provisions inconsistent with the benefits extended to contractors, subcontractors, and lower tier subcontractors by this Code section shall be unenforceable; provided, however, that nothing in this Code section shall render unenforceable any contract or subcontract provisions allowing greater benefits to be extended to such contractors, subcontractors, or lower tier subcontractors, the provisions and benefits of this Code section being minimal only.
- (e) Nothing shall preclude a payer under this Code section, prior to making a payment, from requiring the payee to submit satisfactory evidence, including but not limited to all and/or any invoices, that all payrolls, material bills, and other indebtedness connected with the work have been paid.

In addition to the foregoing, before the Owner can implement the above amendment to the contract, a letter of consent from the Surety Company must be provided to the Owner ten (10) days prior to the contractor's request to the Owner to withhold no more retainage under the terms of Exhibit "A".

END OF EXHIBIT "A"

SECTION 00 600-G

BONDS AND CERTIFICATES

I. PART 1 - GENERAL

- 1.1 **AFFIDAVIT FOR BIDDING:** Complete three (3) copies, notarized, and submit to Owner within ten (10) days of award of Contract.
- 1.2 **PAYMENT & PERFORMANCE BOND:** General Contractor and Mechanical/HVAC, Plumbing, Electrical and Roofing Subcontractors shall furnish both a Performance Bond and Payment Bond, each in the amount of 100% of the Contract Sum, unless otherwise directed by the Owner. The surety must be one which is authorized to do business in the State of Georgia and is listed on "Department of the Treasury Circular 570". In addition, company furnishing bonds shall have an A.M. Best Company rating of at least a Class "A" with a financial size of VI or better. Bonds must be accompanied by letter stating company's current rating for verification prior to acceptance by the Owner and execution of the formal contract agreement. It shall be specifically understood that the Performance Bond fully protects the Owner and guarantees the completion of the project in accordance with all Bid Documents. After award of Contract, submit a properly executed "Performance Bond" and "Labor and Material Payment Bond" on attached forms. Submit original and two copies no later than Pre-Construction Conference. Subcontractor bonds must be submitted within two weeks of Notice to Proceed.
- 1.3 **CONTRACTOR'S QUALIFICATION STATEMENT:** All bidders shall submit a properly executed "Contractor's Qualification Statement", AIA Document A305, dated 1986 which is hereby made a part of these documents. Submit email or hard copy to Architect prior to issuance of Bid Documents.
- 1.4 **BID BOND:** A bid bond in the amount of 5% of the base bid shall accompany the bid on AIA Document 310. The Attorney in-fact who signs the bid bond must file with the bid bond a certified copy of his Power of Attorney to sign such bond. Submit original and two copies.
- 1.5 **CERTIFICATE OF INSURANCE:** After award of contract, submit a properly executed "Certificate of Insurance", AIA Document G705, which is hereby made a part of these documents. Submit original and two copies no later than Pre-Construction Conference.
- 1.6 **LIST OF SUBCONTRACTORS:** After award of contract, but prior to Pre-Construction Conference, submit a properly executed "List of Subcontractors" AIA Document G805, which is hereby made a part of these documents. Submit three copies.
- 1.7 **BID PROPOSAL:** Submit original and two copies.

AFFIDAVIT FOR BIDDING

(This form to be executed in compliance with Official Code of Georgia Annotated Section 36-91-21(3). If the Contractor is a partnership, the Affidavit shall be executed by all of the partners and any officer, agent, or other person who may have represented or acted for them in bidding for or procuring the contract. If the Contractor is a corporation, all officers, agents, or other persons who may have acted for or represented the corporation in bidding for or procuring the Contract shall execute the Affidavit.)

STATE OF GEORGIA
COUNTY OF _____

_____, being duly sworn, hereby deposes and says that he/she has read, and is familiar with the provisions of the Official Code of Georgia Annotated Section 36-91-21(d) which provide as follows:

- (d) Whenever a public works construction contract for any governmental entity subject to the requirements of this chapter is to be let out by competitive sealed bid or proposal, no person, by himself or herself or otherwise, shall prevent or attempt to prevent competition in such bidding or proposals by any means whatever. No person who desires to procure such work for himself or herself or for another shall prevent or endeavor to prevent anyone from making a bid or proposal therefor by any means whatever, nor shall such person so desiring the work cause or induce another to withdraw a bid or proposal for the work.

and that he/she has not directly or indirectly violated said provisions of the law.

Further, Affiant saith not.

This _____ day of _____, 20_____.

Sworn to and subscribed before me this _____ of _____, 20_____.

Notary Public

PAYMENT BOND (Contractor)

_____, a corporation duly
[Insert Proper Name of Surety]

organized and existing under the laws of the State of _____, as surety ("Surety"), and

_____, as principal ("Contractor"), enter
[Insert Proper Name of Contractor]

into, execute this bond ("Payment Bond"), and bind themselves in favor of the Gwinnett County Board of Education, as obligee ("Owner") in the penal sum of

_____ dollars (\$ _____), as of _____
[Insert Penal Sum in words and numerals] *[Insert Date of Construction Contract]*

WHEREAS, the Contractor has executed a contract with the Owner of even date herewith ("Construction Contract") for construction of:

[Insert Description and Location of the Project]

("Project"); and,

WHEREAS, the Owner has required the Contractor to furnish this Payment Bond containing the terms and conditions set forth herein as a condition to executing the Construction Contract with the Contractor;

NOW THEREFORE, the Surety and the Contractor, both jointly and severally, and for themselves, their heirs, administrators, executors and successors agree:

1.

The Construction Contract is hereby incorporated herein and by reference made a part hereof to the same extent and effect as though it were copied verbatim herein. The Surety and the Contractor are bound for the full performance of the Construction Contract including without exception all of its terms and conditions, both express and implied, and, without limitation, specifically including Contractor's obligation to pay for labor, materials, machinery, and equipment provided in connection with the Construction Contract performance.

2.

For purposes of this Payment Bond, Beneficiary is defined as any subcontractor or other person supplying labor, materials, machinery, or equipment in the prosecution of the work provided for in the Construction Contract, or any other person entitled to the protection of this Payment Bond pursuant to the provisions of Title 36, Chapter 91, Official Code of Georgia Annotated.

3.

Every Beneficiary who has not been paid in full for labor or material furnished in the prosecution of the work on the Project before the expiration of a period of ninety (90) days after the day on which the last of the labor was done or performed by such person or the material or equipment or machinery was furnished or supplied by such person for which such claim is made, or when he or she has completed his or her subcontract for which claim is made, shall have the right to bring an action on this Payment Bond for the amount, or the balance thereof, unpaid at the time of the commencement of such action and to prosecute such action to final execution and judgment for the sum or sums due such person; provided, however, that:

(A) Any person having a direct contractual relationship with a subcontractor but no contractual relationship, express or implied, with the Contractor where the Contractor has not complied with the notice of commencement requirements in accordance with Code Section 36-91-92, Official Code of Georgia Annotated, shall have the right of action upon this Payment Bond upon giving written notice to the Contractor within ninety (90) days from the day on which such person did or performed the last of the labor or furnished the last of the material or machinery or equipment for which such claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the material was furnished or supplied or for whom the labor was performed or done; provided, however, that: (i) the Contractor's failure to supply a copy of the notice of commencement within ten calendar days of receipt of a written request from a subcontractor, materialman or person shall render the provisions of this paragraph 3(A) inapplicable to such subcontractor, materialman or person, and (ii) the Contractor's failure to file a notice of commencement shall render the notice to contractor requirements of this paragraph 3(A) inapplicable.

(B) Any person having direct contractual relationship with a subcontractor but no contractual relationship express or implied with the Contractor where the Contractor has complied with the notice of commencement requirements in accordance with subsection (a) of Code Section 36-91-92, Official Code of Georgia Annotated, shall have the right of action on this Payment Bond provided such person shall, within thirty (30) days from the filing of the notice of commencement or thirty (30) days following the first delivery of labor, material, machinery or equipment, whichever is later, give to the Contractor a written notice setting forth:

- (i) The name, address and telephone number of the person providing labor, material, machinery or equipment;
- (ii) The name and address of each person at whose instance the labor, material, machinery or equipment is being furnished;
- (iii) The name and the location of the Project; and
- (iv) A description of the labor, material, machinery or equipment being provided and, if known, the contract price or anticipated value of the labor, material, machinery or equipment to be provided or the amount claimed to be due, if any; and

(C) Nothing contained in this Payment Bond shall limit the right of action of a Beneficiary to the ninety (90) day period referenced in paragraph 3(A) above.

The notice required under paragraph 3(A) of this Payment Bond may be served by registered or certified mail, postage prepaid, or statutory overnight delivery, duly addressed to the Contractor, at any place at which the Contractor maintains an office or conducts his or her business or at his or her residence, by depositing such notice in any post office or branch post office or any letter box under the control of the United States Postal Service; alternatively, notice may be served in any manner in which the sheriffs of the State of Georgia are authorized by law to serve summons or process.

Every action instituted on this Payment Bond shall be brought in the name of the Beneficiary, without the Owner being made a party thereto.

4.

In no event shall the Surety be obligated hereunder for sums in excess of the Penal Sum. As used in this Payment Bond, the term "Penal Sum" means the amount stated as the penal sum in the preamble of this Payment Bond, as that amount may be adjusted from time to time pursuant to paragraph 5 below.

5.

The Surety waives notice of any changes to the Construction Contract including, without limitation, changes in the contract time, the contract price, or the work to be performed. If the total amount payable by the terms of the Construction Contract is increased to an amount in excess of the then current Penal Sum, then, automatically and without notice to or any action required of any party, the Penal Sum shall be increased as the total amount payable by the terms of the Construction Contract is increased. No agreement, modification, or change in the Construction Contract, change in the work covered by the Construction Contract, or extension of time for the completion of the Construction Contract shall release the Surety of this Payment Bond.

6.

No action can be instituted hereunder after one (1) year from the completion of the Construction Contract and the acceptance of the Project by the Owner and any other applicable public authorities.

7.

Unless otherwise provided herein, any and all notices to the Surety or the Contractor shall be given by Certified Mail, Return Receipt Requested, to the address set forth for each party below, including a courtesy copy to the Owner:

Surety: _____

Attn: _____

Contractor: _____

Attn: _____

Owner: Gwinnett County Board of Education

Attn: _____

8.

Notwithstanding any provision herein that may be to the contrary, this Payment Bond is intended to be a statutory payment bond under applicable laws of the State of Georgia and shall be so construed.

CONTRACTOR:

SURETY:

_____[SEAL]
[Typed Name]

_____[SEAL]
[Typed Name]

By: _____
[Signature]

By: _____
[Signature]

[Printed Name, Title and Address]

[Printed Name, Title and Address]

PERFORMANCE BOND (Contractor)

_____, a corporation duly
[Insert Proper Name of Surety]

organized and existing under the laws of the State of _____, as surety ("Surety"), and

_____, as principal
[Insert Proper Name of Contractor]

("Contractor"), enter into, execute this bond ("Performance Bond"), and bind themselves in favor of the Gwinnett County Board of Education as obligee ("Owner"), in the penal sum of

_____ dollars (\$ _____), as of _____
[Insert Penal Sum in words and numerals] *[Insert Date of Construction Contract]*

WHEREAS, the Contractor has executed a contract with the Owner of even date herewith

("Construction Contract") for construction of:

[Insert Description and Location of the Project]

("Project"); and

WHEREAS, the Owner has required the Contractor to furnish this Performance Bond containing the terms and conditions set forth herein as a condition to executing the Construction Contract with the Contractor;

NOW THEREFORE, the Surety and the Contractor, both jointly and severally, and for themselves, their heirs, administrators, executors and successors agree:

1.

The Construction Contract is hereby incorporated herein and by reference made a part hereof to the same extent and effect as though it were copied verbatim herein. The Surety and the Contractor are bound for the full performance of the Construction Contract, including, without exception, all of its terms and conditions, both express and implied.

2.

If the Contractor is in default of the Construction Contract and the Owner, by written notice to the Contractor and the Surety, declares the Contractor to be in default and terminates the right of the Contractor to proceed, the Surety shall thereupon promptly notify the Owner in writing as to which of the actions permitted to the Surety in Paragraph 3 it will take.

3.

Upon default and termination of the Contractor and notice to the Contractor and Surety as provided in Paragraph 2 above, the Surety shall, within 30 days, proceed to take one or, at its option, more than one of the following courses of action:

(A) Proceed itself, or through others acting on its behalf, to complete full performance of the Construction Contract including, without limitation, correction of defective and nonconforming work performed by or on behalf of the Contractor. During such performance by the Surety, the Owner shall pay the Surety from its own funds only such sums as would have been due and payable to the Contractor in the absence of the default and termination.

(B) Applicable law permitting, and with the prior written consent of the Owner, obtain bids or proposals from contractors previously identified as being acceptable to the Owner, for full performance of the Construction Contract. The Surety shall furnish the Owner a copy of such bids or proposals upon receipt of same. The Surety shall promptly select, with the agreement of the Owner, the best responsive bid or proposal and shall promptly tender the contractor submitting it, together with a contract for fulfillment and completion of the Construction Contract executed by the completing contractor, to the Owner for the Owner's execution. Upon execution by the Owner of the contract for fulfillment and completion of the Construction Contract, the completing contractor shall furnish to the Owner a performance bond and a separate payment bond, each in the form of those bonds previously furnished to the Owner for the Project by the Contractor. Each such bond shall be in the penal sum of the (1) fixed price for completion, (2) guaranteed maximum price for completion, or (3) estimated price for completion, whichever is applicable. The Owner shall pay the completing contractor from its own funds only such sums as would have been due and payable to the Contractor under the Construction Contract as and when they would have been due and payable to the Contractor in the absence of the default and termination. To the extent that the Owner is obligated to pay the completing contractor sums which would not have then been due and payable to the Contractor under the Construction Contract, the Surety shall provide the Owner with such sums in a sufficiently timely manner that the Owner can utilize such sums in making timely payment to the completing contractor; or,

(C) Take any and all other acts, if any, mutually agreed upon in writing by the Owner and the Surety.

4.

In addition to those duties set forth hereinabove, the Surety shall promptly pay the Owner all loss, costs and expenses resulting from the Contractor's default(s), including, without limitation, fees, expenses and costs for architects, engineers, consultants, testing, surveying and attorneys, liquidated or actual damages, as applicable, for delay in completion of the Project, and fees, expenses and costs incurred at the direction, request, or as a result of the acts or omissions of the Surety.

5.

In no event shall the Surety be obligated to the Owner hereunder for any sum in excess of the Penal Sum. As used in this Performance Bond, the term "Penal Sum" means the amount stated as the penal sum in the preamble of this Performance Bond, as that amount may be adjusted from time to time pursuant to Paragraph 6 below.

6.

The Surety waives notice of any changes to the Construction Contract including, without limitation, changes in the contract time, the contract price, or the work to be performed. If the total amount payable by the terms of the Construction Contract is increased to an amount in excess of the then current Penal Sum, then, automatically and without notice to or any action required of any party, the Penal Sum shall be increased as the total amount payable by the terms of the Construction Contract is increased.

7.

This Performance Bond is provided by the Surety for the sole and exclusive benefit of the Owner, together with its successors or assigns. No other party, person or entity shall have any rights against the Surety hereunder.

8.

Any and all notices to the Surety, the Contractor or the Owner shall be given by Certified Mail, Return Receipt Requested, to the address set forth for each party below:

Surety:

Attn: _____

Contractor:

Attn: _____

Owner:

Gwinnett County Board of Education

Attn: _____

9.

Any statutory limitation, which may be contractually superseded, to the contrary notwithstanding, any action hereon may be instituted so long as the applicable statute of limitations governing the Construction Contract has not run or expired.

CONTRACTOR:

SURETY:

_____ [SEAL]
[Typed Name]

_____ [SEAL]
[Typed Name]

By: _____
[Signature]

By: _____
[Signature]

[Printed Name, Title and Address]

[Printed Name, Title and Address]



AIA Document A305

Contractor's Qualification Statement

1986 EDITION

This form is approved and recommended by The American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by the AIA or AGC.

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO:

ADDRESS:

SUBMITTED BY:

NAME:

ADDRESS:

PRINCIPAL OFFICE:

Corporation

Partnership

Individual

Joint Venture

Other

NAME OF PROJECT (if applicable):

TYPE OF WORK (file separate form for each Classification of Work):

_____ General Construction

_____ HVAC

_____ Plumbing

_____ Electrical

_____ Other _____

(please specify)

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1.6 If the form of your organization is other than those listed above, describe it and name the principals:

2. LICENSING

2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

2.2 List jurisdictions in which your organization's partnership or trade name is filed.

3. EXPERIENCE

3.1 List the categories of work that your organization normally performs with its own forces.

3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

3.2.1 Has your organization ever failed to complete any work awarded to it?

3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

3.4.1 State total worth of work in progress and under contract:

3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

3.5.1 State average annual amount of construction work performed during the past five years:

3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

4. REFERENCES

4.1 Trade References:

4.2 Bank References:

4.3 Surety:

4.3.1 Name of bonding company:

4.3.2 Name and address of agent:

5. FINANCING

5.1 Financial Statement.

- 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

- 5.1.2 Name and address of firm preparing attached financial statement, and date thereof.

- 5.1.3 Is the attached financial statement for the identical organization named on page one?

- 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

- 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

6. SIGNATURE

6.1 Dated at _____ this _____ day of _____ 19____

Name of Organization:

By:

Title:

6.2

M _____ being
duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be
misleading.

Subscribed and sworn before me this _____ day of _____ 19____

Notary Public:

My Commission Expires:



CAUTION: You should use an original AIA document which has this caution printed in red. An original assures that changes will not be obscured as may occur when documents are reproduced.

THE AMERICAN INSTITUTE OF ARCHITECTS



AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we _____
(Here insert full name and address or legal title of Contractor)

as Principal, hereinafter called the Principal, and _____
(Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of _____
as Surety, hereinafter called the Surety, are held and firmly bound unto _____
(Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called the Obligee, in the sum of

_____ Dollars (\$ _____),
for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind
ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by
these presents.

WHEREAS, the Principal has submitted a bid for _____
(Here insert full name, address and description of project)

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 Contract and 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.

Signed and sealed this _____ day of _____ 19____

(Witness) { _____
(Principal) (Seal)

(Title)

(Witness) { _____
(Surety) (Seal)

(Title)

GWINNETT COUNTY BOARD OF EDUCATION**ARTICLE 1**
GENERAL CONDITIONS**1.1 BASIC DEFINITIONS****1.1.1 THE CONTRACT DOCUMENTS**

The Contract Documents consists of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, instructions to Bidders, sample forms, the Contractor's bid or portions of addenda relating to bidding requirements).

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the Owner and a Subcontractor or Sub-Subcontractor, or (2) between any persons or entities other than the Owner and Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and wherever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

1.1.7 THE PROJECT MANUAL

The Project Manual is the volume usually assembled for the Work, which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 The Contract Documents shall be signed by the Owner and Contractor as provided in the Agreement. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request.

1.2.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

1.2.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contractor Documents are complementary, and what is required by 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.

1.2.4 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

1.2.5 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

ARTICLE 2
OWNER

2.1 DEFINITION

2.1.1 The Owner is the Gwinnett County Board of Education. The term "Owner" means the Owner or the Owner's authorized representative.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project and a legal description of the site.

2.2.2 Except for permits and fees which are the responsibility of the Contractor under the Contract Documents, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

2.2.3 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in orderly progress of the Work.

2.2.4 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, twenty copies of Drawings and Project Manuals.

2.2.5 The foregoing is in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Article 6 (Construction by Owner or by Separate Contractors), Article 9 (Payments and Completion) and Article 11 (Insurance and Bonds).

2.3 OWNER'S RIGHTS TO STOP THE WORK

2.3.1 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Paragraph 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owner, by written order signed personally or by an agent specifically so empowered by the Owner in writing may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise the right for the benefit of the Contractor or any other entity, except to the extent required by Subparagraph 6.1.3.

2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a forty-eight hour period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such forty-eight hour period give the Contractor a second written notice to correct such deficiencies within a second forty-eight

hour period. If the Contractor within such second forty-eight hour period after receipt of such second notice fails to commence and continue to correct any deficiencies, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Construction Change Directive shall be issued deducting from payments then or thereafter due the Contractor the actual cost of correcting such deficiencies, including compensation for the Architect's additional services and expenses made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

- 2.4.2 If, in the opinion of the Architect, it is evident that the Contractor has not completed or will not be able to substantially complete the Work in accordance with the contract documents due to default, negligence, or failure on the part of the Contractor, or their subcontractors, the Owner may, at its option, without prejudice, after the expiration of the second of two forty-eight hour written notices to the Contractor, complete certain portions of the Work as may be necessary, or augment the forces of the Contractor with additional manpower as may be required to complete the Work by the contracted completion date. In such case, an appropriate deductive Construction Change Directive shall be written, deducting from the contract price the actual costs incurred by the Owner to complete or augment the Work. Amount charged to the Contractor will be subject to the approval of the Architect. Such action, if taken by the Owner, shall not be interpreted by the Contractor as a termination of the contract as per Article 16 and the Contractor shall continue to carry out the Work or portions of the Work as may be required by the contract during this time frame.

ARTICLE 3

CONTRACTOR

3.1. DEFINITION

- 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

- 3.2.1 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner pursuant to Subparagraph 2.2.2; and shall at once report to the Architect errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner or Architect for damage resulting from errors, inconsistencies or omissions in the Contract Documents unless the Contractor recognized such error, inconsistency or omission and knowingly failed to report it to the Architect. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Architect, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction.

3.2.2 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the Architect at once.

3.2.3 The Contractor shall perform the Work in accordance with the Contract Documents and submittals approved pursuant to Paragraph 3.12.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless Contract Documents give other specific instructions concerning these matters.

3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, subcontractors and their agents and employees, and other persons performing portions of the Work under a contract with the Contractor.

3.3.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

3.3.4 The Contractor shall be responsible for inspection of portions of Work already performed under this Contract to determine that such portions are in proper condition to receive subsequent Work.

3.3.5 The Contractor shall make daily reports of activities onsite and shall submit copies of these reports with each monthly Application for Payment. Each daily report shall include the following information as a minimum:

- Project name
- Contractor
- Date
- Weather/temperature
- Number of persons present for each trade working on-site
- Number of Contractor's own forces present on-site
- Equipment present on-site
- Activity and work performed on-site
- Visitors on-site

3.4 LABOR AND MATERIALS

3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper

execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

- 3.4.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.5 WARRANTY

- 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.6 TAXES

- 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor which are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely schedule to go into effect.

3.7 PERMITS, FEES AND NOTICES

- 3.7.1 The contractor shall secure and pay for all required governmental permits, fees, licenses, inspections, and utility costs (such as water metering devices) for the proper execution and completion of the work. The only exceptions shall be the payment of impact fees, permit fees, and development fees. Gwinnett County Public Schools is exempt from payment of these particular fees on all school system construction projects.
- 3.7.2 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities bearing on performance of the Work.
- 3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.
- 3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Architect and Owner, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs.

3.8 ALLOWANCES

- 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents, items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities against which the Contractor makes reasonable objection.
- 3.8.2 Unless otherwise provided in the Contract Documents:
- 3.8.2.1 materials and equipment under an allowance shall be selected promptly by the Owner to avoid delay in the Work;
 - 3.8.2.2 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
 - 3.8.2.3 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and not in the allowances;
 - 3.8.2.4 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Clause 3.8.2.2 and (2) changes in Contractor's costs under Clause 3.8.2.3.

3.9 SUPERINTENDENT

- 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.
- 3.9.2 The Superintendent shall have supervised past projects of equal size and scope and have excellent performance references from the Owners for a minimum of three projects within a period of five years maximum. Contractors who and first and second apparent low bidders shall submit their appointed superintendent and project manager and references for review by the Owner and Architect within ten (10) days from the bid date and prior to contract signing. Owner and Architect shall have the right to reject any superintendent or project manager that does not, in their opinion have the required performance history to be in charge of this project.

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

- 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

The schedule shall be a time-scaled, critical path method (CPM) network diagram showing critical path and float for each activity.

- 3.10.2 The Contractor shall prepare and keep current, for the Architect's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Architect reasonable time to review submittals. This schedule shall be submitted to the Architect prior to the first application for payment.
- 3.10.3 The Contractor shall conform to the most recently approved construction and submittal schedules.
- 3.10.4 The Owner shall be able to conduct classes without disruption or interference, move buses in and out on paved surfaces; and secure, heat, cool, light the building, and deliver food.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

- 3.11.1 The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, addenda, Change Orders and other Modifications, in good order and marked currently to record changes and selections made during construction, and in addition approved Shop Drawings, Product Data, Samples and similar required submittals including all underground utilities. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.
- 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
- 3.12.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
- 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Architect is subject to the limitations of Subparagraph 4.2.8.
- 3.12.5 The Contractor shall review, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents may be returned without action.

- 3.12.6 The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect. Such Work shall be in accordance with approved submittals.
- 3.12.7 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
- 3.12.8 The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and the Architect as given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.
- 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals.
- 3.12.10 Informational submittals upon which the Architect is not expected to take responsible action may be so identified in the Contract Documents.
- 3.12.11 When Professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Architect shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.
- 3.12.12 The Contractor shall provide upon the Architect's request a shop drawing or submittal for any item, component, or system being furnished under the contract.
- 3.13 **USE OF SITE**
- 3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.
- 3.14 **CUTTING AND PATCHING**
- 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.
- 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner

or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

3.15 CLEANING UP

3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

3.16 ACCESS TO WORK

3.16.1 The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

3.17 ROYALTIES AND PATENTS

3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

3.18 INDEMNIFICATIONS

3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting there from, but only to the extent caused in whole or in part by negligent acts or omissions of the Contractor, s Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Paragraph 3.18.

3.18.2 In claims against any person or entity indemnified under this Paragraph 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the Indemnification obligation under this Paragraph 3.18 shall not be limited by a limitation on amount or type of damages,

compensation or benefits payable by or for the Contractor or a Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

- 3.18.3 The obligations of the Contractor under this Paragraph 3.18 shall not extend to the liability of the Architect, the Architect's consultants, and agents and employees of any of them arising out of (1) the preparation of approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect, the Architect's consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 4 **ADMINISTRATION OF THE CONTRACT**

4.1 ARCHITECT

- 4.1.1 The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.
- 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.
- 4.1.3 In case of termination of employment of the Architect, the Owner shall appoint an architect against whom the Contractor makes no reasonable objection and whose status under the Contractor Documents shall be that of the former architect.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

- 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents, and will be the Owner's representative (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the correction period described in Paragraph 12.2. The Architect will advise and consult with the Owner. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with other provisions of the Contract.
- 4.2.2 The Architect shall visit the site at least once a week to inspect and familiarize himself with the progress and quality of the Work and to determine if the Work is proceeding in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on site inspections to check quality or quantity of the Work. On the basis of on-site inspections as an architect, the Architect will keep the Owner informed of progress of the Work, and will endeavor to guard the Owner against defects and deficiencies in the Work.

- 4.2.3 The Architect will not have control over or charge of and will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility as provided in Paragraph 3.3. The Architect will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or of any other persons performing portions of the Work.
- 4.2.4 **Inspection Does Not Relieve Contractor.** Under the Contract Documents the Contractor has assumed the responsibility of furnishing all services, labor and materials for the entire Work in accordance with such documents. No provisions of this Article nor any inspection of the Work by the Owner, representatives of the Owner, engineers employed by the Architect, representatives of the Architect, or the Architect shall in any way diminish, relieve, or alter said responsibility and undertaking of the Contractor; nor shall the omission of any of the foregoing to discover or to bring to the attention of the Contractor the existence of any Work or materials injured or done not in accordance with said Contract Documents in any way diminish, relieve, or alter such obligation of the Contractor nor shall the aforesaid omission diminish or alter the rights or remedies of the Owner as set forth in the Contract Documents.
- 4.2.5 **Communications Facilitating Contract Administration.** Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate through the Architect. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.
- 4.2.6 Based on the Architect's inspections and evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.
- 4.2.7 The Architect will have authority to reject Work which does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable for implementation of the intent of the Contract Documents, the Architect will have authority to require additional inspection or testing of the Work in accordance with Subparagraphs 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing portions of the Work.
- 4.2.8 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time in the

Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Paragraphs 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

- 4.2.9 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Paragraph 7.4.
- 4.2.10 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion, will receive and forward to the Owner for the Owner's review and records written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final certificate for Payment upon compliance with the requirements of the Contract Documents.
- 4.2.11 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.
- 4.2.12 The Architect will be the interpreter of the requirements of the Contract Documents and the judge of the performance there under by both the Owner and Contractor.
- 4.2.13 The Architect will render interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with any time limit agreed upon. Either party to the Contract may make written request to the Architect for such interpretations.
- 4.2.14 All interpretations and decisions of the Architect shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. In his capacity as interpreter and judge, he will endeavor to secure faithful performance by both the Owner and the Contractor.
- 4.2.15 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

4.3 CLAIMS AND DISPUTES

- 4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract items, payment of money, extension of time or other relief with respect to the items of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

- 4.3.2 The Contractor shall assert claims solely on the basis of (a) principles of logic and (b) principles of law to which the Contractor, itself, subscribes. It shall not protest a decision or request a conference on the ground that a Subcontractor, materialman, or supplier has protested to the Contractor. Accordingly, the Contractor shall file no claim nor shall it make a request for a conference with the Owner regarding a claim except as it shall be for the purpose of asserting in the exercise of the Contractor's best judgment such views, requests, and legal propositions as it deems the Contractor is entitled to maintain independently of any right of any Subcontractor, materialman, or supplier against the Contractor.
- 4.3.3 Decision of Architect. Claims, including those alleging an error or omission by the Architect shall be referred initially to the Architect for action as provided in Paragraph 4.4. A decision by the Architect, as provided in Subparagraph 4.4.4, shall be required as a condition precedent to litigation of a Claim between the Contractor and Owner as to all such matters arising prior to the date final payment is due, regardless of (1) whether such matters relate to execution and progress of the Work or (2) the extent to which the Work has been completed. The decision by the Architect in response to a Claim shall not be a condition precedent to litigation in the event (1) the position of Architect is vacant, (2) the Architect has not received evidence or has failed to render a decision within agreed time limits, (3) the Architect has failed to take action required under Subparagraph 4.4.4 within thirty (30) days after the claim is made, (4) forty-five (45) days have passed after the Claim has been referred to the Architect or (5) the Claim relates to a mechanic's lien.
- 4.3.4 Time Limits on Claims. Claims by either party must be made within twenty-one (21) days after occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be made by written notice. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted in a timely manner.
- 4.3.5 Continuing Contract Performance. Pending final resolution of a Claim unless otherwise agreed in writing the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.
- 4.3.6 Waiver of Claims: Final Payment. The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:
- 4.3.6.1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
 - 4.3.6.2 failure of the Work to comply with the requirements of the Contract Documents; or
 - 4.3.6.3 terms of special warranties required by the Contract Documents.
- 4.3.7 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or (2) unknown physical

conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than twenty-one (21) days after the first observance of the conditions. The Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within twenty-one (21) days after the Architect has given notice of the decision. If the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

4.3.8 **Claims for Additional Cost.** If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Paragraph 10.3. If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds. Claim shall be filed in accordance with the procedure established herein.

4.3.9 **CLAIMS FOR ADDITIONAL TIME**

4.3.9.1 If the Contractor wishes to make Claim for an increase in the Contract Time, written notice shall be given within twenty-one (21) days. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

4.3.9.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the scheduled construction.

4.3.10 **Injury or Damage to Person or Property.** If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding twenty-one (21) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be filed as provided in Subparagraphs 4.3.7 or 4.3.8.

4.4 RESOLUTION OF CLAIMS AND DISPUTES

- 4.4.1 The Architect will review Claims and take one or more of the following preliminary actions within ten (10) days of receipt of a Claim: (1) request additional supporting data from the claimant, (2) submit a schedule to the parties indicating when the Architect expects to take action, (3) reject the Claim in whole or in part, stating reasons for rejection, (4) recommend approval of the Claim by the other party or (5) suggest a compromise. The Architect may also, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim.
- 4.4.2 If a Claim has been resolved, the Architect will prepare or obtain appropriate documentation.
- 4.4.3 If a Claim has not been resolved, the party making the Claim shall, within ten (10) days after the Architect's preliminary response, take one or more of the following actions: (1) submit additional supporting data requested by the Architect, (2) modify the initial Claim or (3) notify the Architect that the initial Claim stands.
- 4.4.4 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Architect, the Architect will notify the parties in writing that the Architect's decision will be made within seven (7) days, which decision shall be final and binding on the parties but subject to litigation. Upon expiration of such time period, the Architect will render to the parties the Architect's written decision relative to the Claim, including any change in the Contract Sum or Contract Time or both. If there is a surety and there appears to be a possibility of a Contractor's default, the Architect may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

**ARTICLE 5
SUBCONTRACTORS****5.1 DEFINITIONS**

- 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Document as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.
- 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

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

- 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to

the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner or the Architect, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner to Architect to reply promptly shall constitute notice of no reasonable objection.

- 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.
- 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection.
- 5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected if the Owner or Architect make reasonable objection to such change.

5.3 SUBCONTRACTURAL RELATIONS

- 5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require such Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by items of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement, which may be at variance with the Contract Documents. Subcontractors shall similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

- 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:
- 5.4.1.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Paragraph 14.2 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor in writing; and

- 5.4.1.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.
- 5.4.2 If the Work has been suspended for more than thirty (30) days, the Subcontractor's compensation shall be equitably adjusted.

ARTICLE 6
CONSTRUCTION BY OWNER
OR BY SEPARATE CONTRACTORS

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

- 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided elsewhere in the Contract Documents.
- 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.
- 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule and Contract Sum deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

6.2 MUTUAL RESPONSIBILITY

- 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.
- 6.2.2 If part of the Contractor's Work depends for proper execution of results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to report shall constitute an

acknowledgment that the Owner's or separate contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

- 6.2.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the party responsible therefore.
- 6.2.4 The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors as provided in Subparagraph 10.2.5.
- 6.2.5 Claims and other disputes and matters in question between the Contractor and a separate contractor shall be subject to the provisions of Paragraph 4.3 provided the separate contractor has reciprocal obligations.

6.3 OWNER'S RIGHT TO CLEAN UP

- 6.3.1 If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from the waste materials and rubbish as described in Paragraph 3.15, the Owner may clean up and allocate the cost among those responsible as the Architect determines to be just.

ARTICLE 7 CHANGES IN THE WORK

7.1 CHANGES

- 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.
- 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.
- 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.
- 7.1.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

7.1.5 All Changes in the Work shall be executed in a timely manner.

7.2 CHANGE ORDERS

7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect, stating their agreement upon all of the following:

7.2.1.1 a change in the Work;

7.2.1.2 the amount of the adjustment in the Contract Sum, if any; and

7.2.1.3 the extent of the adjustment in the Contract Time, if any.

7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Subparagraph 7.3.3.

7.2.3 In making proposals for consideration of Change Orders, the allowance for overhead and profit combined, included in the total cost to the Owner, shall be based upon the following schedule:

7.2.3.1 To the Contractor for Work which he performs with his own forces not to exceed twenty percent (20%) of his net additional cost.

7.2.3.2 To a Subcontractor for Work which he performs with his own forces not to exceed twenty percent (20%) of his net additional cost.

7.2.3.3 To the Contractor for Work which is performed by a Subcontractor not to exceed seven and one-half percent (7½%) of the amount due the Subcontractor.

7.2.4 Pending final determination of cost to the Owner, amounts not in dispute may be included in Applications for Payment. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

7.2.5 If the Owner and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be referred to the Architect for determination.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

- 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.
- 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
- 7.3.3.1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
 - 7.3.3.2 unit prices stated in the Contract Documents or subsequently agreed upon;
 - 7.3.3.3 in the case of Paragraph 2.4 above, actual costs incurred by Owner.
- 7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.
- 7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.
- 7.4 MINOR CHANGES IN THE WORK**
- 7.4.1 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or 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 Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 8 **TIME**

8.1 DEFINITIONS

- 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.
- 8.1.2 The date of commencement of the Work is the date established in the Agreement. The date shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible.
- 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Paragraph 9.8.
- 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

8.1.5 The term "working day" as used in the contract documents shall mean a day when premium pay is not required.

8.2 PROGRESS AND COMPLETION

8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor. The date of commencement of the Work shall not be changed by the effective date of such insurance.

8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

8.2.4 The Owner will require that the Contractor increase his work effort to achieve a six (6) day, ten (10) hour per day work week upon the determination that the construction progress is two (2) weeks behind the construction schedule as required by the General Conditions.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If the Contractor is delayed at any time in progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Paragraph 4.3.

8.4 DELAYS DUE TO ADVERSE WEATHER

8.4.1 Completion time will not be extended for normal bad weather. The time for completion as stated in the Contract Documents includes due allowance for days on which Work cannot be performed out-of-doors. For the purpose of this contract, the Contractor agrees that he may expect to lose working days to weather in accordance with the following table:

January-14 days	May-6 days	September-3 days
February-14 days	June-4 days	October-4 days
March-10 days	July-4 days	November-7 days
April-7 days	August-4 days	December- 10 days

- 8.4.2 If the total accumulated number of working days lost to the weather from the start of Work until the building is enclosed exceeds the total accumulated number to be expected 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 working days lost. No extension will be made for days of bad weather occurring after the building is enclosed. Furthermore, should a project fall behind the Contractor's original construction schedule, no extensions will be given for inclement weather days beyond the scheduled dry-in date plus any additional days due Contractor during such originally scheduled period. No changes in the Contract Sum will be authorized because of adjustment of Contract Time due to weather.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

- 9.1.1 The Contract Sum is stated in the Agreement, and including authorized adjustments, is the total amount payable by the Owner to the Contractor for 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 Architect a Schedule of Values properly allocated to various portions of the Work, prepared in the format shown in the project manual and supported by such data to substantiate its accuracy as the Architect may require. Upon receipt, the Architect/Engineer shall review and examine the Contractor's Schedule of Values, together with any supporting documentation or data which the Owner or the Architect/Engineer may require from the Contractor. The purpose of such review and examination shall be to protect the Owner from an unbalanced Schedule of Values which allocates greater value to certain elements of the Work than is indicated by such supporting documentation or data, or than is reasonable under the circumstances. If the Schedule of Values is not found to be appropriate, or if the supporting documentation or data is deemed to be inadequate, and unless the Owner directs the Architect/Engineer to the contrary in writing, the Schedule of Values shall be returned to the Contractor for revision or supporting documentation or data. After making such examination, if the Schedule of Values is found to be appropriate as submitted, or if necessary, as revised, the Architect/Engineer shall sign the Schedule of Values thereby indicating its informed belief that the Schedule of Values constitutes a reasonable, balanced basis for payment of the Contract Price to the Contractor. This Schedule shall be used as a basis for reviewing the Contractor's Applications for Payment.

9.3 APPLICATIONS FOR PAYMENT

- 9.3.1 Application for payment with supporting data shall be delivered to the architect on or before the first day of the month. The form of the Application for Payment shall be DE Form 0263, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet with schedule of values, and DE Form 0264 Summary of

Materials Stored Affidavit. This procedure shall be followed in order for the Architect to review the Work and approve payment in time for the Owner to make payment on the first Friday following the fifteenth of the same month. The Owner shall make progress payments on account of the Contract for 90% (10% will be retained) of the value of the Work properly performed, based on the Contract Sum, including Owner approved and signed Change Orders, and materials suitably stored at the site thereof, all as estimated by the Architect, less the aggregate of previous payments, until one-half (50%) of the Contract Sum is due (including all Owner approved and signed Change Orders).

9.3.2 Provided that:

9.3.2.1 the Work is not behind schedule;

9.3.2.2 the Work is being performed in a satisfactory manner in compliance with the Contract as determined by the Architect; and,

9.3.2.3 there are no outstanding claims on the property; (Contractor shall submit, with payment application, a lien release form for each subcontractor requesting payments.)

Further payments shall be made in the amount of 100% of the value of the Work properly performed and of materials suitably stored at the site thereof.

9.3.3 If:

9.3.3.1 the Work falls behind the progress schedule by as much as 10%;

9.3.3.2 the Work is being performed in an unsatisfactory manner or is non compliant with the Contract Documents as determined by the Architect; or

9.3.3.3 there are outstanding claims on the property,

the Owner shall reinstate the 10% retainage on all progress payments to be paid while one or more of such conditions continues to exist. The Contractor shall be given written notice by the Architect of the reinstatement of the retainage. If the Contractor's actual progress becomes more than 10% behind the Contractor's anticipated progress, the Owner may direct the withholding of payments to the Contractor in amounts equal to the percentage behind the Contractor's anticipated progress, in addition to the 10% described in all Items of Article 9.

9.3.4 If the Contractor recovers all lost time and puts the Work back on schedule and remedies all breaches referenced in Subparagraph 9.3.3, further payments shall be as described in Subparagraph 9.3.2.

9.3.5 Such applications for payment shall not include amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

9.3.6 If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably store off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance

by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

- 9.3.7 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

9.4 CERTIFICATES FOR PAYMENT

- 9.4.1 The Architect will, within seven (7) days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1.

- 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's inspection at the site and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

- 9.5.1 The Architect may decide not to certify payment and may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Subparagraph 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Subparagraph 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also decide not to certify payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment

previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss because of:

- 9.5.1.1 Defective Work not remedied;
 - 9.5.1.2 third party claims filed or reasonable evidence indicating probably filing of such claims;
 - 9.5.1.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
 - 9.5.1.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
 - 9.5.1.5 damage to the Owner or another contractor;
 - 9.5.1.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
 - 9.5.1.7 persistent failure to carry out the Work in accordance with the Contract Documents.
- 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

9.6 PROGRESS PAYMENTS

- 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.
- 9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require such Subcontractor to make payments to Sub-subcontractors in similar manner.
- 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.
- 9.6.4 Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.
- 9.6.5 Payment to material suppliers shall be treated in a manner similar to that provided in Subparagraphs 9.6.2, 9.6.3 and 9.6.4.

9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

9.6.7 There are not outstanding claims or liens on the property; (Contractor shall submit, with pay request, a lien release form for each subcontractor requesting payments. See Exhibit B.)

9.7 FAILURE OF PAYMENT

9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven (7) days after the date established in the Contract Documents the amount certified by the Architect, then the Contractor may, upon seven (7) additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and 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 accomplished as provided in Article 7.

9.7.2 The contractor shall be entitled to interest on any payment not made within the time limits set forth in the contract documents. The interest rate shall be 4 percent per annum, compounded daily.

9.8 SUBSTANTIAL COMPLETION

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. The Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion which shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. 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 Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

- 9.8.3 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Architect, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof as provided in the Contract Documents.

9.9 PARTIAL OCCUPANCY OR USE

- 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Subparagraph 11.3.1 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Subparagraph 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

- 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

- 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

9.10 FINAL COMPLETION AND FINAL PAYMENT

- 9.10.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in said final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Subparagraph 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

- 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing the insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner.
- 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, 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 Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims. The making of final payment shall constitute a waiver of claims by the Owner as provided in Subparagraph 4.3.6.
- 9.10.4 Project close-out is to be obtained no later than 60 days after the date of Substantial Completion. If, in the opinion of the Owner and Architect, it is evident that the Contractor is unwilling to bring the project to a close within the allotted time frame, and upon the issuance of two, 48 hour notices as set forth in Article 2, Paragraph 2.4.1, the Owner will then complete all unfinished work and/or assign a value to any incomplete work and documentation. The final application for payment will be adjusted accordingly.
- 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor of material supplier shall constitute a waiver of claims by the payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

- 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

10.1.2 The Contractor shall comply with provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from Work arising out of and in the course of employment on Work under the Contract. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage which may result from their improper construction, maintenance, or operation. He shall erect and properly maintain at all times as required by the conditions and progress of the Work proper safeguards for the protection of workmen and the public and shall post danger warnings against any hazards created by the construction operations.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

10.2.1.1 employees on the Work and other persons who may be affected thereby;

10.2.1.2 The Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

10.2.1.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, 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 sites and utilities.

10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

10.2.4.1 The Contractor shall notify the Architect and the Owner in writing that explosives or other hazardous materials, equipment, or unusual methods must be used in the execution of the Work, indicating precisely what, how, where, and when explosives, hazardous materials, equipment, or unusual methods will be used.

10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of

them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Clauses 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect 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 the Contractor's obligations under Paragraph 3.18.

- 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.
- 10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

10.3 EMERGENCIES

- 10.3.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Paragraph 4.3 and Article 7.

ARTICLE 11 **INSURANCE BONDS**

11.1 CONTRACTOR'S LIABILITY INSURANCE

- 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. In addition, the company furnishing the insurance shall have an A.M. Best Company rating of at least a Class "A" with a financial size of VI or greater. Insurance Certificates shall be accompanied by a letter stating company's current rating for verification, prior to acceptance by the Owner and execution of the formal Owner/Contractor agreement.
- 11.1.1.1 claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;
- 11.1.1.2 claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- 11.1.1.3 claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

- 11.1.1.4 claims for damages insured by usual personal injury liability coverage which are sustained (1) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or (2) by another person;
 - 11.1.1.5 claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting there from;
 - 11.1.1.6 claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle; and
 - 11.1.1.7 claims involving contractual liability insurance applicable to the Contractor's obligations under Paragraph 3.18.
- 11.1.2 The insurance required by paragraph 11.1.1 shall be written for not less than any limits of liability listed below or required by law, whichever is greater, and shall include contractual liability insurance as applicable to the Contractor's obligations under Paragraph 3.18.
- 11.1.2.1 The Contractor agrees that, prior to the beginning of any Work by the Contractor or any Subcontractor, as the case may be, he (the Contractor) will furnish the following to the Owner for himself, and will obtain, and retain in his files for the duration of the construction period, like certificates for each Subcontractor. Certificate from insurance company showing coverage of Workmen's Compensation Insurance for the state of Georgia or a certificate from Georgia Workmen's Compensation Board showing proof of ability to pay compensation directly.
 - 11.1.2.2 Original certificate from insurance company showing coverage for the Contractor for the following:
 - 11.1.2.3 Contractor's Protective and Public Liability Insurance: Taken out in the name of the Contractor.
 - 11.1.2.4 Personal Injury, including death - minimum limits of \$500,000 for each person and \$1,000,000 for each accident.
 - 11.1.2.5 Property Damage, minimum limits of \$300,000 for each accident and \$500,000 for aggregate of operations.
 - 11.1.2.6 Disposition: Certificate of insurance must be sent to Owner prior to commencement of Work. See following for endorsement required on this certificate.
- 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates shall contain a statement on every policy or certificate, as the case may be, that "The insurance company agrees that Policy No. _____ shall not be canceled, changed, or allowed to lapse until thirty (30)

days after the Owner and the Architect have received written notice as evidenced by return receipt of registered letter."

11.2 PROPERTY INSURANCE

- 11.2.1 The Contractor shall purchase and maintain property insurance upon the entire Work at the site, to the full (100%) insurable value thereof. This insurance shall include the interest of the Owner and the Contractor in the Work and shall insure against the perils of fire, extended coverage, and shall include all risk insurance for physical loss or damage including, without duplication of coverage, theft, vandalism, and malicious mischief.
- 11.2.2 If the property insurance requires minimum deductibles, the Contractor shall pay costs not covered because of such deductibles.
- 11.2.3 Unless otherwise provided in the Contract Documents, this property insurance shall cover portions of the Work stored off the site after written approval of the Owner at the value established in the approval and also portions of the Work in transit.
- 11.2.4 Boiler and Machinery Insurance. The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insured.
- 11.2.5 Loss of Use Insurance. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.
- 11.2.6 If the Contractor requests in writing that insurance for risks other than those described herein or for other special hazards be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.
- 11.2.7 Waivers of Subrogation. The Owner and Contractor waive all rights against (1) each other and any of their Subcontractors, Sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their Subcontractors, Sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Paragraph 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the Subcontractors, Sub-subcontractors, agents and employees of any of them by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of

indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

- 11.2.8 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interests may reach. If after such loss no other special agreement is made, replacement of damaged property shall be covered by appropriate Change Order.
- 11.2.9 The Owner as fiduciary shall have power to adjust and settle a loss with insurers.
- 11.2.10 Partial occupancy or use in accordance with Paragraph 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

11.3 PERFORMANCE BOND AND PAYMENT BOND

- 11.3.1 Contractor shall furnish both a Performance Bond and Payment Bond, each in the amount of 100% of the Contract Sum, unless otherwise directed by the Owner. The surety shall be one which is authorized to do business in the State of Georgia and is listed on the current "Department of the Treasury Circular 570" with an underwriting limitation not less than the Contract Sum. In addition, company furnishing bonds shall have an A.M. Best Company rating of at least a Class "A" with a financial size of VI or greater. Bonds shall be accompanied by a letter stating company's current rating for verification, prior to acceptance by the Owner and execution of the formal Owner/Contractor agreement.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING WORK

- 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Document, it must, if required in writing by the Architect, be uncovered for the Architect's observation and be replaced at the Contractor's expense without change in the Contract Time.
- 12.1.2 If a portion of the Work has been covered which the Architect has not specifically requested to observe prior to its being covered, the Architect may request to see such Works and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work is not in accordance with the Contract Documents, the Contractor shall pay such costs unless the condition was caused

by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

12.2 CORRECTION OF WORK

- 12.2.1 The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby.
- 12.2.2 If within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Subparagraph 9.8.2, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. This period of one year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation under this Subparagraph 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.
- 12.2.3 The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.
- 12.2.4 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Paragraph 2.4. If the Contractor does not proceed with correction of such nonconforming Work within a reasonable time fixed by written notice from the Architect, the Owner may remove it and store the salvageable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage within ten (10) days after written notice, the Owner may upon ten (10) additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Architect's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.
- 12.2.5 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contracts caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.
- 12.2.6 Nothing contained in this Paragraph 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the

Contract Documents. Establishment of the time period of one (1) year as described in Subparagraph 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

12.3 ACCEPTANCE OF NONCONFORMING WORK

- 12.3.1 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

- 13.1.1 The Contract shall be governed by the law of the State of Georgia.

13.2 SUCCESSORS AND ASSIGNS

- 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.3 WRITTEN NOTICE

- 13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.
- 13.3.2 Written notice transmitted via facsimile (FAX) shall NOT be accepted by the owner.

13.4 RIGHTS AND REMEDIES

- 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.
- 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act

constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

13.5 TESTS AND INSPECTIONS

13.5.1 Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so the Architect may observe such procedures. The Owner shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.

13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Subparagraph 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so the Architect may observe such procedures. The Owner shall bear such costs except as provided in Subparagraph 13.5.3.

13.5.3 If such procedures for testing, inspection or approval under Subparagraphs 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses.

13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly, and where practicable, at the normal place of testing.

13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.6 DRUG-FREE WORKPLACE ACT

13.6.1 The Contractor acknowledges that he is fully aware of the contents and requirements of Chapter 24 of Title 50 of the Official Code of Georgia Annotated. The Contractor, upon submission of a bid or proposal in connection with the Contract, does hereby certify that he and his Subcontractors are in compliance with the Drug-Free Workplace Act.

13.7 PUBLIC EMPLOYEE HAZARDOUS CHEMICAL AND RIGHT TO KNOW ACT OF 1988

- 13.7.1 The Contractor acknowledges that it is fully aware of the contents and requirements of Chapter 22 of Title 45 of the Official Code of Georgia Annotated. The Contractor by submitting a bid or proposal does thereby certify that it and its Subcontractors are in compliance with the aforesaid provisions of the law.

ARTICLE 14**14.1 TERMINATION BY THE CONTRACTOR**

- 14.1.1 If the Owner repeatedly fails to perform its material obligations to the Contractor for a period of thirty (30) days after receiving written notice from the Contractor of its intent to terminate hereunder, the Contractor may terminate performance under this Contract by written notice to the Owner and the Architect. In such event, the Contractor shall be entitled to recover from the Owner as though the Owner had terminated the Contractor's performance under this Contract for convenience pursuant to Subparagraph 16.1.1.1 hereunder.

ARTICLE 15**15.1 OWNER'S RIGHT TO SUSPEND CONTRACTOR'S PERFORMANCE**

- 15.1.1 The Owner shall have the right at any time to direct the Contractor to suspend its performance, or any designated part thereof, for any reason whatsoever, or without reason. If any such suspension is directed by the Owner, the Contractor shall immediately comply with same;
- 15.1.2 In the event the Owner directs a suspension of performance under this Article 15, through no fault of the Contractor, the Owner shall pay the Contractor as full compensation for such suspension the Contractor's reasonable costs, actually incurred and paid, of:
- (1) demobilization and remobilization, including such costs paid to subcontractors;
 - (2) preserving and protecting Work in place;
 - (3) storage of materials or equipment purchased for the Project, including insurance thereon;
 - (4) performing in a later, or during a longer, time frame than that contemplated by this Contract.

ARTICLE 16**16.1 TERMINATION BY THE OWNER**

- 16.1.1 The Owner may terminate this Contract in accordance with the following terms and conditions:

16.1.1.1 The Owner may, for any reason whatsoever, terminate performance under this Contract by the Contractor for convenience. The Owner shall give written notice of such termination to the Contractor specifying when termination becomes effective. The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders. The Owner may direct the Contractor to assign the Contractor's right, title and interest under termination orders or subcontracts to the Owner or its designee. The Contractor shall transfer title and deliver to the Owner such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights as the Contractor has. When terminated for convenience, the Contractor shall be compensated as follows:

- (1) The Contractor shall submit a termination claim to the Owner and the Architect specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the Owner or the Architect. If the Contractor fails to file a termination claim within one (1) year from the effective date of termination, the Owner shall pay the Contractor, an amount derived in accordance with Subparagraph (3) below;
- (2) The Owner and the Contractor may agree to the compensation, if any, due to the Contractor hereunder;
- (3) Absent agreement to the amount due to the Contractor, the Owner shall pay the Contractor the following amounts:
 - (a) Contract prices for labor, materials, equipment and other services accepted under this Contract;
 - (b) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the Work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for direct jobsite overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided however, that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;
 - (c) Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to Subparagraph 16.1.1.1 of this Paragraph. These costs shall not include amounts paid in accordance with other provisions hereof.

- (d) The total sum to be paid the Contractor under this Subparagraph 16.1.1.1 shall not exceed the total Contract Price, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment

16.1.1.2 If the Contractor does not perform the Work, or any part thereof, in a timely manner, supply adequate labor, supervisory personnel or proper equipment or materials, or if it fails to timely discharge its obligations for labor, equipment and materials, or proceeds to disobey applicable law, or otherwise commits a violation of a material provision of this Contract, then the Owner, in addition to any other rights it may have against the Contractor or others, may terminate the performance of the Contractor and assume possession of the Project site and of all materials and equipment at the site and may complete the Work. In such case, the Contractor shall not be paid further until the Work is complete. After final completion has been achieved, if any portion of the Contract Price, as it may be modified hereunder, remains after the cost to the Owner of completing the Work, including all costs and expenses of every nature incurred, has been deducted by the Owner, such remainder shall belong to the Contractor. Otherwise, the Contractor shall pay and make whole the Owner for such cost. This obligation for payment shall survive the termination of the Contract. In the event the employment of the Contractor is terminated by the Owner for cause pursuant to this Subparagraph 16.1.1.2 and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience under Subparagraph 16.1.1.1 and the provisions of Subparagraph 16.1.1.1 shall apply.

ARTICLE 17

17.1 LEGAL JURISDICTION

This agreement is made and delivered in Gwinnett County, Georgia. The Contractor and the Owner consent and agree that the Superior Court of Gwinnett County, Georgia shall have jurisdiction and venue over any action between the parties listed in The Gwinnett County Board of Education Standard Form of Agreement Between Owner and Contractor.



CAUTION: You should sign an original document which has this caution printed in red.

SECTION 00 801-G

SUPPLEMENTARY CONDITIONS

The following supplements modify, delete or add to the "General Conditions of the Contract for Construction, Gwinnett County Board of Education". Where any article, paragraph or sub-paragraph in the General Conditions is supplemented by one of the following paragraphs, the provisions of such article, paragraph, or sub-paragraph shall remain in effect and the supplemental provisions shall be considered added thereto. Where any article, paragraph or sub-paragraph, in the General Conditions is amended, voided, or superseded by any of the following paragraphs, the provisions of such article, paragraph or sub-paragraph not so amended, voided, or superseded shall remain in effect.

I. ARTICLE 1 - BASIC DEFINITIONS

- A. Any references made to the General Contractor will mean the Construction Manager.

II. ARTICLE 2 - OWNER

- A. Add to paragraph 2.2.4:

1. Sets of Construction Documents may be obtained as provided for in Request for Proposals. Specifications only shall be returned by all proposers. Any additional sets of complete Construction Documents or additional copies of selected sheets of Contract Drawings, or sections or pages of Specifications requested by the Contractor will be supplied and billed to the Contractor.

- B. Add new paragraph 2.5 COMMUNICATION:

- 2.5.1 All contact with the Owner shall be made to and through the Owner's Representative, identified in the Project Directory. The only other directions the Contractor may respond to and the Owner shall be responsible for are those issued by the Superintendent for Gwinnett County Public Schools, the Chief Operations Officer for the Department of Facilities and Operations and the Executive Director of Facility Planning and Construction, or his designated representative.
- 2.5.2 The Owner's Construction Coordinators are NOT inspectors. Their responsibility is to observe, and to work with the Architect and the Contractor in the coordination of all Owner- furnished items and any work by the Owner's personnel, coordination of construction which may directly affect existing school functions, review all paperwork and submittals such as pay requests, change orders, or shop drawings.
- 2.5.3 Correspondence from the Contractors through telefax communications is acceptable, however each fax transmittal shall be followed by an original sent to the Owner by mail.

III. ARTICLE 3 - CONTRACTOR

A. Add new paragraph 3.2.4:

3.2.4 In case of discrepancies or conflicts in the contract documents, the documents to hold precedence over others shall be in the following order:

- 3.2.4.1 The Owner-Contractor Agreement (including modifications thereto).
- 3.2.4.2 Change Orders - Those of a later date shall take precedence over those of an earlier date.
- 3.2.4.3 Written Amendments to the Contract Signed by Both Parties - Those of a later date shall take precedence over those of an earlier date.
- 3.2.4.4 Addenda - Those of a later date shall take precedence over those of an earlier date.
- 3.2.4.5 Clarifications
- 3.2.4.6 Supplementary Conditions
- 3.2.4.7 General Conditions
- 3.2.4.8 Specifications
- 3.2.4.9 Schedules
- 3.2.4.10 Details - Large scale details shall control over small scale drawings.
- 3.2.4.11 Other drawings
- 3.2.4.12 Drawings dimensioned
- 3.2.4.13 Drawings not dimensioned

B. Add new paragraph 3.2.5:

3.2.5 Items of work not shown in the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work, but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.

C. Add new paragraph 3.2.6 as follows:

3.2.6 MEASUREMENTS AND DIMENSIONS

- 3.2.6.1 Check and be responsible for correctness of all dimensions by taking measurements at the building before ordering material or doing work dependent for proper size of installation upon coordination with job conditions.
- 3.2.6.2 Refer discrepancies between Drawings, Specifications, and Project Conditions to Architect for adjustment before work affected thereby is begun.

- 3.2.6.3 No consideration shall be given any claim based on difference between actual dimensions and those shown on the drawings without first complying with 3.2.6.2 above.

D. Add new paragraph 3.3.6:

- 3.3.6 All grades, lines, levels and benchmarks for the work under this Contract shall be established and maintained by the Contractor, who shall verify all grades, lines, levels and dimensions indicated on the Drawings, and shall report all discrepancies before commencing work. The Contractor shall provide and maintain well-built batter boards at corners. He shall establish and safeguard benchmarks in at least two widely separated places. As work progresses, he shall establish and safeguard benchmarks at each level and shall establish exact locations of partitions on rough floors as a guide to trades. Any costs of corrective measure necessitated by erroneous establishment of grades, lines, levels and benchmarks shall be paid for by the Contractor.

E. Subparagraph 3.7.2, add the following:

- 3.7.2.1 The Contractor shall file a "Notice of Commencement" on each project as required on O.C.G.A. 44-14-361.5(b) and shall post a copy of notice on the project site.

F. Add new paragraph 3.7.5:

- 3.7.5 Required permits, licenses, inspections and certificates shall be carefully preserved and prominently posted during the construction period at the project for the easy, convenient access by the various inspecting authorities.

G. Add new paragraph 3.19 as follows:

3.19 PRE-CONSTRUCTION CONFERENCE

- 3.19.1 A Pre-Construction Conference shall be held prior to commencement of work. The purpose of this conference is to introduce all members of the construction team, which include the following:
- a. Owner's Representative
 - b. Architect's Representative
 - c. Contractor's Project Manager
 - d. Contractor's Superintendent
 - e. Electrical Subcontractor
 - f. Plumbing Subcontractor
 - g. HVAC Subcontractor
 - h. Fire Protection Subcontractor
 - i. Grader

- j. and to review and ensure all Contract Documents and Submittals are completed and in compliance with all Agreements. In addition, the Contractor shall submit 2 copies of all Post-Bid Information, as described below, for the Owner's and Architect's review.
- 3.19.2 A schedule of values for each major item of work included in the Contract shall be submitted on AIA Document G-703, continuation sheet and shall define both labor and materials costs for each. Provide breakdown per divisions and sections per table of contents of these specs. See sample form included in Section 01 370.
- 3.19.3 A statement designating all work to be performed by the Contractor's own forces shall be submitted.
- 3.19.4 A list of the name of all Sub-Contractors and names of other organizations proposed for each portion of the Work shall be properly executed on AIA document G805 - "List of Subcontractor's" - and shall be submitted for Owner's and Architect's review with 24-hour phone numbers.
- 3.19.5 The Performance Bond shall be properly executed on enclosed forms (Gwinnett County Public Schools, standard bond forms) and submitted in triplicate, as described in Section 00 600 - Bonds and Certificates. Bond rating letter shall be included.
- 3.19.6 The Labor and Materials Payment Bond shall be properly executed on enclosed forms and submitted in triplicate.
- 3.19.7 The Certificate for Insurance shall be properly executed on AIA Document G705 and submitted in triplicate.
- 3.19.8 A list of the names of all suppliers of principal materials and equipment shall be submitted for Owner's and Architect's review.
- 3.19.9 Construction Schedule, in CPM Network format, to Architect and Owner submitted to Owner within two weeks of award of contract.
- 3.19.10 A schedule of submittals including certifications, shop drawings, product data, samples, manuals, as built drawings and guarantees with dates of proposed submittals shall be submitted.
- 3.19.11 In addition to submittal of the previous items, the following topics will be discussed. The General Contractor is encouraged to have all subcontractors represented at the conference:
- 3.19.11.1 Introduction of all attending parties
 - 3.19.11.2 Channels and procedures for communication shall be discussed.
 - 3.19.11.3 Requests for substitution shall be issued in accordance with the requirements of Section 01 630 and Section 01 100, Para. 1.4.
 - 3.19.11.4 Issuance of RFP's (Requests for Proposals) by the Architect shall be addressed by the General Contractor within 7 calendar days of receipt thereof.

- 3.19.11.5 Change Order compensation shall be based on figures indicated in General Conditions.
- 3.19.11.6 Pre-construction submittals shall be issued as indicated in Supplementary Conditions, subparagraph 3.19.
- 3.19.11.7 Shop drawings, samples and other project submittals shall be issued in accordance with the requirements of Specification Section 01 100, Para 1.3.
- 3.19.11.8 Job Progress Meetings shall be held weekly at the job site. One weekly meeting per month will be held at the School Board Office to review the Contractor's Application for Payment. Pre-masonry, pre-roofing, pre-flooring, sample heat pump inspection and above ceiling inspection shall be held with owner, architect, general contractor and sub prior to that activity commencing.
- 3.19.11.9 Applications for Payment shall be issued in accordance with the requirements of Article 9 of the General Conditions of the Contract for Construction and all applicable Supplementary Conditions. All Applications for Payment shall be received by the Architect no later than the first day of each month and paid by the first Friday following the 15th day of the month. Retainage shall be as described in Supplementary Conditions, paragraphs 9.3.4, 9.5 and 9.10.5. (Retainage shall be 10 percent of the amount earned for the work in place, plus the value of stored materials up to and including 50 percent completion, then 0 percent until final completion, thereby reducing retainage at final completion to 5 percent of the contract amount (including change orders), subject to the approval of the Owner and the Architect. In other words, at 50 percent project completion, retainage will be 5 percent of the contract amount, plus approved change orders, until final completion is achieved. Retainage for individual subcontractors shall not be released separately as the subcontractors complete their work. Nor shall the retainage for individual subcontractors be reduced when payments beyond 50% of the individual contracts are released. Retainage shall only be reduced based on payments released in excess of 50% of the overall contract sum.
- 3.19.11.10 Safety precautions and programs shall be as directed by the General Contractor in accordance with the General Conditions, Article 10, and Part 1.9 in Section 01 100.

- 3.19.11.11 All required mockups such as brick, CMU, EIFS, joint sealers, interior and exterior door/frame assemblies, and hardware installations, lath and plaster, etc. shall be acknowledged.
- 3.19.11.12 Requests for time extension shall be issued in accordance with the requirements of the General and Supplementary Conditions, Article 8.
- 3.19.11.13 Discrepancies and conflicts in the Contract Documents shall be resolved using the order of precedence indicated in the Supplementary Conditions, paragraph 3.2.4.
- 3.19.11.14 The Date of Substantial Completion shall not be achieved and the Certificate of Substantial Completion shall not be issued prior to receipt of the official Certificate of Occupancy by the General Contractor. This requirement is indicated in Specification Section 01 700, Part 1.1.A. In addition, the Certificate of Substantial Completion shall only be issued in accordance with the requirements of Section 9 of the General Conditions of the Contract for Construction.
- 3.19.11.15 Contract closeout/final payment requirements are indicated in Section 01 700. Piecemeal delivery of final closeout documents and materials is unacceptable.
- 3.19.11.16 Materials testing shall be conducted under a separate contract by the Owner in accordance with the requirements of Section 01 400. The General Contractor shall note that he is responsible for payment of several testing services, as specified.
- 3.19.11.17 Immediately prior to Substantial Completion, the General Contractor shall prepare a comprehensive list of items to be corrected or completed (a punch list) for the Architect's review, in accordance with paragraph 9.8.2 of the General Conditions. The Architect shall then add to or delete items from the list during a Substantial Completion Inspection.
- 3.19.11.18 Permits, fees, licenses, etc. shall be addressed in accordance with the requirements of General Conditions, paragraph 3.7, all applicable Supplementary Conditions, and as follows:
- A. All work and material shall be in accordance with the National Electrical Code, the

Plumbing Code, and other applicable Federal, State, County, and municipal laws, ordinances, rules and regulations pertaining to construction, and nothing in these plans or specifications shall be construed to permit work not conforming thereto. The Contractor shall consult the Architect on all deviations regarding possible noncompliance and provide all labor and materials to complete the work as required by laws, ordinances, rules and regulations as directed by the Owner at no increase in cost to the Owner. He shall first confer with the Architect or Owner before making any determinations as to changes in quality, scope and/or increases in cost.

3.19.11.19 Compensation for stored materials shall be as defined in the General Conditions, and as follows:

- A. Material delivered for the Contractor to locations other than the site may be taken into consideration in the preparation of pay requests at the discretion and prior approval of the Owner, provided the Contractor furnishes satisfactory evidence that he has acquired title to such material that it will be utilized on the project covered by this contract in the form of an affidavit stating such. Contractor must provide proof of acceptable insurance coverage on material stored off-site prior to payment for same as well as invoices for such stored materials indicating transfer of the property to the Owner.

IV. ARTICLE 4 - ADMINISTRATION OF THE CONTRACT

- A. Add to paragraph 4.1.1: The Architect referred to in the Contract, the General Conditions, Supplementary Conditions or other documents of the contract shall mean "Lindsay Pope Brayfield Clifford & Assoc., Inc., Architects, 344 West Pike Street, Lawrenceville, GA 30046."

V. ARTICLE 6 - WORK BY OWNER OR BY SEPARATE CONTRACTORS

- A. Add paragraphs 6.1.4 and 6.1.5:

- 6.1.4 All Gwinnett County Schools have undergone the inspection for asbestos containing building materials that is required by AHERA (Asbestos Hazard Emergency Response Act). The Building Contractor will not be expected to remove and dispose of any asbestos containing

building materials except where specifically stated. No asbestos containing building materials shall be removed and disposed of except in strict accordance with AHERA and OSHA rules and regulations and by subcontractors who are accredited and licensed to do asbestos abatement and disposal. Copies of all completed/approved certificates and other reports and documents associated with asbestos abatement procedures performed shall be provided to the Owner. The Owner reserves the right to bring in outside approved Contractors or use his own forces to remove and dispose of asbestos containing building materials if he so desires.

6.1.5 Work included in the LAN Cabling Contract shall be contracted to the General Contractor, who shall be responsible for all coordination and scheduling.

VI. ARTICLE 7 - CHANGES IN THE WORK

A. Add new paragraph 7.1.6 as follows:

7.1.6 No extra work is to be done without a written change order or written authorization to proceed. Payment will not be authorized for any extra or changed work for which the Contractor has failed to secure such written change order. All change orders must be signed by the Owner.

B. Add new paragraph 7.2.6 as follows:

7.2.6 The following declaration from the Contractor, shall be attached to any and all Change Order proposals.
"I swear and affirm under criminal penalties for false swearing that the costs shown herein do not exceed current costs for like services or materials and do not exceed the actual costs to the Contractor therefore; and that the quantities shown do not exceed actual requirements."

C. Add new paragraph 7.2.7 as follows:

7.2.7 The General Contractor shall issue a response no later than 7 calendar days following receipt of all requests for proposals issued by the Architect concerning changes in the work.

VII. ARTICLE 8 - TIME

A. Add new paragraph 8.1.6 as follows:

8.1.6 "The Owner shall be able to conduct classes without disruption or interference; of buses in and out on paved surfaces; and secure, heat, cool, light the building, and deliver food.

B. Add to paragraph 8.2.1

1. The Contractor shall file a Notice of Commencement with the Clerk of the Superior Court of Gwinnett County no later than 15 days after physically

commencing work, with a copy to the Owner and Architect. See form in Section 00 802-1.

C. Add new paragraph 8.2.4 as follows:

8.2.4 When requested by the Architect, the Contractor shall furnish reports as are reasonably desirable as to the progress, condition of the job and anticipated schedule of completing the various phases of the work.

D. Add to paragraph 8.4.2:

1. No extension shall be allowed for precipitation.

VIII. ARTICLE 9 - PAYMENTS AND COMPLETION

A. Add new paragraph 9.2.2:

9.2.2 The schedule of values shall be prepared in the line item format on DE Form 0263, Application and Certification for Payment and on AIA Document G703 Continuation Sheet provided in Section 01 370, providing labor and material costs for each line item. Stored materials shall be summarized on Summary of Materials Stored Affidavit provided in Section 01 370.

B. Add to paragraph 9.3.1 as follows:

1. Supporting data shall include Schedule of Values from each Subcontractor requesting payment, broken down by labor and materials as the Architect requires. Copies of requisitions from subcontractors and material suppliers may be required. See sample continuation sheet at 01370. Application for payment must be signed by an officer of the company, stamped and crimped with the company seal and notarized.

C. Add to the end of subparagraph 9.3.2:

9.3.2Values related to General Contractor's and Subcontractor's overhead and profit, labor burden, insurance or any monies in addition to actual invoice amount for stored materials shall not be paid until the products are incorporated into the project. Actual invoices from suppliers must accompany application for payment. Materials stored or installed shall not be paid for if required submittals have not been completely reviewed.

- D. Add to paragraph 9.3.2.1: As determined, by the Architect only, from the Architect accepted, time scaled CPM schedule with monthly anticipated progress payment amounts submitted at or before the pre-construction meeting;

E. Add new paragraph 9.9.4:

- 9.9.4 Should the Project, or any portion thereof, be incomplete for Substantial Completion or final completion at the scheduled date or dates, the Owner shall have the right to occupy and/or complete any portion of the Project as set forth in Article 2, Paragraph 2.4.1. In such an event, the Contractor shall not be entitled to any extra compensation on account of said occupancy or by the Owner's normal full use of the project, nor shall the Contractor interfere in any way with said normal full use of the project. Further, the Contractor shall not be relieved of any responsibilities of the Contractor, including the required times of completion. Such occupancy by the Owner does not, in itself, constitute Substantial Completion nor Final Completion.

F. Add new paragraph 9.3.3.4:

- 9.3.3.4 No reduction in retainage shall be incorporated as an automatic in the contract. An reduction in retainage shall only be considered on a job by job basis, based on the condition of the project at the time of issuance of the Certificate of Substantial Completion. No additional reduction in retainage will be allowed beyond that amount agreed to at the time of substantial completion. The Owner will not release remaining funds until the punch list is complete and all required close out documentation has been reviewed, accepted and turned over to the Owner.

G. Add to end of paragraph 9.10.4:

1. The Contractor shall pay Owner amounts equal to the actual Owner's costs of continuing to provide administrative services on this Contract, until Final Completion.

H. Add new paragraph 9.10.6:

- 9.10.6 Final Payment Application - Actions and submittals which must precede or coincide with submittal of contractor's final payment application are listed in Section 01 700.

I. Add new paragraph 9.11

- A. Conditions for the reduction of retainage from 10 percent to no retainage are:
1. The work is not behind schedule as determined by the Architect only, from the Architect approved, time scaled CPM schedule with monthly anticipated progress payment amounts submitted at or before the pre-construction meeting;
 2. The work is being performed in a satisfactory manner in compliance with the contract documents as determined by the Architect;

3. There are no outstanding claims or liens on the property. Contractor shall submit, with pay request, a lien release form for each subcontractor requesting payments these lien release forms shall be properly notarized. See Exhibit "A".
4. Further payments, with total compliance of Attachment Exhibit "A" shall be made in the amount of 100% of the value of the labor and/or materials incorporated in the work and of materials suitably stored at the site thereof unless:
 - a. The percentage of work complete falls behind the percentage required by the construction progress schedule, as described in Attachment Exhibit "A" by as much as 10%; or
 - b. The work is being performed in an unsatisfactory manner and/or non-compliant with the contract documents as determined by the Architect; or
 - c. There are outstanding claims or liens on the property.
 - d. In which event or events, the Owner shall reinstate the 10% retainage on all periodical payments to be paid while one or more of the events continues to exist. The Contractor shall be given written notice, by the Architect, of the reinstatement of the retainage. If the Contractor's actual progress becomes more than 10% behind the Contractor's anticipated progress, as described in Item 9.6.3.1.a. the Owner may direct the withholding of payments to the Contractor in amounts equal to the percentage behind the Contractor's anticipated progress, in addition to the 10% described in all Items of Article 9.
5. If the Contractor recovers all lost time and puts the work back on schedule (0% behind schedule) per schedule described in Attachment Exhibit "A" and remedies all breaches, further payments shall be as described in Attachment Exhibit "A"; unless Items recur in which event or events the Owner shall reinstate retainage.

IX. ARTICLE 11 - INSURANCE BONDS

- A. Delete paragraphs 11.2.5 and replace with the following:

11.2.5 Loss of Use Insurance. The Contractor shall purchase and maintain additional property insurance to insure the Owner against loss of use of the Owner's property due to fire or other hazzards, however caused. The value of the entire upper building, 72,713 square feet, shall be covered and valued at \$9,800,000.00

X. ARTICLE 13 - MISCELLANEOUS PROVISIONS

- A. Add new sub-paragraph 13.8 as follows: Progress and Coordination Meetings/Reports:

13.8 The General Contractor and all sub-contractors requesting funds on the pending application for payment shall attend monthly Progress and

Coordination Meetings held in the Owner's office in Lawrenceville, Georgia, during the entire construction time of the project. Persons who shall attend:

- a. Contractor's Superintendent
- b. Contractor's Project Manager or Principal of the Contractor
- c. Any Sub-contractor requested to attend by the Architect or requesting funds on the pending AFP.
- d. Representative of Owner
- e. Representative of Architect
- f. In addition, weekly meetings shall be held at the job site. All parties mentioned above shall also attend the weekly meetings.

B. Add the following new sub-paragraph 13.9 as follows:

- 13.9 The Contractor shall provide copies of daily reports to the Architect prepared by the on-site job superintendent to be submitted monthly with each Application for Payment and copied to the Owner. Reports shall document temperature, weather conditions, workers present on site, work being performed, and other information deemed necessary to establish a daily history of the job progress. When requested by the Architect, the Contractor shall furnish reports as are reasonably desirable as to the progress, condition of the job and anticipated schedule of completing the various phases of the work.

END OF SUPPLEMENTARY CONDITIONS

SECTION 00 803

NOTICE OF COMMENCEMENT

Public Works

To: Clerk of the Superior Court of _____ County, Georgia

Pursuant to O.C.G.A. 36-82-104(f), not later than 15 days after physically commencing work, the undersigned gives Notice of Commencement of a public work including the following information:

1. Name, address and telephone number of the contractor:

2. Name and location of the public work being constructed or a general description of the improvement:

3. Name and address of the state, county, municipal corporation, or public board or body thereof which is doing the public work:

4. Name and address of the surety for the performance and payment bonds, if any:

5. Name and address of the holder of the security deposit provided pursuant to O.C.G.A. 13-10-1(b)(2)(B), if any:

(Contractor)

(Date)

*This document must be filed with the clerk of the superior court for the county in which the public work is located and a copy of this document must be posted at the public work site no later than 15 days after the contractor physically commences work on the public work.

**Within 10 calendar days of receipt of a written request, give a copy of this Notice of Commencement to any subcontractor, material man, or person making the request.

END OF SECTION

SECTION 01 100

SPECIAL CONDITIONS

The following Conditions are special to this project and should be considered an integral part of the work:

I. PART 1 - GENERAL

1.1 CONTRACT DRAWINGS AND SPECIFICATIONS

- A. In order to document those drawings, specifications and addenda that are part of the contract documents, a detailed list of drawings depicting the last revision date and specifications shall be attached to the Agreement Between the Owner and Contractor. The listed documents will then represent the permanent record set.
- B. Included at the end of this section is a copy of the following Report of Subsurface Exploration:
 - 1. "Report of Geotechnical Exploration and Site Seismic Hazard Study, Gwinnett School of Math, Science, and Technology, Old Norcross Road and McElvaney Lane, Gwinnett County, Georgia", by MACTEC (Project No. 6153-07-0175), dated August 7, 2007.
- C. Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.
- D. The Contractor shall check all drawings furnished him immediately upon their receipt and shall promptly notify the Architect of any discrepancies. Figures marked on drawings shall in general be followed in preference to scale drawings. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.

1.2 CONTRACTOR SUBMITTALS

A. General

1. Contractor shall make all of the following submittals to the Architect and/or Owner for review in strict accordance with applicable provisions of the contract documents.
 - a. Progress Schedule (CPM chart-see Section 01 112)
 - b. Schedule of Values
 - c. Certifications
 - d. Shop Drawings
 - e. Product Data/Material Lists
 - f. Samples
 - g. Substitutions (Prior Approval required)
 - h. Maintenance/Operating Manuals
 - i. As-Built Drawings
 - j. Guarantees
2. The term "review" as used herein in relation to analyzation of potential substitutions for specified products and processes, completed and ongoing work, project submittals and all other project conditions and components, shall adequately imply that the responsible party has checked the product(s) or situation(s) for general compliance with the original design intent. Following such "review", the responsible party shall have the capacity to reject or accept the product(s) or situation(s) for incorporation within the project in accordance with the contract conditions.
3. Corrections or comments made on the shop drawings during the Architect's/ Engineer's review do not relieve the contractor from his responsibility to comply with the requirements of the contract documents. Shop drawings shall be reviewed by the Architect/Engineer for general conformance with the design concept of the project and general compliance with Contract Documents requirements. The Contractor shall be responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with all other trades and performing his work in a safe and satisfactory manner.
4. Shop drawings and submittals which do not display evidence of contractor's review prior to submittal for Architect's/Engineer's review shall be promptly returned to the contractor for corrections prior to Architect's/Engineer's review. All products must be clearly marked or submittal will be rejected.
5. By reviewing and submitting shop drawings and other submittals for Architect's/Engineer's review, the contractor represents that he has determined and verified materials, field measurements and field construction criteria related thereto, and has checked and coordinated the information

contained within such shop drawings and other submittals with the requirements of the work and the contract documents. Contractor's review stamp shall clearly reflect the provisions of this wording.

6. An effort will be made by the Architect to discover any errors, but responsibility for accuracy and correctness shall be General Contractor's.
7. Review of submittals will be general and shall not relieve the Contractor from responsibility for proper fitting and construction of work, nor from furnishing materials and work required by Contract which may not be indicated on submittals when reviewed.
8. No portion of the work requiring submittals shall be commenced until submittal has been reviewed by the Architect. all such portions of work shall be in accordance with reviewed submittals.

1.3 SHOP DRAWINGS AND SUBMITTALS (see Articles 2.2.14 and 4.12 of the General Conditions)

A. Submittals shall include the following information, and be, provided to the Architect at least two weeks before the return of submittals is needed.

1. All submittals shall be accompanied by a transmittal form addressed to the Architect. Each submittal shall be consecutively numbered, and shall contain a list of items submitted, properly identified as to drawing numbers, specification section, or other identification.
2. Date and revision dates.
3. Project title and number.
4. The names of Contractor, subcontractor, and supplier or manufacturer.
5. Identification of product or material.
6. Relation to adjacent structure or material.
7. Field dimensions, clearly identified as such.
8. Contractor's stamp, initialed or signed, certifying review of submittal, verification of field dimensions and compliance with contract documents. Verbiage user on contractors review stamp shall be subject to Architects review. Submittal not displaying this stamp will be returned to the Contractor for review prior to Architect's review.
9. A 4" x 6" blank space for Architect's stamp.

B. Number of copies required:

1. Progress Schedule (CPM chart): 3 copies
2. Schedule of Values: 3 copies
3. Shop Drawings: Number requested to be returned plus three, (the Owner 1 copy, and the Architect 2 copies). One approved copy shall be maintained in the field trailer. An

extra copy of Mechanical shall be furnished to Owner to use for Test and Balance services.

4. Product Data/Material Lists: 5 copies
 5. Samples: As specifically indicated in specification sections.
 6. Samples for Color/Pattern Selection: Two sets of manufacturer's complete range for initial selection and 2 additional samples of selected color/pattern for inclusion in final color schedule.
 7. Certifications: 3 copies
 8. Proposed Substitutions: 3 copies of all required related data and information.
 9. Manuals: 3 copies.
 10. As-Built drawings: One set of completed revised specifications and bluelines with all change orders and addendas posted.
 11. Guarantees: 3 copies (including required warranty forms)
- C. If shop drawings or other submittals show variations from Contract requirements because of standard shop practice or some other reason, Contractor shall make specific mention of such variations in his letter of transmittal, as well as on the shop drawings and submittals. Unless specific changes have been noted and reviewed by the Architect and the Owner, no deviations from Contract Documents shall be accepted.
- D. For manufacturer's standard schematic drawings, contractor shall:
1. Modify drawings to delete information which is not applicable to project
 2. Supplement standard information to provide additional data applicable to project
- E. Provide manufacturer's recommendations for installation, handling and storage of materials with submittals. For manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data, contractor shall:
1. Clearly mark each copy to identify pertinent materials, products or models
 2. Show dimensions and clearances required
 3. Show performance characteristics, capacities, installation requirements and maintenance requirements
 4. Show wiring diagrams and controls
 5. Where it is required in the specifications that materials, products, processes, equipment or the like be installed or applied in accordance with manufacturer's instructions, directions, or specifications, it shall be construed to mean that said application or installation shall be in strict accordance with printed instructions furnished by the

manufacturer of the material concerned for use under conditions similar to those at the job site.

6. Certifications - Where specifically indicated by pertinent Specification Sections, proper certification by a recognized laboratory or association shall be submitted. Certifications shall attest to product compliance with requirements of the Contract Documents.

F. Samples

1. Physical examples of products submitted to Architect shall illustrate materials, finishes, workmanship and shall establish standards by which completed work shall be judged by Owner and Architect.
2. Architect's office samples shall be of sufficient size and quantity to clearly illustrate:
 - a. Functional characteristics of product or material, with integrally related parts and attachment devices
 - b. After Architect's review, samples may be used in construction of Project
3. Field Samples and Mockups
 - a. Erect samples and mockups at project site in location acceptable to Architect and Owner
 - b. Construct each sample or mockup complete, including work of all trades required in finished work.

G. Schedule of Submittals

1. A Schedule of Submittals is provided at the end of this section; which is intended as a guide to the Contractor in preparation of required submittal data and should not be considered a complete listing.
2. Where submittals are indicated, they are required even though submitted material is as specified.
3. The Contractor shall prepare a submittal register using the following as guidance. The register will be updated monthly and three updated copies shall be furnished to the Architect each month.

- H. Electronic files in AutoCADD format will be made available to the successful Proposer and his Subcontractors for a fee to the Architect or Engineer to remove all professional seals, title blocks or other information deemed appropriate by Architect or Engineer. Fee shall be \$150 per file.

1.4 PRIOR APPROVALS AND SUBSTITUTIONS (SEE SECTION 01 630)

- A. Requests for prior approval must be submitted prior to bid per Section 01 630. No requests for substitution shall be considered after bid except as outlined in Section 01 630.

- B. Architect's review shall be required for all prior approvals and substitutions.
1. Contract is based on materials, equipment, and systems described in the Contract Documents.
 2. Architect will consider proposals for all prior approvals and substitutions of materials, equipment, and systems only when such proposals are accompanied by full and complete technical data and all other information required in Section 01 630.
 3. Unapproved substitute materials, equipment, or systems will be rejected.
- C. Acceptance of proposed substitution shall not relieve the Contractor from responsibility for compliance with all requirements of contract documents. Contractor shall be responsible at his own expense, for any changes in other parts of his own work or work of others which may be caused by acceptable substitutions.

1.5 ACCIDENT PREVENTION

- A. Precaution shall be exercised to reduce the extent and severity of work related injuries and illnesses. The Contractor shall comply fully with OSHA's Construction Industry Standards by:
1. Having a written program addressing worksite safety and health
 2. Providing training to supervisors and employees on hazards, and methods for avoiding them,
 3. Complying with the Standards published in Title 29 of the Code of Federal Regulations.

1.6 OVERLOADING

- A. Contractor shall be responsible for overloading any part or parts of the structure beyond their safe load carrying capacities. Do not place loads on any part of the structure until all supports, framing, or bracing is completed. Temporary shoring shall be the responsibility of the general contractor.

1.7 LOCATION OF EXISTING WORK

- A. The Contractor shall determine the locations of existing site utilities and improvements and coordinate them with the Work defined in the Drawings and Specifications.
- B. The Contractor shall notify all local utility companies and underground locator service at 770-623-4344 or 1-800-882-7911 prior to commencing with any subsurface excavations or grading operations. If the location of existing utilities are in conflict with the

requirements of the Contract Documents, the Contractor shall notify the Architect immediately and shall await instructions from the Architect.

1.8 LAYING OUT WORK

- A. Prior to commencing work, the Contractor shall carefully compare and check all construction documents with one another which in any way affect the location or elevation of the work to be executed by him. Should any discrepancy be found, it shall immediately be reported to the Architect for verification and adjustment.
- B. Contractor shall exercise proper precautions to verify figures and dimensions shown on the Drawings before laying out work and will be held responsible for any error resulting from his failure to exercise such precaution. Drawings shall not be scaled for any purpose.

KEY

- A. CERTIFICATIONS
- B. SHOP DRAWINGS
- C. DATA/LIST OF MATERIALS
- D. SAMPLES
- E. MANUALS
- F. AS-BUILTS
- G. GUARANTEE (OVER 1 YEAR)

A B C D E F G

DIVISION 2 - SITE WORK

<u>Section</u>	<u>Title</u>								
02 270	Erosion, Sedimentation and Pollution Control	-	-	X	X	-	-	-	-
02 280	Termite Control	X	-	X	-	X	-	X	-
02 514	Site Concrete	X	-	X	-	-	-	-	-
02 581	Tactile Warning Strips	-	-	X	-	-	-	-	-
02 720	Storm Drainage	X	X	X	-	-	-	X	-
02 831	Chain Link Fences and Gates	X	X	X	-	-	-	-	-
02 933	Temporary Seeding	-	-	X	-	-	-	-	-

DIVISION 3 - CONCRETE

<u>Section</u>	<u>Title</u>								
03 200	Concrete Reinforcing	-	X	-	-	-	-	-	-
03 300	Cast-In-Place Concrete	X	-	X	-	-	-	-	-
03 450	Architectural Precast Concrete	X	X	X	X	-	-	-	-

DIVISION 4 - MASONRY

<u>Section</u>	<u>Title</u>								
04 100	Mortar	-	-	-	X	X	-	-	-
04 105	Masonry Grouts	X	-	X	-	-	-	-	-
04 150	Masonry Reinforcing & Accessories	-	-	X	-	-	-	-	-
04 210	Brick Masonry	X	-	X	X	-	-	-	-
04 220	Concrete Masonry Units	X	-	X	-	-	-	-	-

DIVISION 5 - METALS

<u>Section</u>	<u>Title</u>								
05 120	Structural Steel	X	X	X	-	-	-	-	-
05 505	Metal Fabrications	X	X	X	-	-	-	-	-

DIVISION 6 - CARPENTRY

<u>Section</u>	<u>Title</u>								
06 100	Rough Carpentry	X	-	-	-	-	-	-	-
06 200	Plastic Laminates	X	X	X	X	-	-	-	-
06 400	Architectural Woodwork	-	X	X	-	-	-	-	-

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

<u>Section</u>	<u>Title</u>								
07 150	Dampproofing	X	-	X	-	-	-	-	X
07 190	Vapor Barriers	X	-	X	-	-	-	-	-
07 200	Insulation	X	-	X	-	-	-	-	-

KEY

- A. CERTIFICATIONS
 B. SHOP DRAWINGS
 C. DATA/LIST OF MATERIALS
 D. SAMPLES
 E. MANUALS
 F. AS-BUILTS
 G. GUARANTEE (OVER 1 YEAR)

A B C D E F G

07 240	EIFS	X	-	X	X	-	-	X
07 520	Four-Ply Built-Up Roofing	X	X	X	X	-	-	X
07 600	Flashing & Sheet Metal	-	X	X	X	-	-	X
07 651	Wall Flashings	X	-	X	X	-	-	X
07 900	Joint Sealers	-	-	X	X	-	-	X

DIVISION 8 - DOORS AND WINDOWS

<u>Section</u>	<u>Title</u>							
08 100	Metal Doors and Frames	X	X	X	-	-	-	-
08 210	Wood Doors	X	X	X	X	-	-	X
08 330	Electrically Operated Overhead Doors	X	X	X	X	-	-	X
08 410	Aluminum Storefront	X	X	X	X	-	-	X
08 710	Finish Hardware	X	X	X	-	-	-	X
08 800	Glass and Glazing	X	X	X	X	-	-	X

DIVISION 9 - FINISHES

<u>Section</u>	<u>Title</u>							
09 100	Metal Support Systems	X	-	X	-	-	-	-
09 260	Gypsum Board Systems	X	-	X	-	-	-	-
09 310	Ceramic, Porcelain & Quarry Tile	X	-	X	X	-	-	-
09 510	Acoustical Ceilings	X	X	X	X	-	-	-
09 650	Resilient Flooring	-	-	X	X	-	-	-
09 685	Carpeting	X	X	X	X	X	-	X
09 900	Painting	-	-	X	X	-	-	-

DIVISION 10 - SPECIALTIES

<u>Section</u>	<u>Title</u>							
10 001	Miscellaneous Specialties	-	X	X	X	-	-	-
10 100	Visual Display Boards	X	X	X	X	X	-	X
10 155	Solid Polymer Toilet Compartment	-	X	X	X	-	-	-
10 440	Signs and Numbers	-	X	X	X	-	-	-

DIVISION 11 - EQUIPMENT - N/ADIVISION 12 - FURNISHINGS - N/ADIVISION 13 - SPECIAL CONSTRUCTION - N/ADIVISION 14 - CONVEYING SYSTEMS - N/A

KEY

- A. CERTIFICATIONS
- B. SHOP DRAWINGS
- C. DATA/LIST OF MATERIALS
- D. SAMPLES
- E. MANUALS
- F. AS-BUILTS
- G. GUARANTEE (OVER 1 YEAR)

A B C D E F G

DIVISION 15 - MECHANICAL

Section Title

See each section for individual requirements.

DIVISION 16 - ELECTRICAL

Section Title

See each section for individual requirements.

END OF SECTION

SECTION 01 112

PROGRESS SCHEDULES

I. PART 1 - GENERAL

1.1 SCOPE

A. Requirements

1. Promptly following award of Contract, Contractor shall prepare and submit to Engineer estimated construction progress schedules for the project, with subschedules of related activities which are essential to its progress.
2. The schedule shall reflect the critical elements contained in the Owner's Overall Project Schedule for the beginning and completion dates of those components.
3. Schedule shall identify all activities expected to interrupt or affect the on-going school activities.
4. Contractor shall submit revised progress schedule with each subsequent request for payment.
5. Preliminary schedule shall be distributed at the Pre-Construction Conference, and final schedule completed within two (2) weeks of meeting.

1.2 SCHEDULE FORM

A. Prepare progress schedules in CPM Network form.

1. Provide separate responsibility of early start listing and location code listing.
2. Identify each work day of each week on horizontal time scale.
3. Allow space for notations and future revisions.
4. Sheet size shall be 24" x 36" for progress schedules.
5. CPM Schedule shall be in precedence form.

B. Format of listings shall comply with the chronological order of start of each item of work along the Critical Path. All items of work which constitute a component of the Critical Path shall be readily identifiable.

C. Identify listings by pertinent major specification section.

1.3 SCHEDULE CONTENT

A. Progress Schedules shall indicate the following:

1. Complete sequence of construction by activity along Critical Path
2. Dates for beginning and completion of each major element of construction based on early start and late start.
3. Projected percentage of completion for each period.

4. Cost load the CPM Schedule to show precalculated dollar value to percentage of completion.
 5. Show float time and number of days duration for each activity.
 6. Show predecessor and successor activities for each activity.
- B. Provide submittal schedule for shop drawings, product data and samples which indicates:
1. Key dates for Contractor's submittal sequence
 2. Dates reviewed submittals will be required from Engineer
- C. Include product delivery schedule which indicates delivery dates for products specified under allowances.
- D. Provide subschedules to define critical portions of prime schedules.

1.4 SUBMITTALS

- A. Contractor shall submit initial progress schedules no later than 15 days following award of Contract. Engineer and Owner shall review progress schedules and return reviewed copies within ten days following receipt. If required by Engineer or Owner, Contractor shall resubmit schedules within seven days after return of reviewed copy until accepted. The accepted schedule shall remain as the basis for determining whether the General Contractor is on schedule, ahead of schedule or behind schedule.
- B. Contractor shall submit 3 copies of updated progress schedules to Engineer with each application for payment.

1.5 PROGRESS REVISIONS

- A. Indicate progress of each activity up to date of submittal of updated progress schedule.
- B. Show changes occurring since previous submittal of progress schedule including:
1. Major changes in project scope
 2. Activities modified since previous submittal
 3. Revised projections of progress and completion date
 4. Other identifiable changes
- C. Provide project narrative report which defines:
1. Problem areas, anticipated delays and impact on schedule
 2. Corrective action recommended and its proposed effect
 3. Effect of changes on schedules of primary subcontractors

1.6 DISTRIBUTION

- A. Contractor shall distribute copies of reviewed progress schedules to job site file, subcontractors and all other concerned parties.
- B. Contractor shall instruct recipients to report promptly, in writing, any problems anticipated by projections shown in progress schedules.

END OF SECTION

Job Name: MAXWELL HIGH SCHOOL - PHASE 3D - MAIN BUILDING RENOVATION

Reimbursement Request No. _____ Project No. LPBC-210036 Improvement No. _____

CERTIFICATE OF THE CONTRACTOR OR HIS DULY AUTHORIZED REPRESENTATIVE

To the best of my knowledge and belief, I certify that all items, units, quantities, and prices of work and material shown on this Reimbursement Request No. _____ are correct; that all work has been performed and materials supplied in full accordance with the terms and conditions of the contract documents between _____ and _____ dated: _____

(Owner) _____ (Contractor) _____
and all authorized changes thereto; and that the following is a true and correct statement of the contract account up to and including the last day of the period covered by this estimate and that no part of the "amount due this estimate" has been received.

1. Original Contract Sum	\$ _____
2. Net Change by Change Orders	\$ _____
3. Contract Sum To Date (1 + 2)	\$ _____
(a) Total amount earned for work in place (original contract)	\$ _____
(b) Total amount earned for work in place (change orders)	\$ _____
(c) Value of materials stored at site	\$ _____
(d) Total amount earned - (a) plus (b) plus (c)	\$ _____
(e) Amount retained (10%)	\$ _____
(f) Total earned less retained percentage - (d) minus (e)	\$ _____
(g) Total previously approved	\$ _____
(h) Amount due THIS REQUEST FOR CONTRACTOR- (f) minus (g)	\$ _____
(i) Amount due THIS REQUEST FOR ARCHITECT	\$ _____
(j) TOTAL AMOUNT REQUESTED - (h) plus (i)	\$ _____

Further certify that all claims outstanding against the undersigned Contractor for labor, materials, and expendable equipment employed in the performance of said contract have been paid in full in accordance with the requirements of said contract, except such outstanding claims as are listed below or on the attached sheet, which statement contains all claims against the Contractor which are not yet paid, including all disputed claims to which the contractor has or will assert any defense.

I further certify that all the materials indicated on the Reimbursement Request as being stored on the site, but not yet incorporated into the building, have been purchased, delivered, and are now stored on the site for future incorporation into the building, and until so incorporated the title to same is, upon payment of this statement, vested in the Owner. Furthermore, the undersigned contractor assumes full responsibility for the existence, protection, and, if necessary, replacement of the above-mentioned materials until the completion of this contract.

Contractor: _____ By: _____

Date: _____ Title: _____

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

Notary Public: _____

My Commission Expires: _____

STATEMENT OF THE REVIEWING ARCHITECT

I have verified this Reimbursement Request and that to the best of my knowledge and belief it is a true and correct statement of work performed and materials supplied by the Contractor and that the Contractor's certified statement of his account and the amount due him is correct and just and that all work and material conditions of the contract documents and authorized changes thereto.

Name _____ Reviewing Architect Date: _____
LINDSAY POPE BRAYFIELD CLIFFORD & ASSOC.

SUMMARY OF MATERIALS STORED

In support of Reimbursement Request No. _____

Job Name _____

(Project Improvement No.) _____ Period Ending: _____

Contractor: _____

ITEM NO.	NAME (Contractor or Sub-Contractor)	TYPE OF MATERIAL	QUANTITY	AMOUNT (Dollars)
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TOTALS

Prepared by _____ for _____
(Contractor)

Date _____, and certified by him to be a true and accurate.

Checked and concurred in:

By: _____
(Resident Engineer Inspector or Architect)

Date: _____

SCHEDULE OF CHANGE ORDERS

In support of Reimbursement Request No. _____

Job Name _____

(Project Improvement No.) _____ Period Ending: _____

Contractor: _____

CHANGE ORDERS		ADDITIONS		DEDUCTIONS	
Number (1)	Date (2)	Authorized Amount (3)	Amount This Period (4)	Completed Previous Periods (5)	Authorized Deductions (6)

SECTION 01 400

QUALITY CONTROL

I. PART 1 - GENERAL

1.1 ON SITE OBSERVATIONS

- A. All work and materials shall be subject to review by the Architect and Owner.
- B. The Contractor shall fully cooperate and shall furnish all reasonable facilities for the inspections of all parts of the work during the entire construction period.

1.2 TESTING SERVICES

- A. All materials upon which the strength and durability of the work may depend, shall be subject to inspection and testing to establish conformance with the drawings and specifications.
- B. A material testing company will be selected by the Owner, employed by the Owner and paid by the Owner, to perform soils testing services for the project. The testing company will retain the services of the Geotechnical Engineer. Services described in Paragraphs 1.3 A thru I below will be paid for by the Owner. The testing company will conduct all required testing and issue reports reflecting the conditions observed. The General Contractor will coordinate all activities and ensure that he receives a copy of the Owner's Testing Agency's Daily Field Report each day that the Testing Agency's Representative is onsite prior to the Representative leaving the site.
- C. It is the responsibility of the Contractor to implement the services of the testing company by ordering those services at the appropriate time in the work, as described below. The Contractor must provide at least 24 hours notice to the testing company for required testing work. Failure to provide adequate notification may result in the requirement for more complex after-the-fact testing, for which the Contractor will be liable.
- D. Testing required under Paragraphs 1.3 C, E, F, G, I, J, K and L are to be coordinated by the General Contractor, to be witnessed by the appropriate local inspection agencies as well as by the Architect and/or Owner's Representative. The Contractor will secure and maintain evidence of having completed and obtained successful results for those tests, to be transmitted to the Owner and Architect no later than 15 days following testing.

1.3 SUMMARY OF REQUIRED TESTING:

A. Earthwork:

1. The testing company and the Geotechnical Engineer shall monitor subgrade preparation, foundation bearing grades, and test all backfill. All excavation, preparation of foundation bearing grades, and earthwork related construction must be performed in the presence of the testing company and/or Geotechnical Engineer.
2. Proposed Fill Material: Prior to importing any fill material to the site, the testing company shall verify that the proposed fill material is of suitable quality for the intended use. Any residual or previous fill material from on-site proposed to be reused in a qualified manner in the new work shall also be tested for suitability prior to replacement.
3. Residual Material: After stripping, clearing operations and excavating have been completed to the specified excavation limits, the residual material over which additional fill, construction or pavement, is to be placed shall be verified by the testing agency to be suitable for the intended purpose. This shall be accomplished by proof rolling the areas under construction, by test pits, or by other measures deemed appropriate by the testing company and Engineer. Proofrolling shall be performed by the General Contractor using a ten (10) ton smooth drum static roller. Unsuitable areas shall be undercut and backfilled with structural fill as directed by the testing service and Engineer.
4. Controlled Fill: Material to be placed in a qualified manner as defined in the site work Specifications shall be tested to confirm that the required conditions are met. This shall be accomplished by using in-place density and proctor tests at the minimum rate of one test per 2500 square feet per one foot of lift and one test for every 50 lineal feet for each 2 feet of depth for wall and trench backfill. The testing shall also indicate the type of material observed, the location of the test, the material moisture content and the current weather. Delivery and compaction of fill material shall be made during the presence of the testing company's representative and shall be subject to his approval. The inspection by no means absolves the contractor from responsibility of compaction as specified.
5. All foundation bearing grades must be monitored by the Geotechnical Engineer and tested by the testing company prior to placement of foundations and/or footings.
6. Completed Work: Unless material is covered with finish surfaces (footing, slabs, paving, etc.) immediately following procedures described in 2. and 3. above, the material shall be reviewed by the testing company again prior to the placement of those finished surfaces. The purpose of this final review is to preclude deterioration of the required conditions from continuing construction, water, or similar causes.

- B. At the completion of the HVAC work when the systems have been made fully operational, a testing and balancing (TAB) company shall be retained by the Owner to test the HVAC system for conformance to the project requirements. The report will be provided to the Owner and to the Contractor, who will make the necessary adjustments in order to produce the system design results. The Owner may elect to retest the system after adjustments have been made.
- C. Cast-In-Place Concrete:
1. Design mix of the concrete suppliers shall be reviewed by Structural Engineer and testing agency prior to composing first batch. Batch tests will be required on the advice of the material testing company. Costs of all tests shall be paid for by Owner. General Contractor shall coordinate all scheduling.
 2. Slump tests shall be conducted on every 20 cubic yards of concrete used on the project. Concrete cylinders shall be taken by the testing agency at the rate of one set of four per 100 cubic yards of material per day or less. One cylinder shall be broken at 7 days and two at 28 days. If the two breaks at 28 days average less than their design strength, the last will be held for a 56 day break. If the first two are over designed, the third cylinder will be broken for a 3 cylinder average. Air entrainment test will be taken as required by ASTM C231. The slump tests, cylinders, and air entrainment tests shall be taken by the testing company. The cylinders shall be used to report compressive strength, air content, additives, slump and date/time/exact location and weather when made.
 3. Copy of all tests shall be sent immediately to the architect and owner's offices by mail. Any cylinder break that is less than design strength shall be immediately faxed to architect.
 4. Compressive strengths shall be as defined at Sections 02 514 and 03 300.
- D. Concrete Slab Moisture Tests:
1. As defined in Section 03 300.
- E. Masonry:
1. Brick & Concrete Block: A sample section of wall shall be built by the Contractor using the specified brick and block units and the specified mortar and acceptable pre-mix grout. The section shall be as specified. This sample wall section shall then be inspected by the Architect and if acceptable will become the Standard of Quality for the project.

2. Inspection: Masonry inspections to conform to Level 1 inspection requirements as set forth in Table 1704.5.1 of the International Building Code, 2006 Edition with 2007 and 2009 Georgia Amendments. The requirements of Table 1704.5.1 are described below.
 - a. The Engineer of Record is responsible for the following tasks:
 - (1) Submittal Review for verification of proportions for site prepared mortar and grout.
 - (2) Submittal Review to verify size and location of structural masonry elements.
 - (3) Submittal review to verify grout placement complies with code and construction document provisions.
 - (4) Submittal Review of certificates of compliance used in masonry construction
 - (5) Review submittals for verification of f'm prior to construction.
 - b. The Testing Agency is responsible for the following on a periodic basis:
 - (1) Field inspection to verify construction of mortar joints.
 - (2) Field inspection to verify the location of reinforcement and connectors.
 - (3) Field inspection to verify the size and location of structural masonry elements.
 - (4) Field inspection to verify the type, size, and location of anchors, including details of anchorage of masonry to structural members, frames, or other construction.
 - (5) Field inspection to verify the size, grade, and type of reinforcement.
 - (6) Field inspection to verify welding of reinforcing bars.
 - (7) Field inspection to verify protection of masonry during hot/cold weather.
 - (8) Field inspection to verify grout space is clean prior to grouting.
 - (9) Field testing to verify f'm prior to construction
 - (10) Field review to verify proportions of materials in mortar and grout as delivered to the site.
 - c. The Testing Agency is responsible for the following on a continuous basis:
 - (1) Field review of the preparation of grout specimens, mortar specimens, and/or prisms.
 - (2) Field Testing to verify f'm every 5000 SF during construction.
 - (3) Verify grout placement complies with code and construction document provisions.

F. Grout:

1. Grout: A design mix for fill-cell grout shall be submitted and reviewed prior to composing first batch.

2. Testing agency shall perform full time supervision for all reinforcement bar placement in masonry and all grout placement, verifying conformance to the design drawings and specifications. See Specification Section 04 105.

G. Steel Materials Testing:

1. Inspection will be made of a random selection of 15 percent of all high strength shop and field bolting. To be acceptable, 95 percent of all bolts tested shall meet design tension, and no bolt shall test to less than 85 percent of design tension. If the bolting fails to meet this requirement, bolts shall be reworked by the Contractor and additional tests of 50 percent of all bolts shall be made until the above requirements are met.
2. All inspections shall be made by a Registered Engineer or by an inspection laboratory acceptable by the Architect.
3. Inspection reports shall include certification that:
 - a. The work has been checked against the contract drawings and that full strength butt welds have been provided where they were called for on the plans.
 - b. The work has been checked against the shop drawings and full strength butt welds introduced by the fabricator have been provided.
 - c. Fillet welds and floor and/or roof deck welds have been inspected.
 - d. The welding has been accomplished to meet AWS Standards.
 - e. High strength bolts have been installed with one hardened washer and they meet the inspection requirements prescribed in the contract specifications.
4. One copy of inspection reports shall be furnished to the Architect, one to the Engineer, and one to the Contractor. Cost of such inspection shall be paid for by the Owner.

H. Not Used

I. Not Used

J. Steel Placement:

Prior to the placement of first concrete in each building pad area, the Structural Engineer and/or Architect's representative will inspect the reinforcement bar placement for correctness. Thereafter, it will be the responsibility of the General Contractor to verify correct placement of all reinforcement steel prior to covering with concrete.

K. Building System Pressure Tests:

1. Domestic Water shall hold 150 psi pressure for 30 minutes without pressure drop.

2. Fire Water shall hold 150 psi pressure for 4 hours without pressure drop.
3. Gas shall hold 50 psi pressure for 2 hours without pressure drop.
4. Sanitary/Storm Sewers shall hold 10' head for 15 minutes without pressure drop.

L. Site System Pressure Tests

1. Domestic water shall hold 150 psi pressure for 4 hours without pressure drop.
2. Fire water shall hold 150 psi pressure for 4 hours without pressure drop.

1.4 CODE COMPLIANCE TESTING

- A. Inspections and tests required by codes or legal ordinances, or by plan approval authority, shall be the responsibility of the Contractor, unless otherwise provided in the Contract Documents.

1.5 CONTRACTOR'S CONVENIENCE TESTING

- A. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

1.6 COOPERATION WITH TESTING LABORATORY

- A. Representatives of the testing agencies shall have access to the work at all times. Contractor shall provide for such access in order that the laboratory may properly perform its functions.
- B. Contractor shall notify testing agencies sufficiently in advance of operations to allow for assignment of personnel and scheduling.

1.7 TAKING SPECIMENS

- A. All specimens and samples for testing, unless otherwise provided in these Contract Documents, shall be taken by the testing laboratory. All sampling equipment and personnel shall be provided by the testing laboratory and all deliveries of specimens and samples to the testing laboratory shall be performed by the testing laboratory personnel.

1.8 DISTRIBUTION OF TEST RESULTS

Distribution from Testing Company: (One copy each)

- A. Job Site.
- B. Contractor's Office.
- C. Owner's Project Manager.

- D. Architect's Project Manager.
- E. Civil Engineer (civil work only).
- F. Structural Engineer (structural work only).

END OF SECTION

SECTION 01 500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

I. PART 1 - GENERAL

1.1 SCOPE

A. Construction facilities and temporary controls required for this work to be provided by the Contractor, include, but are not necessarily limited to:

1. Temporary utilities such as gas, water, electricity and telephone.
2. Field Office(s).
3. Sanitary Facilities.
4. Enclosures such as tarpaulins, barricades, and canopies.
5. Fencing of construction area for safety and security.
6. Parking of construction personnel vehicles.

1.2 PROTECTION

A. Use all means necessary to maintain construction facilities and temporary controls in proper and safe conditions throughout progress of work.

1.3 SAFETY

A. Contractor will be fully responsible for any damage to existing computers, printers, etc.

1.4 REPLACEMENTS

A. In event of loss or damage, Contractor shall immediately make all repairs and replacements necessary to construction facilities and temporary controls to Owner's satisfaction at no additional cost to Owner.

1.5 UTILITY HOOKUP

A. All fees for temporary utility tie-ins will be the Contractor's responsibility.

II. PART 2 - PRODUCTS

2.1 CONTRACTOR'S STAGING AREA

A. The location of job construction trailers and the materials storage area shall be determined at the pre-construction conference, and shall be within a construction fence. The Contractor shall confine his storage

therein and take necessary precautions to protect materials from all forms of damage and theft as a part of this work.

2.2 TEMPORARY UTILITIES

- A. Contractor shall furnish water, gas electricity and telephone service required during construction and extend temporary service lines to construction areas for use of all subcontractors and Owner's forces.
- B. Temporary Water
 - 1. Provide ample supply of potable water for all purposes of construction at access points convenient to personnel. Pipe water from source of supply to all points where water will be required.
 - 2. Provide sufficient heavy duty hose or PVC pipe to carry water to every required part of construction and allow use of water facilities to subcontractors engaged on work.
- C. Temporary Electricity
 - 1. All temporary electrical facilities shall be constructed and maintained in accordance with the Division of Industrial Safety "Electrical Safety Orders" (ESO), the Public Utilities Commission "Rules for Overhead Line Construction" (G.O. 95). Materials, devices, and equipment used for these facilities shall be in good and safe condition but need not be new.
 - 2. Installation of lighting and safety lights shall be in accordance with local, State and Federal applicable codes.
 - 3. Run a copper ground wire, sized in accordance with NEC, in conduit run, and bond to all steel parts, using clamps acceptable to the NEC.
 - 4. Any attachment of conduit to wood structure shall be by means of bolts or lag screws in shear. All supports shall be capable of supporting four times actual load.
 - 5. General Contractor is required to make application for temporary electric service and pay for costs for electric energy used during the course of construction and until final acceptance of work by Owner.
- D. Provide heat, ventilation, fuel and services as required to protect all personnel, work and materials and to keep humidity down to the extent required to prevent corrosion of metal and to prevent condensation, dampness and mildew which is potentially damaging to materials and finishes. In addition, provide heat and ventilation prior to and during and after the following work operations as follows:
 - 1. At all times during placing, setting, and curing of concrete, provide sufficient heat to insure heating of spaces involved to not less than 50° F.
 - 2. Twenty four hours prior to beginning of application of gypsum drywall and during setting and curing period, provide sufficient

heat to produce ambient temperature in spaces involved of not less than 55° F.

3. For period of seven days previous to placing of interior finish materials and throughout application of finish materials, provide sufficient heat to produce ambient temperature of not less than 60° F.
4. After finishing trades are completed and until date of final completion, provide ambient temperature of not less than 60° F in all finished spaces.
5. Provide ambient temperature between 55° F and 75° F, and humidity no higher than 60%, prior to delivery of finish products such as cabinetry, wood doors, etc.

E. Telephone/Communications

1. Contractor shall maintain telephone in field office for use of Architect and Owner. All expenses shall be paid for by the Contractor.
2. Contractor shall provide and pay for the telephone installation and service in the field office. Service shall be maintained for duration of project operations under this contract. Contractor shall provide 110 dB outside gongs or horns so that telephones may be heard throughout construction site, or contractor shall provide and install an electronic telephone answering machine.
3. The Contractor shall provide and install an electric fax machine with a dedicated line for 24-Hour service within the temporary field office.
4. Contractor shall have onsite E-mail sending and receiving capability for communication with Owner and Architect.

2.3 FIELD OFFICE

- A. Contractor shall provide a temporary field office building (not less than 10' x 20' in size) for use by himself, Architect and the Owner located as directed by Owner. Building shall afford protection against weather, shall have a door, at least one window and table for examination of drawings. Building shall have toilet for use by Owner and Architect, connected to sanitary sewer and water. Openings shall have suitable locks. Field offices shall be maintained full time during operation of work of contract. During cold weather months, field offices shall be suitably insulated and equipped with heating device to maintain 65 F. temperature during working hours. During warm temperature, offices shall be equipped with air conditioning device to maintain temperature of 72 F. Upon completion of work of contract, Contractor shall promptly remove buildings from premises. Contractor shall provide a locking desk, a desk chair, legal size locking file cabinet, drawing shelf, and plan rack for the use of the Owner and Architect in a securable area of the field office. One complete and updated set of drawings and specifications with all addenda and change orders posted. and a copy of all approved shop drawings shall be maintained in the office in readable condition at all times.

2.4 SANITARY FACILITIES

- A. Provide proper, adequate, sanitary facilities for use of all workers employed on project, in accordance with State and Local Health Departments.

2.5 TEMPORARY CONSTRUCTION, EQUIPMENT, AND PROTECTION

- A. Provide, maintain, and remove upon completion of work, all temporary rigging, scaffolding, hoisting equipment, ladders, barricades, lights, and all other protective structures or devices necessary for safety of workers and public property as required to complete all work of this contract.
- B. Provide all necessary protection and all barricades conforming to the standards of O.S.H.A. and requirements of Gwinnett County.
- C. Contractor shall provide chain link fencing enclosures with locking gates to protect equipment and materials.
- D. Protect all workers and equipment from power lines and maintain safe distances and protective devices as required by Industrial Safety Commission.
- E. All temporary construction and equipment shall conform to all regulations, ordinances, laws and other requirements of City, County, State and other authorities having jurisdiction, including owner's and contractor's insurance companies, with regards to safety precautions, operation, and fire hazard.
- F. Provide and maintain pumping facilities, including power for keeping excavations and structures free of accumulations of water at all times (whether from underground seepage, rainfall, drainage, or broken lines). Confine water by temporary ponding to get rid of sediment prior to discharge into storm drain.
- G. Protect work and materials to be used on project including materials which have had their title transferred to the Owner, from damage or loss due to elements, theft, vandalism, malicious mischief or other causes. Contractor shall be held responsible for such damages or losses which he shall remedy at his expense.
- H. Contractor shall be responsible for protecting existing fixtures and finishes in existing school areas to be renovated. Contractor shall be responsible for removing all dust and dirt in renovated areas from fixtures, floors, walls, etc. caused by the demolition and renovation construction process. VCT floors shall be cleaned but will not require waxing.

- I. Contractor shall locate and protect all underground and above ground utilities and maintain operation of all utilities at all times during construction operation unless written permission is obtained from the Owner for temporary utility interruptions.
- J. Contractor shall notify Owner prior to any construction operation which will cause fumes to enter the existing buildings, and shall schedule construction activities so as not to interfere with school operations.
- K. Protect existing buildings and personnel by enclosing the entire limits of construction with chain link fencing. Provide access as required to permit the normal daily operations of the school including all deliveries, bus and parking/pick-up and drop-off, student/teacher/visitor access, access to all portions of buildings on the school site. Contractor shall also maintain emergency egress from every existing exit to be used in case of fire or other emergency." Contractor shall relocate fencing during the course of the construction as necessary to accommodate phased construction.

2.6 PARKING OF VEHICLES

- A. Contractor shall assume all responsibility for parking of his and his subcontractors vehicles. "Job site parking" means an area or areas within the bounds of the property or other authorized areas to be used for parking for vehicles associated with this project. Such areas shall be designated at the preconstruction meeting.

III. PART 3 - EXECUTION

3.1 MAINTENANCE AND REMOVAL OF FACILITIES

- A. Maintain all construction facilities and temporary controls as long as needed for safe and proper completion of work.
- B. Remove all such temporary facilities and controls as rapidly as progress of work will permit or as directed by Owner, but prior to final completion.

END OF SECTION

SECTION 01 630

PRIOR APPROVALS AND SUBSTITUTIONS

I. PART 1 - GENERAL

1.1 PRODUCTS

- A. Products are specified by ASTM and/or other reference standard, and/or by manufacturer's name and model number or trade name. When specified only by reference standard, Contractor may select any product meeting this standard by any manufacturer. When several products or manufacturers are specified as being equally acceptable, Contractor shall have the option of choosing among those names. When one manufacturer's specific product is specified and other manufacturers are listed as being acceptable suppliers, the other manufacturers products must have the same basic properties as the specific product mentioned. When specifications indicate "Similar products shall be subject to architect's review", this refers to review during bidding only. Otherwise, the following substitution provisions must be observed in order to use any manufacturer not listed.

1.2 REQUESTS FOR PRIOR APPROVAL

- A. During bidding, the Architect shall consider written requests for prior approval received at least ten calendar days prior to bid date. Requests received after that time shall not be considered.
1. Contractor shall submit requests for prior approval on form attached to this section, which may be copied. Form shall be complete, accurate and legible.
 2. Blank prior approval forms are also available at most local plan centers and at the Architect's office.
 3. If proposed prior approval is accepted by Architect, such acceptance shall be set forth in an addendum. Bidders shall not rely upon accepted prior approvals made in any other manner.

1.3 SUBSTITUTIONS

- A. After the date of the Contract, the Architect may consider formal requests from the Contractor for substitution of products in lieu of those specified. Requests shall be submitted in accordance with the preceding requirements. One or more of the following conditions must also be documented as reason for substitution.
1. The substitution is required by interpretation of the building official for compliance with code requirements.
 2. The substitution is required because the specified product is unavailable.

3. The substitution is required since new information discloses the specified products will not perform properly or fit into the designated space.
 4. The substitution is required since the manufacturer or fabricator refuses to certify or guarantee performance of the specified product as required.
 5. The substitution is required since it is clear, in the judgment of the Architect, that a substitution would be substantially in the Owner's best interests in terms of cost, time and/or other considerations.
- B. With each request for substitution Contractor shall include the following:
1. Complete data substantiating compliance of proposed substitution with contract documents including:
 - a. Product identification, including manufacturer's name and address
 - b. Manufacturer's literature, including product description, performance and test data, and reference standards
 - c. Name and address of similar projects on which product was used and date of installation
 2. Itemized comparison of proposed substitution with product or method specified, noting any variance from the specified product which may result in inferior appearance, performance or installation complication
 3. Information relating to changes in construction schedule
 4. For requests submitted after bids are received, accurate cost data on proposed substitution in comparison with product or method specified, including any adjustment to the contract sum that will be provided if the substitution is accepted
- C. In submitting requests for substitution, the Contractor shall make the following personal representations:
1. Contractor has investigated proposed product and has determined that it is equal or superior in all respects to the specified product.
 2. Contractor will provide an equal or better guarantee for proposed substitution as compared to the product specified.
 3. Contractor will coordinate installation of accepted proposed substitution into the project, making any such changes as may be required for the project to be completed in accordance with the Contract Documents.
 4. Contractor waives all claims for additional costs related to proposed substitution which become apparent during or following substitution submittal process.
 5. Cost comparison data is complete and includes all related costs under the contract, but does not include:
 - a. Cost under separate contracts
 - b. Architect's/Consultant's redesign fee

6. The proposed substitution satisfies Code Official's interpretations of all applicable codes.
- D. Substitutions shall not be considered if:
1. They are indicated or implied on shop drawings or product data submittals without a formal request submitted in accordance with this Article.
 2. Acceptance will require substantial revision of contract documents.

REQUEST FOR PRIOR APPROVAL

PROJECT: _____

DATE SUBMITTED: _____

CONTRACTOR: _____

BID DATE: _____

SUB CONTRACTOR: _____

SUPPLIER: _____

SPEC SECTION: _____ PARAGRAPH: _____ TITLE: _____

	<u>PRODUCT SPECIFIED</u>	<u>PAGE NO.</u>	<u>PRIOR APPROVAL PRODUCT</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____

1. The following required information is attached:
 - A. Product identification manufacturer's name, address, telephone number
 - B. Manufacturer's literature, performance/test data, reference standard
 - C. Name/address of similar projects where product has been used and Date of Application

2. Comparison of proposed substitute product with specified product:
 - A. Differences: _____

- B. Effect on dimensions or other trades: _____

3. Comments: _____

BY _____

REQUEST FOR SUBSTITUTION AFTER BID

PROJECT: _____

DATE SUBMITTED: _____

CONTRACTOR: _____

BID DATE: _____

SUB CONTRACTOR: _____

SUPPLIER: _____

SPEC SECTION: _____ PARAGRAPH: _____ TITLE: _____

1. The following required information is attached:
 - A. Product identification, manufacturer's name, address, telephone number
 - B. Manufacturer's literature, performance/test data, reference standard
 - C. Name/address of similar projects where product has been used and Date of Application

2. Comparison of proposed substitute product with specified product:
 - A. Differences: _____

 - B. Effect on dimensions and trades: _____

3. Data related to changes in construction schedule: _____

4. Accurate cost data on proposed substitution in comparison with product specified: _____

5. Reason for request for substitution: (Check One)
 - 1) Specified product will not meet code.
 - 2) Specified product unavailable for purchase.
 - 3) Specified product will not perform or fit as required.
 - 4) Manufacturer will not provide required certification or guarantee for specified product.
 - 5) Substitution is clearly in Owner's best interest in terms of cost or schedule.

END OF SECTION

SECTION 01 700

CONTRACT CLOSE-OUT

I. PART 1 - GENERAL

1.1 CLOSE-OUT TIMING

- A. Following receipt of the Certificate of Occupancy by the General Contractor, and in accordance with Section 9.8 of the General Conditions, the Architect shall issue the Certificate of Substantial Completion when he has determined that the work or a designated portion thereof is substantially complete. Issuance of the Certificate of Occupancy is as a prerequisite to issuance of the Certificate of Substantial Completion by the Architect. The Contractor shall then prepare, assemble and transmit the items listed in paragraph 1.3 to the Architect for review and transmittal to the Owner. Unless additional quantities are specified elsewhere, submit all items in duplicate.
- B. As-built documents, maintenance materials, tools, equipment, demonstrations, data, manuals and other close-out requirements shall be submitted (or performed) and accepted by the Owner prior to date of final completion. All close-out documents shall be submitted to the Architect simultaneously. Piece meal delivery of separate elements of the documents will not be acceptable and will be returned to the General Contractor.
- C. All close out requirements must be complete before submittal of final Application for Payment, including completion of unfinished work.

1.2 PUNCH LIST

- A. When the project is substantially complete and all building systems are operating after having been tested and balanced, the Contractor shall notify the Architect in writing at least five days before the date of request for punch list inspection. The contractor must provide a copy of this punch list at that time. The Contractor shall arrange for the presence of all subcontractors whose work is involved, if required by the Architect.
 - 1. The Owner, Architect, Engineer, or their authorized representatives shall prepare a "Punch List" as a convenience to the Contractor for items not completed and work not meeting the requirements of the Contract Documents. The "Punch List" is not to be construed to be a final or complete listing of project requirements, but is intended only to assist in the completion of the project. The Contractor shall make a diligent effort to

- complete all work in conformance with the requirements of the Contract Documents before requesting a "Punch List".
2. Correction of items noted on the "Punch List" does not relieve the Contractor from conforming with all requirements of the Contract Documents.

1.3 DETAIL REQUIREMENTS

A. Maintenance/Operating Manuals

1. Three copies each of maintenance and operating manuals are required to be submitted prior to Final Payment covering all materials, products, finishes, systems, equipment, accessories, etc. included in this project. Contractor shall prepare manuals in durable plastic 3 ring, 2" binders approximately 8-1/2" x 11" in size, divided into logical sections with at least the following information:
 - a. Identification on front cover and spine stating general nature of manual and name of project.
 - b. Neatly typewritten index near front of manual, furnishing immediate information as to location in manual of all emergency data.
 - c. Complete instructions regarding operation and maintenance of all systems of the building.
 - d. Complete nomenclature of all replaceable parts, their part numbers, current costs, and name and address of nearest vendor of parts.
 - e. Copy of all guarantees and warranties required.
 - f. Copy of reviewed shop drawings with all data concerning changes made during construction.
 - g. List of all contacts for emergency and standard warranty service indicating addresses and phone numbers (and 24 hour numbers).
 - h. Wiring diagrams and recommended "turn around cycle."
2. Where contents of manuals include manufacturer's catalog pages, clearly indicate precise items included in this installation and delete or otherwise clearly indicate, all manufacturer's data with which this installation is not concerned.

B. Asbestos

1. Contractor shall submit Certificate and copies of other reports and documents relating to asbestos abatement procedures performed as required by the appropriate government agencies.
2. Certificate shall warrant that all materials, products and assemblies incorporated in this project are totally free of asbestos, PCB, or other such hazardous material. If asbestos materials are found to exist in work performed by the Contractor for this project, the Contractor shall pay for the testing above and shall replace the asbestos containing material at no cost to the Owner.

3. After date of final completion of project, Owner may elect to employ the services of an independent testing agency to test for asbestos content.
- C. Contractor shall submit original Fire Marshall's Certificates of Occupancy and original Building Department, occupancy permit from the governmental agencies having jurisdiction that the construction has been inspected as required for laws and ordinances and that the building is approved for occupancy and suitable for its intended purpose. Provide directly to the Owner via Certified mail to Mike Roszyk, Gwinnett County Public Schools, 53 Gwinnett Drive, Lawrenceville, GA 30046.
- D. Contractor shall furnish three copies of the following:
1. Consent of Surety for final payment.
 2. Final application for payment.
 3. Contractor's Statutory Affidavit ensuring no liens.
 4. Non-influence Affidavit.
 5. Subcontractor Statutory Affidavits ensuring no liens.
- E. Warranties
1. Contractor shall warrant all work executed by his forces and his subcontractors under this contract, and any additional modifications and change orders, to be absolutely free of all defects of workmanship and materials for a period of one year beginning on date of Substantial Completion. See Warranty Forms - Specifications Sections 01 740 and 01 741. Contractor shall repair all such defects, resulting damages and repair any damage to other work caused by subsequent repair work to Architect's and Owner's satisfaction no later than 30 days following written notification by Owner that remedial repairs are required.
 2. At the end of the one year warranty period, the Contractor shall inspect the project with the Owner for construction deficiencies. At that time, a correction list shall be prepared by the Owner and the Contractor shall make the necessary repairs and corrections immediately and as directed by the Owner.
 3. Contractor shall provide additional guarantees (in excess of one year) where specifically required by pertinent specification sections.
 4. Contractor shall provide three copies of all warranties.
- F. Contractor shall furnish two copies of valve tag schedules with close-out documents and mount one copy, framed under glass, on mechanical room wall.
- G. Contractor shall provide a certificate indicating that the grab bars and anchorage shall withstand a safe loading pressure of 800 pounds.

- H. Contractor shall deliver all building keys at Date of Substantial Completion. Contractor shall tag each key to indicate lock which key operates. Contractor shall accompany keys with final hardware schedule and remove all construction inserts from locksets and cylinders. Contractor shall change over door locks and other construction access provisions. Contractor shall furnish a certificate of compliance relating to all hardware installations in accordance with the requirements of Section 08710, part 1.4E.
- I. Contractor shall coordinate demonstrations and testing of all building systems for Owner's maintenance personnel and complete such demonstrations and testing prior to Date of Substantial Completion, in accordance with applicable specifications sections.
- J. Record Drawings
1. Maintain a record set of blueline prints of contract drawings, shop drawings, and specifications in a clean, undamaged condition. Mark-up the set of record documents to show the actual installation. When shop drawings are used for mark-up, record a cross reference at the corresponding location on the contract drawings. Give particular attention to concealed work that would be difficult to measure and record at a later date.
 - a. Mark record sets with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work.
 - b. Note related change order numbers where applicable.
 - c. Note change order in green erasable pencil.
 - d. Note all addenda in red erasable pencil.
 2. At time of installation, locations of all underground work, including all utility pipes and conduits, shall be recorded on blueline 24" x 36" prints by Contractor and reviewed by the Architect.
 3. Contractor shall locate and dimension all work, including stubs for future connections, with reference to permanent landmarks or buildings and indicate approximate depth of work below finish grade.
 4. All symbols and designations used in preparing as-built drawings shall match those used elsewhere in contract drawings.
 5. Upon completion of the project, these "as built" prints shall be certified as to their correctness by the signature of the Contractor and turned over to the Architect.
 6. Record Specifications: Maintain one complete copy of the Project Manual, including specifications and addenda, and one copy of other written construction documents such as change orders and similar modifications issued in printed form during construction. Mark these documents to show substantial variations in the actual work performed.
- K. Contractor shall provide maintenance and replacement stock material as required by applicable specification sections prior to date of substantial completion in accordance with the individual Specifications

Section requirements. This material includes, but is not limited to, the following:

1. One gallon of EIFS adhesive, one gallon of finish coating (per color), 20 S.F. of each type reinforcing fabric for EIFS and, 20 S.F. of insulation board for EIFS in a thickness to match that installed on the building.
2. 2% of each acoustical ceiling tile type
3. 2% additional resilient floor material and adhesives
4. All carpet scraps shall remain at the job site for the owners review. Selected carpet scraps shall be stored at the project. Remaining scraps shall be disposed of by the contractor.
5. One gallon of each type and color of paint used.

1.4 FINAL CLEANING

- A. Prior to the Date of Substantial Completion, remove all marks, stains, dust, dirt, paint drippings, etc., for all surfaces. Wash clean all glass surfaces, tile work, cabinets, hardware, plumbing, and other fixtures. Remove all temporary labels, tags, or protective coverings.
- B. Cleaning, polishing, sealing, and all other finish operations shall be performed to comply with the specified requirements prior to the date of substantial completion.
- C. Final Inspection
 1. When the work is completed in accordance with the Contract Documents and the requirements of Paragraphs A and B above and General and Supplemental Conditions have been satisfied, the Contractor shall notify the Architect, in writing, that the work shall be ready for final inspection on a definite date which shall be stated in such notice. The notice shall be forwarded to the Owner through the Architect, who will attach his endorsement as to whether or not he concurs in the Contractor's statement that the work will be ready for final inspection on the established date. Such endorsement shall not relieve the Contractor of his responsibility in this matter.
 2. Final inspection will be made by the Owner, Architect, and/or Consultants when the Contractor deems that the work has been completed in accordance with the Contract Documents and when he has requested a final inspection be made as outlined above.

1.5 Final Payment Application: Actions and submittals which must precede or coincide with submittal of Contractor's final payment application:

- A. Complete of project closeout requirements.
- B. Completion of items specified for completion beyond time of substantial completion.

- C. Completion of incomplete work.
- D. Transmittal of required project construction records to Owner.
- E. Removal of temporary facilities, services, surplus materials, rubbish, and similar elements.
- F. Change over of door locks and other Contractor's access provisions to Owner's property.

LPBC-210036

MAXWELL HIGH SCHOOL - PHASE 3D - MAIN BUILDING RENOVATION
CLOSE-OUT

01 700-8
110310

Updated information _____

SECTION	CONTRACTOR/ SUB	COMPANY	WARRANTY	LIEN REL.	O & M MAN.	ASBESTOS CERTIFICATE	STOCK	MISC.
06 240 06 400	Architectural Woodwork							
07 190	Vapor Barrier							
07 200	Insulation							
07 240	EIFS							
07 520 07 600	Roofing Sub Roofing Manufacturer		2 Year 2 Year - Counter Signed By Installer					
07 900	Joint Sealer		3 year					
08 100	Metal Doors & Frames, Metal Window Frames							
08 210	Wood Doors		Manuf. Lifetime					
08 330	Overhead Doors		2 Year					
08 410	Storefront							
08 710	Finish Hardware Supplier							
	Manuf.		5 Year - Closers					Cert. Of Compliance
08 800	Glass & Glazing		5 Year					
09 100 09 260	Metal Support Systems, Gyp Bd							

Updated Information _____

SECTION	CONTRACTOR/ SUB	COMPANY	WARRANTY	LIEN REL.	O & M MAN.	ASBESTOS CERTIFICATE	STOCK	MISC.
09 310	Ceramic, Porcelain, Quarry Tile							
09 510	Acoustical Ceilings						2% Tile	
09 650	Resilient Flooring						2% Floor Material & Adhesive	
09 685	Carpet Manf. Installer		10 Yr. Color Fasteners/ 5 Yr. Contam/Lifetime Static					
09 900	Painting		2 Year				3 Sq. Yd. Plus Scraps	
10 001	Miscellaneous Specialities		5 Years on Mirrors				1 Gal. Ea. Color	
10 100	Visual Display Boards		50 Year					
10 155	Toilet Partitions							
10 440	Signs & Numbers							
15 100	Plumbing Subcontractor							Certificate of Lead Free Solder
	Electric Water Cooler		5 Yr. Refrig. Sys.					Certificate of Lead Free Solder

CLOSE-OUT

Updated Information _____

SECTION	CONTRACTOR/ SUB	COMPANY	WARRANTY	LIEN REL.	O & M MAN.	ASBESTOS CERTIFICATE	STOCK	MISC.
15 400	HVAC Subcontractor							As-Builts
	RTU - Single Zone		5 Yr. Compressor					
15 500	Automatic Controls							Wiring Diagrams
16 100 1.08 1.09	Electrical Subcontractor							As-Builts
16 100	Energy Management Systems							
16 150	Fire Alarm							Wiring Diagrams Certification Letter
16 200	MATV							Wiring Diagrams Certification Letter
16 300	Intercom							Wiring Diagrams Certification Letter

SECTION 01 710

CLEANING

I. PART 1 - GENERAL

1.1 SCOPE

- A. Throughout all phases of the construction period, maintain the building and site in a standard of cleanliness as described in this Section.

1.2 RELATED WORK

- A. In addition to standards described in this Section, comply with all requirements for cleaning as described in other Sections of these Specifications.

1.3 QUALITY CRITERIA

- A. The Contractor shall conduct daily inspections, and more often if necessary, to verify that requirements of cleanliness are met.
- B. In addition to the standards described in this Section, comply with all pertinent requirements of Governmental agencies having jurisdiction.
- C. Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer systems or into streams or waterways is not permitted.

II. PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

- A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the surfaces.

III. PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General

- 1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection of materials.
- 2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for the construction of this work.

3. Twice weekly, and more often if necessary, EACH SUBCONTRACTOR shall completely remove all scrap, debris, and waste material from the job site, and shall place into container furnished by the General Contractor.
4. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection.

B. Project Site

1. The Contractor shall:
 - a. Daily, and more often if necessary, inspect the project site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
 - b. Weekly, and more often if necessary, sweep all interior places clean. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by reasonable diligence using a hand-held broom.
 - c. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
 - d. Following the installation of finish floor materials, protect by covering with temporary coverings and/or clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials have been installed. "Clean" for the purpose of this subparagraph, shall be interpreted as remaining free from all foreign material, which in the opinion of the Owner's representative, may damage the finish floor material.

3.2 FINAL CLEANING

- A. Except as otherwise specifically provided, "Clean" (for the purpose of this Article) shall be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance equipment and materials.
- B. Prior to completion of the work, remove from the job site all tools, temporary structures, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.
- C. Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains, and dirt from finished surfaces. Use only the specified cleaning materials and equipment.
- D. Repair, patch, and touch-up marred or damaged surfaces to match adjacent finishes.
- E. Clean the following:
 1. Plumbing fixtures.
 2. Light fixtures and lamps.

3. Filters of ventilating equipment when units have been operating during construction; in addition, clean grilles and louvers.
 4. All electrical panels.
 5. Clean all glass and mirrors.
- F. To all surfaces requiring the routine application of protective waxes and/or buffed polish, apply the specified coating and/or polish as recommended by the manufacturer of the material being treated.
- G. Clean areas traversed by construction personnel.
- H. Maintain cleaning operations until the building, or portion thereof, is accepted by the Owner.
- I. Schedule final cleaning to be approved by the Owner's representative to enable the Owner to accept a completely clean project.

END OF SECTION

CONTRACTOR WARRANTY FORM

PROJECT:

LOCATION:

OWNER:

We _____, Contractor, performing work under

(Company name)

Specification Sections(s)_____for the above referenced project, do hereby

(list appropriate Spec Section)

warrant that all labor and materials furnished and work performed by this company are in accordance with the Contract Documents and authorized modifications thereto, and will be free from defects due to defective materials or workmanship for a period of one (1) year from Date of Substantial Completion. This warranty commences at 12:00 noon on_____and expires at 12:00 noon on _____. Should any defect develop during the warranty period commencement date due to improper materials, workmanship or arrangement, the same shall, upon written notice by the Owner, be made good by the undersigned at no expense to the Owner.

Nothing in the above shall be deemed to apply to work which has been abused or neglected by the Owner.

DATE: _____ FOR: _____

(COMPANY NAME)

BY: _____

TITLE: _____

SUBCONTRACTOR WARRANTY FORM

PROJECT:

LOCATION:

OWNER:

GENERAL CONTRACTOR:

We _____, Subcontractor
(Company Name)

for _____, as described in Specification Section(s)
(list trade)

_____do hereby warrant that all labor and materials furnished
(list appropriate Spec Sections)

and work performed in conjunction with the above referenced project are in accordance with the Contract Documents and authorized modifications thereto, and will be free from defects due to defective materials or workmanship for a period of one year from Date of Substantial Completion.

This warranty commences at 12:00 noon on _____ and expires at 12:00 noon on _____. Should any defect develop during the warranty period due to improper materials, workmanship or arrangement, the same shall, upon written notice by the Owner, be made good by the undersigned at no expense to the Owner.

Nothing in the above shall be deemed to apply to work which has been abused or neglected by the Owner.

DATE: _____

FOR: _____
(COMPANY NAME)

BY: _____

TITLE: _____

LPBC-210036 CERTIFICATE OF THE CONTRACTOR/SUBCONTRACTORS 01 742 -1
STATUTORY AFFIDAVIT

CERTIFICATE OF THE CONTRACTOR / STATUTORY AFFIDAVIT

TO: Forsyth County Board of Education

Contract entered into the _____ day of _____, between the above mentioned parties for the construction of:

KNOW ALL MEN BY THESE PRESENTS:

1. The undersigned hereby certifies that all work required under the above contract has been performed in accordance with the terms thereof, that all material men, subcontractor, mechanics, and laborers have been paid and satisfied in full, and that there are no outstanding claims of any character (including disputed claims or any claims which the contractor has or will assert and defense) arising out of the performance of the contract which have not been paid and satisfied in full except as listed herein below:

2. The undersigned further certifies that to the best of his knowledge and belief there are no unsatisfied claims for damages resulting from injury or death to any employees, subcontractors, or the public at large arising out of the performance of the contract, or any suits or claims for any other damage of any kind, nature, or description which might constitute a lien upon the property of the owner.

3. The undersigned makes this affidavit for the purpose of receiving final payment in full settlement of all claims against the owner arising under or by virtue of the contract, an acceptance of such payment is acknowledged as a release of the owner from any and all claims arising under or by virtue of the contract.

Signed this _____ day of _____, 20____

(Signature)

(Title)

(Firm)

COUNTY OF _____ STATE OF _____ Personally before me, the undersigned authority, appeared _____, who is known to me to be an official of the firm of _____. Who, after being duly sworn, stated on his oath that he had read the above statement and that the same is true and correct.

(Notary Public)

My commission expires: _____

NON-INFLUENCE AFFIDAVIT

COUNTY OF _____

STATE OF GEORGIA

I do solemnly swear on my oath that as to the Contract dated _____
20____, between _____

Contractor

and the Gwinnett County Board of Education, I have no knowledge of the exertion of any influence or the attempted exertion of any influence on the firm on behalf of which this Affidavit is made in any way, manner, or form in the purchase of materials, equipment, or other items involved in the construction, manufacture, or employment of labor under the aforesaid contract, by any member of the Georgia Education Authority (Schools) or any employee of the Georgia Education Authority (Schools) or any member of the Local Board of Education or any employee of the Local Board of Education, or any person connected with the State Government of Georgia in any way whatsoever.

This _____ day of _____, 20_____.

BY: _____
Signature

Title

Firm

County of _____

State of Georgia

Personally before me, the undersigned authority, appeared _____,
who is known to me to be an official of the _____
_____, who,

Contractor

after being duly sworn, stated on his oath that he had read the above statement and that the same is true and correct.

Notary Public County, Georgia

My Commission Expires: _____

This day of _____, 20_____

SECTION 01 744

IMMIGRATION AND SECURITY FORMS

GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT OF 2006:

As of July 1, 2009 all Contractors and Subcontractors working on GCPS and public projects were required to comply with the Georgia Security and Immigration Compliance Act of 2006. The requirement was implemented in the State of Georgia as SB 529. As part of this program all General Contractors, Subcontractors, and any other Contractors working for a public agency must verify the work eligibility of all newly hired employees through an electronic federal work authorization program.

All required parties must register in the Employment Eligibility Verification (EEV)/Basic Pilot Program which is operated by the U.S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security. This program can be accessed at <https://www.vis-dhs.com/EmployerRegistration>.

GCPS will require full compliance on all new projects as well as projects currently under construction. This compliance includes providing GCPS with copies of Affidavits from all General Contractors and Subcontractors.

Contractor Affidavit and Agreement (Example)

CONTRACTOR AFFIDAVIT AND AGREEMENT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual, firm, or corporation which is contracting with (name of public employer) has registered with and is participant in a federal work authorization program* [any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603], in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

The undersigned further agrees that, should it employ or contract with any subcontractor(s) in connection with the physical performance of services pursuant to this contract with (name of public employer), contractor will secure from such subcontractor(s) similar verification of compliance with O.C.G.A. 13-10-91 on the Subcontractor Affidavit provided in Rule 300-10-01-.08 or a substantially similar form. Contractor further agrees to maintain records of such compliance and provide a copy of each such verification to the (name of the public employer) at the time the subcontractor(s) is retained to perform such service.

EEV / Basic Pilot Program* User Identification Number

BY: Authorized Officer or Agent
(Contractor Name)

Date

Title of Authorized Officer or Agent of Contractor

Printed Name of Authorized Officer or Agent

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE

_____ DAY OF _____, 20____

Notary Public

My Commission Expires:

*As of the effective date of O.C.G.A. 13-10-91, the applicable federal work authorization program is the "EEV/Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

(End of Form)

Subcontractor Affidavit and Agreement (Example)

SUBCONTRACTOR AFFIDAVIT

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual, firm, or corporation which is engaged in the physical performance of services under a contract with (name of contractor) on behalf of (name of public employer) has registered with and is participating in a federal work authorization program* [any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603], in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

EEV / Basic Pilot Program* User Identification Number

BY: Authorized Officer or Agent
(Contractor Name)

Date

Title of Authorized Officer or Agent of Contractor

Printed Name of Authorized Officer or Agent

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE

DAY OF _____, 20____

Notary Public
My Commission Expires:

*As of the effective date of O.C.G.A. 13-10-91, the applicable federal work authorization program is the "EEV/Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

(End of Form)

END OF SECTION

SECTION 02 050

EXTERIOR DEMOLITION

PART 1 - GENERAL

1.01 SCOPE

- A. Work described in this section includes demolition and removal of any existing built site construction, utilities, utility appliances, appurtenances; capping of existing utilities; removal and return of any and all utility meters that belong to Gwinnett County Water & Sewer; and all incidental items necessary to provide a condition suitable to construct the full scope of improvements illustrated and/or implied on the Drawings for Maxwell High School Phase 3-D - Main Building Renovation.
- B. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this Section.
- C. The Contractor is solely responsible for the scope of Demolition required to build the entirety of new construction illustrated or implied on the Drawings. Ascertain the entire scope of Demolition by whatever means necessary and include the cost for same in the Contract Sum. Specific items illustrated on the drawings could include, but not necessarily limited to, concrete sidewalks, curb and gutter, concrete ramps, asphalt drives, and existing road/vehicular surfaces. The Contractor shall verify the quantity, location and condition of existing built items to be demolished, removed or modified; and will include these verified quantities in his bid.
- D. Render all areas where improvements are illustrated or implied to be built, clear of debris and free of demolished remnants and debris and other items or conditions which might have a deleterious effect on the continued construction of the project
- E. By submittal of his bid, the Contractor acknowledges that he understands the entire scope of Demolition and removal necessary to complete new construction.
- F. Refer to sheet C100 - Demolition Plan for approximate location of existing vegetation to be removed concurrently with other Demolition operations.
- G. Become thoroughly familiar with all existing conditions at the Project site, the drawings, specifications, County and State Regulations and Ordinances to fully ascertain the scope of work illustrated and/or implied on the Drawings.
- H. Visit the site to inspect existing conditions on the Project site prior to formulating bid.
- I. The Owner, Architect/Engineer do not guarantee that all the existing utilities are illustrated on the Drawings. Locate and verify all horizontal and vertical locations of all existing utilities at no expense to the Owner. In the event that there are, in the opinion of the Contractor, items for demolition not illustrated on the Plans, he shall notify the Architect in writing during the Bid Phase of the Project. The Architect and his Consultants shall evaluate any such information and shall respond as feasible during the Bid Phase of the Project.

- J. Related Work Specified Elsewhere:
 - 1. Reference Section 02 220 Earthwork.
 - 2. Reference Section 02 270 Erosion, Sediment and Pollution Control.

1.02 PROJECT CONDITIONS

- A. Traffic:
 - 1. Conduct Demolition operations and removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.
 - 2. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the governing authorities and Owner.
 - 3. Provide alternate routes around closed or obstructed vehicular or pedestrian traffic ways as required.
- B. Use of explosives will not be permitted, except with written permission of Architect and Owner.
- C. Promptly repair damages caused to items to remain by Demolition operations at no additional cost to Owner.
- D. If asbestos is encountered or suspected, Contractor shall notify the Architect and proper authorities before proceeding.
- E. Site shall be rendered obstruction free, whether obstructions (utility poles, guy wires etc.) are noted on the drawings or not.
- F. Provide all temporary traffic control and traffic safety devices including but not limited to barricades, signage, signal lights, and/or flagmen to protect the public at large, and all Contractor's personnel while operating within public streets and/or rights-of-way.

1.03 EROSION, SEDIMENT AND POLLUTION CONTROLS

- A. Furnish and install Erosion Sediment and Pollution Control Measures prior to or concurrent with Demolition operations. Reference the Drawings and Section 02 270 of these Specifications.
- B. Use water sprinkling, temporary enclosures and other suitable methods as necessary to limit the amount of dust and dirt rising and scattering in the air, to the lowest level of air pollution practical for the condition of work. Comply with the governing regulations.
- C. Follow and implement all local, state and federal regulations germane to Demolition operations or any resultant erosion, sediment and pollution control measures.

PART 2 - PRODUCTS

2.01 MATERIALS TO BE REUSED

- A. Handle and store materials to be disassembled and reused in such a manner so as to prevent damage. Repair or replace damaged materials at no cost to Owner. Fasteners, fittings and brackets related to materials to be reused shall, if not salvageable in first-class condition, be replaced at no cost to Owner.

2.02 MATERIALS TO BE REMOVED

- A. Materials to be disassembled and not reused shall be treated as "waste" and disposed of by Contractor. In addition:
 - 1. Burning of waste on site shall not be permitted.
 - 2. Waste materials shall become the property of the Contractor and shall be promptly removed from site. Storage or sale of salvageable items on site shall not be permitted. Disposal of said materials shall be done so legally.
 - 3. Do not store waste in planted or tree save areas or any area that can be damaged by storage operations.

PART 3 - EXECUTION

3.01 EXTERIOR DEMOLITION

- A. Structures
 - 1. Structures indicated to be removed shall be moved off Owner's property or demolished with debris removed from site.
 - 2. Owner assumes no responsibility for actual condition of existing structures.
 - 3. Scope of Demolition includes all coordination with Owner for removal of all incidental appurtenances found on the site.
- B. Demolish and/or remove any encountered foundations, footings, asphalt pavement, walls, piping, concrete slabs, septic tanks, water wells, vaults and/or other below-grade construction interfering with new construction.
- C. Remove any remnant asphalt, concrete slabs, curbs, walks, concrete and masonry walls, posts, poles, fences and other demolished materials from site unless otherwise specifically indicated on the Drawings or elsewhere in these Specifications.
- D. Any voids below grade caused by demolition of structures, or below-grade construction shall be filled as specified in Earthwork - Section 02 200. Consult the Geotechnical Engineer for assessment of existing conditions and recommendations prior to proceeding and provide report to Architect prior to proceeding.
- E. Utilities
 - 1. Disconnect and seal off utilities serving any structures to be demolished prior to start of Demolition.
 - 2. Utilities shall be disconnected below existing grade level by representatives of public utility being disconnected.
 - 3. Do not interrupt utility service to existing adjacent occupied facilities except as required and approved by public utility company and Owner.
- F. Clearing and removal of trees include complete removal of the root systems of those trees to be removed.

3.02 PROTECTION

- A. Limit Demolition operations to those items required to provide a condition suitable to construct the full scope of improvements illustrated and/or implied on the Drawings for new construction.
- B. Protect and prevent damage to existing construction to remain. Repair and/or replace, at the expense of the Contractor, any and all damage to any of the Owner's property or any adjacent or nearby property Owner's possessions in kind that are to remain.

3.03 OTHER

- A. See Mechanical, Plumbing and Electrical drawings and specifications for any additional utility demolition requirements.

3.04 QUALITY CRITERIA

- A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed demolition Work similar to that indicated for this Project.
- B. Any and all asbestos removal shall be conducted by an experienced, licensed firm in accordance with all applicable local, state and federal regulations.

End of Section

SECTION 02 060

INTERIOR DEMOLITION

I. PART 1 - GENERAL

1.1 SCOPE

- A. Work described in this section includes demolition and removal of existing built construction, utilities, utility appliances, appurtenances and all incidental items necessary to provide a condition suitable to construct the full scope of improvements illustrated and/or implied on the Drawings for new construction.
- B. The Contractor is solely responsible for the scope of demolition required to build the entirety of new construction illustrated or implied on the Drawings. Ascertain the entire scope of demolition by whatever means necessary and include the cost for same in the Contract Sum. The cost of all said demolition whether illustrated on the Drawings or not shall be included in the Contract Sum.
- C. By submittal of his bid, the Contractor acknowledges that he understands the entire scope of demolition and removal necessary to complete new construction.

1.2 PROJECT CONDITIONS

- A. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the governing authorities and Owner. Provide alternate routes around closed or obstructed vehicular or pedestrian traffic ways as required.
- B. Use of explosives will not be permitted, except with written permission of Architect and Owner.
- C. Promptly repair damages caused to items to remain by demolition operations at no additional cost to Owner.
- D. All costs related to the removal, relocation, replacement and/or rerouting of any and all existing utilities or other built, stored, stockpiled items of any kind, surface or subsurface is the responsibility of the contractor and will be included in the Contract Sum.
- E. If asbestos is encountered or suspected, Contractor shall notify the Architect before proceeding. Asbestos abatement shall be the responsibility of the Owner.

II. PART 2 - PRODUCTS**2.1 MATERIALS TO BE REUSED**

- A. Materials to be disassembled and reused shall be handled and stored in a manner and placed so as to prevent damage. Damaged materials shall be repaired or replaced at no cost to Owner. Fasteners, fittings and brackets related to materials to be reused shall, if not salvageable in first-class condition, be replaced at no cost to Owner.

2.2 MATERIALS TO BE REMOVED

- A. Materials to be disassembled and not reused shall be treated as "waste" and disposed of by Contractor. In addition:
 - 1. Burning of waste on site shall not be permitted.
 - 2. Waste materials shall become the property of the Contractor and shall be promptly removed from site. Storage or sale of salvageable items on site shall not be permitted.
 - 3. Do not store waste in planted areas or any area that can be damaged by storage operations.

III. PART 3 - EXECUTION**3.1 INTERIOR DEMOLITION**

- A. Remove completely materials as indicated on drawings. Edges of demolished areas shall be suitable to accept neat installation of new construction or finishes. General demolition shall include removing ductwork, air devices, lights, electrical conduit, wiring, plumbing fixtures and associated piping, concrete slabs, masonry walls, doors, windows, frames, flooring, ceilings.
- B. Coordinate interruption of utility service with Owner, building inhabitants and utility companies. Obtain required approvals; comply with utility company regulations and building codes requirements.
- C. Contractor shall be responsible for patching all holes, sanding or grinding smooth and painting all floors/walls/ceilings damaged in the course of demolition and generally repair disturbed areas to original condition.
- D. Ceiling tiles and/or grid to remain necessary to be removed to access above ceiling work shall be removed and reinstalled, or replaced if damaged, after completion of work.

3.2 FLOOR GRINDING AND LEVELING

- A. Contractor shall use leveling compound such as Leveltite or Levelastic to level subfloor smooth so as to receive finish flooring (sealer, VCT or carpet).

- B. Diamond grind Lab floors smooth where shown on plans. Remove all existing sealer, grease, paint and other deleterious material that would prevent adhesion of new sealer.

3.3 PROTECTION

- A. Protect and prevent damage to existing construction to remain.

3.4 OTHER

- A. See Mechanical, Plumbing and Electrical Drawings and Specifications for additional utility demolition requirements.

END OF SECTION

SECTION 02 200

EARTHWORK

PART 1 - GENERAL

1.01 SCOPE

- A. Contractor to furnish all labor, materials, equipment and incidentals required to perform all excavation, backfill, fill and grading required to complete the work as illustrated on the Drawings and as specified herein
- B. Do not commence any excavations required in the vicinity of any existing buildings or Project until all available existing plans at Owner's office at 53 Gwinnett Drive, Lawrenceville, Georgia 30045 have been reviewed with the Architect and the Owner's Construction Coordinator.
- C. Notify free underground utility locator service at 1-800-282-7411 before any excavations are begun.
- D. Work includes but is not limited to:
 - 1. Clearing and Grubbing:
 - a) Clearing and Earthwork equipment movement shall be limited to areas designated on the Drawings.
 - b) Do not disturb the existing terrain or existing vegetation outside the designated work area(s).
 - c) All debris from clearing and/or grading operations (cleared vegetative matter, trees, root systems, remnant chipped material, stumps, etc.) shall be removed from the site, unless specifically directed otherwise by the Owner.
 - d) At the Owner's sole discretion finely chipped vegetative matter may be utilized as mulch for slope protection.
 - 2. Cutting, filling and backfilling.
 - 3. Rough and Finish Grading of site to create surfaces on the Project site as illustrated on the Drawings.
 - 4. Topsoil stockpiling, excavation, redistribution and/or importation for respread.
 - 5. Furnish, place and compact any additional material necessary to bring existing grades to new grades.
 - 6. Engineering and execution of shoring and bracing of any closely adjacent buildings and structures.
 - 7. Engineering and Shop Drawings for alternate Grading schemes of any nature.
 - 8. Excavation, removal and replacement of unsuitable soil materials as described herein.
 - 9. Rock removal as described herein.
- E. By submittal of his bid, the Contractor certifies that all means, methods, labor, equipment and materials to complete the satisfactory construction of the Project is included in the contract sum of his bid.
- F. Related Work Specified Elsewhere:

1. Reference Section 02 050, Demolition
2. Reference Section 02 270, Erosion, Sediment and Pollution Control.

1.02 PROJECT CONDITIONS

- A. Visit the site to become thoroughly familiar with all existing condition prior to formulating bid.
- B. Contractor may, at his own expense and prior to bidding, make any soil surveys and investigations he may feel necessary. Obtain authorization of Owner, through Architect, prior to start of boring or subsurface investigations.
- C. Survey and establish all property lines, property monumentation, clearing boundaries, and existing grades and lay out grade stakes for structures and appurtenances. If existing grades are at variance with Drawings, Contractor shall promptly notify Architect and receive instructions prior to proceeding any further with the work. Contractor shall be fully responsible for conditions resulting from his failure to do so. Contractor shall utilize a Registered Land Surveyor currently registered to practice land surveying in the State of Georgia.
- D. Upon becoming aware of subsurface or latent physically changed conditions differing from those illustrated on the drawings, promptly notify the Owner and the Architect verbally to permit verification of the conditions, and follow immediately in writing, regarding the nature and extent of the differing conditions. No claim by the Contractor for any conditions differing from those anticipated in the Drawings and Specifications shall be allowed, unless the Contractor has so notified the Owner, verbally and in writing, as required above, of such changed conditions.
- E. Unsuitable materials, including all forms of rock, debris, organic materials and poor soils, encountered may be redistributed to other areas of the site not to be used in a structural capacity rather than being hauled off site if and only if approved in writing prior to any on-site distribution at the Owner's sole discretion.
- F. Contractor is solely responsible for all earth quantities and to render the finished grade elevations of the Project as indicated on the Drawings. Include any exportation (i.e. "haul-off") of "excess" earth; or importation (i.e. "haul-in") of suitable earth in the Bid unless provided for otherwise in this Specification or as otherwise directed by Architect/Engineer.
- H. Prior to commencement of Earthwork operations:
 1. Survey, establish and protect bench marks, monuments and clearing boundaries. If any are disturbed or destroyed, replace in original position using a Georgia Registered Land Surveyor at no additional cost to the Owner.
 2. Protect areas outside limits of construction from encroachment by construction personnel or equipment regardless of property ownership. Erect wooden post and orange safety fencing warning signs and other protective measures and warn the public of ongoing construction activities at limits of and a reasonable distance from the construction. Off-Site access shall be by specific written permission or easement only.
 3. Construct 4'-0" high wooden post and perforated orange vinyl fencing around individual or groups of trees and shrubs designated to be preserved on the Drawings. Barricades shall be located at the drip-line of trees. Protect tree root systems from damage due to construction materials, construction operations, compaction and erosion.

4. No Clearing or any form of construction or other disturbance (including materials storage), shall be conducted outside the approximate limits of construction or inside the limits of Tree Save Areas illustrated on the Drawings without express written consent of the Owner. Existing trees and terrain outside construction limits shall not be disturbed, unless so indicated on the Drawings..
 5. All utilities to be located and marked. Horizontal and vertical location of all utilities are to be verified by the Contractor and marked on "as-built" Drawings if they are to remain. Contact the Utility Protection Center at 1-800-282-7411 not less than three (3) working days prior to grading operations. Protect existing facilities, utilities and adjacent property. Prevent ponding or washing of water on site and over adjacent property. Erect erosion control measures (e.g. silt fences) called for on the Drawings and as required to suit earth operations runoff.
 6. Provide all necessary shoring, sheeting and bracing for the protection of work and safety of personnel. The Contractor shall engage a Georgia Registered Engineer highly skilled in the design of such shoring and bracing systems to perform the design engineering for said shoring and bracing. Backfill loads shall not be imposed on walls and structural systems until those systems are completely developed and at design capacity.
 7. Protect adjacent and downstream properties from soil erosion. Comply with all erosion and sediment control measures specified elsewhere and required by applicable codes and ordinances.
 8. Protect finished paved, grassed and treed areas from construction debris and dirt.
 9. Provide traffic protection by means of suitable signs, barricades and lights in accordance with the latest edition of the Manual of Traffic Control Devices (MUTCD).
 10. Burning of debris on the Project site will not be permitted.
- I. Provide dewatering and drainage as needed to accomplish the work required in this section. No excavation may proceed until suitable dewatering has been provided and approved by the Architect/Engineer/Geotechnical Engineer and the Owner. Contractor shall take care to ensure that there shall be no areas of ponding water. In the event that ponding of water does occur, Contractor shall immediately take the necessary measures to eliminate said ponding. Submit dewatering procedures to Architect for review. All dewatering shall be included in the Contract Sum.
- J. Comply with rules and regulations governing respective utilities.
- K. Protect downstream properties from encroachment or damage from increased or concentrated storm water flows, erosion, sediment or pollutants.
- L. Claims for "lost revenue" from unsuitable materials will not be considered for payment or compensation by the Owner to the Contractor.

1.03 QUALITY CRITERIA

- A. Performed work in accordance with applicable codes and ordinances and with requirements of authorities having jurisdiction. All work under this Section will conform to:
1. Applicable OSHA rules and regulations.
 2. Latest edition of the Gwinnett County Development Regulations.
 3. For excavation, trenching and related sheeting, bracing, etc: OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P); State of Georgia and Gwinnett County

requirements. Where conflict between OSHA, the State regulations and the County regulations exists, the more stringent requirements shall apply.

- B. Employ a Georgia Registered Engineer or Georgia Registered Land Surveyor experienced in reading Architectural and Engineering Drawings, using measuring devices and tape, and skilled in the use of surveying equipment necessary to perform layout, survey, establish benchmarks and monumentation of all work required by the Drawings.
- C. Earthwork monitoring and testing shall be performed by a Georgia Registered Geotechnical Engineer, selected and paid for by the Owner.
- D. Excavation, backfilling and compaction shall comply with the following Reference Standard Designations by the American Society for Testing Materials (ASTM), or as otherwise noted on the Drawings or in the Geotechnical Report provided by the Owner and/or the Architect/Geotechnical Engineer.
 - 1. ASTM C136-76 - Sieve or Screen Analysis of Fine and Coarse Aggregates
 - 2. ASTM D1556-64 (1974) - Density of Soil in Place by the Sand-Cone Method
 - 3. ASTM D698 - Standard Proctor Compaction Test
 - 4. ASTM D2167 (1972) Density of Soil in Place by the Rubber Balloon method
 - 5. ASTM D2487-69 (1975) - Classification of Soils for Engineering Purposes
 - 6. ASTM D2922-78 - Density of Soil and Soil Aggregate in Place by Nuclear Methods
 - 7. ASTM D2937-71 - Density of the Soil in Place by the Drive- Cylinder Method

1.04 NOTIFICATION

- A. Notify Architect and Geotechnical Engineer 24 hours prior to commencing any grading, excavation, land clearing and removal operations.
- B. Notify all Utilities Companies in ample time for necessary measures to be taken to prevent interruption of service when utility lines which are to be removed, relocated and or severed are encountered.
- C. Contact the Utility Protection Center at 1-800-282-7411 not less than three (3) working days prior to any grading operations.

1.05 SUBMITTALS

- A. Submit detailed Shop Drawings and schematic diagrams as necessary to graphically describe all Shoring and Bracing procedures. Include calculations and schedules. Illustrate sequencing of all Shoring and Bracing.
- B. Submit a detailed time schedule of all Earthwork operations to the Architect/Geotechnical Engineer for review prior to commencing work.
- C. In the event that a deviation from the Earthwork Design Concept is contemplated, submit detailed Shop Drawings that clearly illustrates the intent and scope of any such deviation(s) for review and approval prior to proceeding.

PART 2 - PRODUCTS**2.01 TOPSOIL**

- A. Topsoil consists of local, fertile, friable, natural soil of loamy character, free of clay lumps, stones in excess of one inch (1") in greatest dimension, typical of Project locality, and containing no chemicals harmful to plant growth.

2.02 UNSUITABLE SOIL

- A. Unsuitable soil materials consists of soil materials not capable of being compacted to density required; rock material, as defined in Paragraph 2.09 of this Section, larger than three inch (3"), debris and organic material including muck, which is a wet organic material which cannot support a light crawler tractor type of equipment and requires removal by power shovels or draglines; or material otherwise identified and designated as unsuitable by the Geotechnical Engineer.
- B. Non-organic materials considered unsuitable include non-organic debris not capable of being compacted to density required, including but not limited to, metal objects such as appliances, metal fencing, tires, etc.. contractor shall remove and legally dispose of such items offsite and cost of removal and disposal shall paid for by Change Order.
- C. Spread and permit to dry in a area designated by the Architect any soil material which is too wet to permit the specified compaction but is still suitable to be used in a structural capacity based on the recommendations of the Geotechnical Engineer. Assist drying by discing, harrowing or pulverizing until the soil moisture content is reduced to the specified value.
- D. Only excavation of soils, which is wet due to concealed condition, including, but not limited to underground springs, high water table and leaking pipes, will be addressed as a potential additive change order. Dry and reuse suitable materials which are wet due to precipitation at no additional cost to the Owner.

2.03 FILL

- A. Satisfactory fill material consists of local, clean, non-active, organic free subsoil, free from debris, roots, topsoil and frozen material and capable of being compacted to the density required.
- B. Maximum size of rock fragments shall be equal to or less than three inches(3") in the greatest dimension.
- C. In areas of massive fills or disposal pits, the Geotechnical Engineer shall determine the maximum size of rock.
- D. Materials classified as SM, SP, ML, SC or CL are suitable for structural fill. Generally, residual soils in the local area are suitable for reuse as structural fill provided that they meet the following criteria and shall be well graded within the following limits:

1. Common fill shall consist of mineral soil substantially free from organic materials, loam, wood, trash and other objectionable materials which may be compressible or which cannot be properly compacted. Common fill shall not contain stones larger than three inches (3") in the largest diameter and shall have a maximum of 75% passing the No. 40 sieve and a maximum of 20% passing No. 200 sieve. Common fill shall not contain granite blocks, broken concrete, masonry rubble or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling. Soil excavated from the structural areas and which meets the above requirements may be used in embankments.
 2. Screened gravel shall meet the requirements of Section 806.02 of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
 3. Partially weathered rock or rock no larger than three inches (3") in any dimension, may be used as fill as provided for in the Geotechnical Report.
 4. Soil should exhibit a plasticity index of less than 30 and a dry unit weight of at least 90 pcf unless more stringent requirements are given in the Geotechnical Report, in which case they will govern.
- E. Residual material to be used as fill material shall be tested and approved by Geotechnical Engineer for degree of compaction specified for its intended use.
- F. For fill soils to be imported, the Contractor is responsible to provide samples of same for laboratory testing by the Geotechnical Engineer to determine their Standard Proctor.
- G. Contractor shall identify the location of any "borrow pits" so that the Geotechnical Engineer may inspect same to determine suitability of the general soils which the Contractor intends to import to the Project site.

2.04 GRAVEL

- A. All stone for Gravel Fill shall meet the quality requirements of Section 800 of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
- B. Gravel fill shall consist of sound, durable rock, free from injurious amounts of coatings of any kind and shall be graded so 100% passes the 1-½" sieve, 95-100% passes the 1" sieve, 25-60% passes the ½" sieve, 0-10% passes the No.4 sieve and 0-5% passes the No.8 sieve.

2.05 CRUSHED STONE (CRUSHER RUN)

- A. All stone for Crushed Stone shall meet the quality requirements of Section 800 of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
- B. Crushed stone shall consist of sound durable particles of crusher run rock, 100% passing a two inch sieve, 97-100% passing a 1½ inch sieve, 60-95% passing a ¾ inch sieve, 25-50% passing a No. 10 sieve, 10-35% passing a No. 60 sieve, and not more than 7-15% passing a No. 200 sieve and free from unsuitable materials.

2.06 GRANULAR BEDDING

- A. All stone for Granular Bedding shall meet the quality requirements of Section 800 of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
- B. Granular bedding and backfill material shall consist of a granular soil, sand, chert, crushed stone or mixture of these, all of which passes a 3/4 inch sieve, 80% passing a 3/8 inch sieve, 40% passing a No.4 sieve, 10% passing a No. 8 sieve, and not more than 5% passing a No. 16 sieve. Material shall be free of organic matter and debris.

2.07 RIP RAP

- A. Stone for Rip Rap shall meet the quality requirements of Section 805 Rip Rap of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
- B. Stone Dumped Rip Rap shall be processed in such a manner as to produce a quarry run material including rock fines which meet the gradation for the following two (2) types:

Type 1: For severe drainage conditions the largest piece of material shall have a maximum approximate value of two cubic feet. At least 35% of the mass shall be comprised of pieces which weigh 125 pounds or more.

Type 3: For general use normal drainage conditions the largest pieces of material shall have a maximum approximate value of one cubic foot. At least 35% of the mass shall be comprised of pieces which weigh fifteen (15) pounds or more.

The remainder of Types 1 or 3 shall be well-graded down to the finest sizes. Rock fines shall comprise a maximum of 10% of the total mass. Rock fines are defined as material passing a No. 4 sieve.

- C. Stone for Plain Rip Rap shall be sound, durable pieces and shall be resistant to the action of air and water. Flat, slabby and shaley pieces are not acceptable. It shall be clean and essentially free of rock dust and fines. The material shall be processed such that the largest pieces have a volume of not more than two (2) cubic feet and not more than 10% of the total weight of rip rap shall consist of spalls passing a five (5) inch sieve.

2.08 GRADED AGGREGATE BASE

- A. All stone for Graded Aggregate Base shall meet the quality requirements of Section 815 of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
- B. Graded Aggregate Base material shall conform to the following: 100% passing a two inch sieve, 97-100% passing a 1½ inch sieve, 60-95% passing a ¾ inch sieve, 25-50% passing a No. 10 sieve, 10-35% passing a No. 60 sieve, and not more than 7-15% passing a No. 200 sieve and free from unsuitable materials.

2.09 ROCK

- A. Rock consists of three types: Rippable Weathered Rock, Mass Rock and Trench Rock. Rippable Weathered Rock is considered part of the work, and shall be included in the Contract Sum. Payment for Mass Rock and Trench Rock removal shall be in accordance with change order procedures based on the unit costs provided in the Contract or a time and material basis as agreed to prior to commencing work. Rock quantities shall be qualified and quantified by the Geotechnical Engineer and verified by the Architect/Engineer.
1. Rippable Weathered Rock is defined as residual material having a volume greater than one (1) cubic yard that, in the opinion of the Geotechnical Engineer, can be effectively plowed, spaded, or removed with power driven excavating equipment having been first loosened with a track-mounted bulldozer equipped with a single-tooth ripper shank, having a minimum draw bar pull rated at not less than 56,000 pounds.
 2. Mass Rock and Trench Rock are defined as residual material having a volume greater than one (1) cubic yard or more for mass excavation or one-half (½) cubic yard for trench or pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, or blasting.
 - a. Mass Rock - Mass Excavation: Late-model, track-mounted bulldozer equipped with a single-tooth ripper shank; rated at not less than 230-hp flywheel power and developing a minimum of 56,000-lbf pryout force; measured according to SAEJ-732 (Caterpillar D-8K, Caterpillar 977 front-end loader or equivalent).
 - b. Trench Rock - Excavation of Trenches and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch-wide, short-tip-radius rock bucket; rated at not less than 120-hp flywheel power with a bucket-curling force of not less than 25,700-lbf and stick-crown force of not less than 18,700 lbf; measured according to SAEJ-1179 (Caterpillar Model 225 or equivalent).
- B. Provide ground vibration monitoring and existing condition/crack survey (video and/or digital) of all nearby structures and/or adjacent properties prior to any blasting operations. Contractor must notify Owner's insurance company of rock removal intent and must obtain all necessary insurance certificates and permissions to expedite this work.

PART 3 - EXECUTION

3.01 CLEARING

- A. Clearing is the removal of all obstructions which interfere with the construction. These items include minor structures above and below existing grades and below finished grades identified on the Drawings, trees and their complete root systems, brush, other vegetative material in any condition (i.e. chipped, cut, wrenched, etc.) rubbish, fences and other such items except items indicated to be preserved on the Drawings.
- B. Set and maintain any Active or Passive Tree, Wetland, Spring, Buffer, Limits of Disturbance or Vegetation Protection Fencing prior to Clearing operations in accordance with the Drawings.

- C. Contractor shall clear only those areas in which construction or grading operations are required and includes all excavated, graded and filled areas. Contractor shall protect all other areas from any damage as a result of clearing operations.
- D. Burning on site shall not be permitted under any circumstances.
- E. Contractor shall remove all cleared material from the Project site and legally dispose of.

3.02 GRUBBING

- A. Grubbing is the removal of all roots and stumps from the ground larger than ¾" in diameter.
- B. Unless otherwise directed, Contractor shall grub all cleared areas;
 - 1. In fill areas where design grade levels for building, roads or paved areas are to be placed, grub to minimum depth of twelve (12") inches below the finished design grade level as indicated on the Drawings.
 - 2. In all areas of excavation for structures, grub to the depth of the proposed excavation or to the depth that allows the area to be free of debris, rock, organic and inorganic materials, and unsuitable soils that would otherwise prevent the soil from being compacted to the density as indicated on the Drawings and stated in the specifications herein.
 - 3. In areas outside of design level grades or building footprint or roads and parking lots where fill is to be placed grub to the existing grade unless the area adjacent requires soils compacted to a density to support the structures, roads, or parking areas.
 - 4. The Contractor shall be responsible for excavating to an appropriate depth and removing and replacing with suitable soils that will allow the soil to achieve the requisite compacted density
 - 5. In areas to be grassed and/or landscaped without fill, grub to a minimum of six (6") inches below the final grade.
- C. Remove all grubbed material from the Project site and legally dispose of.

3.03 CLEAN UP

- A. Burning on site of debris or grubbed material onsite shall not be permitted under any circumstances.
- B. Remove all debris resulting from Clearing and Grubbing operations from the site and dispose of in compliance with all applicable laws and regulations.
- C. Do not place such debris on private property without written consent of the Owner/Architect and the Owner of such property.
- D. Do not place debris or grubbed material around perimeter of site.
- E. Remove all non-organic debris, trash, etc. from the site and dispose of in compliance with all applicable laws and regulations.

3.04 TOPSOIL STOCKPILING

- A. Strip topsoil to full depth encountered in areas indicated to be graded on the Drawings. Stockpiling may recur as required to complete all construction operations. Intermittent movement of Topsoil from one location of the Project site to another shall be included in the Contract Sum. No claim shall be considered by the Owner for the movement of Topsoil.
- B. Prior to stockpiling topsoil, remove tree limbs, tree roots, rocks larger than one inch (1") and other deleterious materials from the topsoil. Removed materials shall become the property of the Contractor and hauled off the site and legally disposed.
- C. Where trees are indicated to remain, stop topsoil stripping at the Critical Root Zone (CRZ). Reference Gwinnett County Tree Preservation Standards for CRZ.
- D. Stockpile topsoil in manner to drain without ponding, and to avoid loss of material through erosion by wind or water.
- E. Do not export any topsoil off-site unless approved in writing by the Owner/Architect.
- F. Re-distribute a minimum of four inch (4") deep layer of topsoil fine graded to finish contour elevations illustrated in non-paved or building areas.

3.05 EXCESS, UNSUITABLE AND INSUFFICIENT MATERIALS

- A. Remove and legally dispose of excess and unsuitable materials from Project site unless directed otherwise in writing by the Owner/Architect/Geotechnical Engineer. Unsuitable material may be placed on Owner's property if and only if approved in writing by the Owner/Architect prior to any on-site distribution as a deductive change order and then shall only be placed in non-structural fill areas of the Project site as designated by the Owner/Architect/Geotechnical Engineer.
- B. Provide satisfactory fill material in areas where existing materials are insufficient or unsuitable for earthwork operations.
- C. If, in the opinion of the Architect/Geotechnical Engineer, the material in its undisturbed natural condition at or below the final design grade as indicated on the Drawings, the excavation is unsuitable for its intended use; it shall be removed to such depth and width as directed and be replaced with suitable material by the Contractor as directed by the Architect/Geotechnical Engineer. The Contractor, unless otherwise directed by the Architect/Engineer or Owner, shall remove and replace unsuitable materials at the unit rates in accordance with the Bid Form. The Owner may elect, in accordance with the provision of the agreement, to direct the Contractor to remove and replace the unsuitable materials on a lump sum or time and materials basis should applicable unit rates not exist or not covered for the unsuitable material being removed. The Contractor shall receive written notice from the Architect/Engineer of means and methods to employ i.e. lump sum, unit rates or time and materials, prior to executing any work deemed in excess of the amount indicated in the Contract Sum.

3.06 EXCAVATION

- A. Excavation shall be made to the design lines and levels illustrated on the Drawings or to such depths, whichever is greater, as further described elsewhere in this section and to such widths as will give suitable room for construction of the structures, for bracing and supporting, pumping and draining and inspection. The bottom of the excavations shall be rendered clean, firm, level and dry and in all respects acceptable to the Architect/Geotechnical Engineer. Where changes in levels occur, provide vertical steps in horizontal runs.
- B. Excavation and dewatering shall be accomplished by means and methods which preserve the undisturbed state of subsurface soils. Exposed subsurface shall be proof-rolled with at least two (2) coverages of the specified equipment. The Architect/Geotechnical Engineer shall waive this requirement if, in his/her opinion, the subsurface will be rendered unsuitable by such compaction. Subsurface soils which become soft, loose, "quick", or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering, proof-rolling, or other construction methods shall be removed and replaced by structural fill as required by the Architect/Geotechnical Engineer at the Contractor's expense.
- C. Dewatering shall be such as to prevent boiling or detrimental under-seepage at the base of the excavation as specified herein.
- D. Contractor shall prepare subsurface areas for all structures unless otherwise illustrated on the Drawings or otherwise specified elsewhere in this Section:
1. Roughly level and proof roll these areas with a 25-ton roller, (or the equivalent) making at least four passes (two passes being perpendicular to the others).
 2. Compact the top twelve inches (12") of fill below subsurface to a minimum of 100 percent Standard Proctor (ASTM D698).
 3. Where structures are supported by piles, compact the top twelve inches (12") of subsurface to a minimum of 95 percent Standard Proctor (ASTM D698).
- E. Excavation equipment shall be satisfactory for carrying out the work in accordance with the requirements specified. In no case shall the earth be ploughed, scraped, or dug with machinery so near to the finished design limits indicated on the Drawings as to result in excavation of, or disturbance of material below design limits. The last of the material loosened by mass excavation shall be removed with pick and shovel immediately prior to placement of concrete or the working mat.
- F. When excavation for foundations has reached prescribed depths, the Architect/Geotechnical Engineer shall be notified and will inspect conditions. If materials and conditions are not satisfactory to the Architect/Geotechnical Engineer, the Architect/Geotechnical Engineer will issue instructions as to the procedures to resolve the issue(s) in question.
- G. During final excavation to design limits as indicated on the Drawings, take whatever precautions are required to prevent disturbance and remolding. Material which has become softened and mixed with water shall be removed. Hand excavation of the final three to six inches (3-6") will be required as necessary to obtain a satisfactory undisturbed bottom. The Architect/Geotechnical Engineer will be the sole judge as to whether the work has been accomplished satisfactorily.

- H. Over-excavation by the Contractor beyond the design limits and depths required or indicated on the Drawings shall be replaced with lean concrete, compacted structural fill, crushed stone, or other materials as directed by the Architect/Geotechnical Engineer at no change in Contract Sum or Time.
- I. If soil conditions permit, cut footing trenches to exact size of footing and omit forms. Notify Architect/Geotechnical Engineer if earth of doubtful bearing is encountered. If adequate bearing is not encountered within eight inches (8") of depth illustrated on the Drawings, excavations shall be carried deeper upon written authorization and paid for as additional work in accordance with Contract Conditions.
- J. If excavations are carried deeper than required by the Drawings or the specifications in error, the additional depth shall be filled with materials specified for footings or concrete of class specified for footing at no additional cost to Owner.
- K. Protect excavations against cave-ins, ponding and freezing. When freezing can be anticipated prior to placing of concrete, protect excavations or delay carrying excavations to full depth until concrete can be placed.
- L. Maintain excavations free of surface water. Provide pumps if required to drain excavations. Provide and maintain temporary drainage ditches as required.
- M. Notify Architect/Geotechnical Engineer when footing excavations are complete. Geotechnical Engineer will perform appropriate density testing of the excavations prior to placing formwork, reinforcement steel, anchor bolts and concrete.
- N. Contractor shall be fully responsible for all damage to any part of the site, building structures or other installations, caused by water.
- O. Concrete should be placed the same day earth excavation is made. If it is necessary for excavations to remain open overnight, provisions should be made to prevent collection of surface run-off in the excavation.

3.07 EXCAVATION OF ROCK

- A. If rock is encountered, clear away earth and expose materials. Notify Architect /Geotechnical Engineer and receive written instructions prior to excavations. Measure and estimate extent of rock to be excavated. Geotechnical Engineer shall identify, qualify and verify in writing whether the material shall be classified as rock and shall confirm the extent and quantity of rock to be excavated.
- B. Only rock excavation done in accordance with Architect/Geotechnical Engineer's instructions will be paid for by Owner as additional work in accordance with Contract Conditions.
- C. Contractor shall remove rock in accordance with the following:
 - 1. Remove rock to a depth of six inches (6") below proposed slabs and pavement
 - 2. Twenty four inches (24)" on each side of and below footings of the proposed building walls.
 - 3. Six inches (6") below and eight inches (8") to each side of conduits, ducts and pipes

installed in utility trenches, with minimum width of thirty six inches (36").

4. Twelve inches (12") below finished grade in areas to receive landscaping, sodding and seeding.
- D. Perform blasting only after receiving written approval from Architect/Geotechnical Engineer and notifying Owner's insurance company of intent. Engage skilled mechanics to perform blasting. Provide heavy mats to minimize concussion. Handle, store and use explosives in accordance with the "Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc.", latest edition, with amendments.
 - E. Notify residents within ½ mile radius of the site of intent to conduct blasting operations and furnish all monitoring of existing structures within ½ mile radius as part of the Unit Price for rock excavation established in the Bid Form.

3.08 EXCAVATION AND BACKFILL OF UTILITY TRENCHES

- A. Excavation for all trenches required for the installation of pipes and ducts shall be made to the design levels indicated on the Drawings and in such a manner and to such widths as will give suitable room for laying the pipe or installing the ducts within the trenches, for bracing and supporting, and for pumping and drainage facilities. Bottoms of excavations shall be rendered firm and dry and in all respects acceptable to the Architect/Geotechnical Engineer. Bituminous pavement, when encountered, shall be cut with pneumatic chisels along smooth and straight lines before excavating. Saw-cutting is required on all asphaltic concrete.
- B. Rock shall be removed in accordance with Section 3.07.
- C. Where pipe or ducts are to be laid in gravel or sand bedding or encased in concrete, the trench may be excavated by machinery to, or just below the design level indicated on the Drawings provided that the material remaining in the bottom of the trench is no more than slightly disturbed.
- D. Where pipe or ducts are to be laid directly on the trench bottom, the lower part of the trenches shall not be excavated to the design level by machinery, the last of the material being excavated manually in such a manner that will give a flat bottom true to grade so that pipe or duct can be evenly supported on undisturbed material. Bell holes shall be made as required.
- E. When excavation methods include the use of a steel trench box, comply with the following requirements:
 1. When installing rigid pipe Reinforced Concrete Pipe (RCP), Ductile Iron Pipe (DIP), etc], any portion of the box extending below mid diameter of the pipe shall be raised above this point prior to moving the box ahead to install the next pipe. This is to prevent the separation of installed pipe joints due to movement of the box.
 2. When installing flexible pipe (PVC, ABS solid wall, ABS truss, etc.), the bottom of the box shall not extend below mid diameter of the pipe. This is to prevent loss of soil between the box and the pipe bedding which could result in excessive deflection of the installed pipe.

- F. Backfilling over ducts, pipes, conduits, etc. shall begin not less than three days after placing concrete encasement or until the test sample achieves prescribed strength of tested sample.
- G. Where pipe is to be installed in fill of any type, fill shall be placed and compacted to the total depth required and then re-excavated for pipe installation.
- H. As soon as practicable after the pipe has been laid and jointed, backfilling shall begin and thereafter be completed expeditiously. If required, as illustrated on the Drawings, screened gravel shall be placed around the pipe to its mid-diameter. As the screened gravel is placed, it shall be compacted by suitable tools. Compaction shall meet a minimum criterion of 98% Standard Proctor at or near its optimum moisture content (minus 2 to plus 3 percent).
- I. For Aluminized Steel, Type 2 (AST2) pipe for water main or sanitary sewer system refer to Gwinnett County Standards.
- J. For Plastic (PVC) pipe for drainage systems or roof leaders grade trench bottom to uniform slope to provide a firm, unyielding bearing surface along the entire length of the barrel of the pipe.
- K. Continue backfilling with suitable soil in six inch (6") layers by hand, tamping material by hand operated tampers to a level eighteen inches (18") above top of pipe.
- L. Form depressions for hubs and similar joints only in size as required for making joint.
- M. In areas of rock excavation, and where needed in other areas, provide crushed stone bedding for all pipes.
- N. Provide bedding over the full width of excavation to a minimum depth of six inches (6") under pipe.
- O. Whenever the subsurface is unstable or too soft to provide a satisfactory pipe foundation for any pipe, undercut the trench as necessary and backfill with crushed stone. Compact and bring the material to proper grade to create a firm, unyielding foundation.
- P. After the bedding, if required, has been placed to the mid-diameter of the pipe, select common fill shall be placed to a depth of twelve inches (12") over the top of the pipe. Material shall be thoroughly compacted by hand-tamping as placed with at least one man tamping for each man shoveling material into the trench. Compaction shall result in achieving a 95% Standard Proctor test at or near its optimum moisture content (minus 2 to plus 3%).
- Q. Where the pipes are laid in unpaved areas, the remainder of the trench shall be filled with common fill in layers not to exceed twelve inches (12") and thoroughly compacted by rolling, ramming, or puddling sufficiently to prevent subsequent settling to 95% Standard Proctor at or near its optimum moisture content (minus 2 to plus 3%). The backfill shall be mounded 3 inches (minimum) above the finish or existing grade or as directed by the Geotechnical Engineer. Wherever a loam or gravel surface exists prior to excavations, it shall be removed, conserved and replaced to the full original depth as part of the work under the pipe items. In some areas it may be necessary to remove excess material during the clean-up process, so that the ground may be

restored to its original level and condition. If the Contractor prefers not to store loam, gravel, or topsoil he/she shall replace it with material of equal quality and in equal quantity.

- R. Where the pipes are laid in streets, or other paved areas, the remainder of the trench above the bedding and up to a depth of twelve inches (12") below the bottom of the specified paving shall be backfilled with common fill in 6-inch (max.) layers thoroughly compacted by rolling or ramming to 98% Standard Proctor. The twelve inch (12") layer below the bottom of the specified paving shall be of Class A or B stone, compacted in six inch (6") layers to 98% modified Proctor.
- S. Along the length of all pipeline and duct trenches, impervious dams or bulkheads of clay thirty six (36") thicknesses or concrete twelve inch (12") thickness shall be constructed in the trench bottom at three foot (300') intervals or at manholes and structures, whichever is less, to obstruct the free flow of groundwater after construction is completed. Provide impervious dams at all points where a pipe trench enters an excavated area where a permanent under drain system is installed.
- T. Do not over-excavate. If specified trench widths are exceeded, Contractor shall adhere to Section 3.6.1 H. Architect may require installation of stronger pipe or special installation procedures at no additional cost to Owner.
- U. Water line trenches shall be excavated to avoid high points requiring the installation of vacuum and relief valves below the frost line.
- V. Cutting and removing existing pavements where required shall be done in neat lines and in accordance with 3.6.3 A of this Section.
- W. Do not backfill over utility lines which have not passed required testing or inspections including the Geotechnical Engineer's inspection of the subsurface has not been done and or other Inspections, testing and regrading locations of subsurface utilities is not accomplished.
- X. Contractor is to continue to backfill all trenches with suitable fill material in six (6") inch lifts immediately after the pipe is laid or bedded as described in items 3.6.3 I, J and K above using suitable soils and adhering to the backfilled requirements of paved or unpaved areas. Compact trench backfill with portable compaction equipment.
- Y. If sufficient suitable excavated material is not available on site, provide sufficient and suitable borrow material for backfill (See Paragraph 2.3 of this Section).
- Z. Backfill from twelve inches (12") above the pipe to finish grade shall be as follows:
 - 1. Trenches in areas not to be paved may be backfilled and compacted by methods of Contractor's choice. Compact backfill to 95% Standard Proctor Density. Refill the trench as often as required to maintain the design elevation at proper grade.
 - 2. Trenches in areas to be paved and in areas beneath proposed structures shall be backfilled with granular material. Compact backfill to 98% Standard Proctor Density with top 12 inches compacted to 100% Standard Proctor Density or as specified by Geotechnical Report. Compact backfill further, if necessary, either by leaving the backfilled trench open to traffic while maintaining the surface or by the use of compaction equipment as required.

Refill settlement in trenches with material acceptable to Geotechnical Engineer and continue such maintenance until pavement placement is authorized by the Owner/Architect Engineer.

AA. Fill and backfill materials shall not be placed on frozen surfaces, or surfaces covered by snow or ice. Fill and backfill material shall be free of snow, ice and frozen earth.

BB. Utility Trenches:

1. Excavate trenches to a maximum width equal to pipe diameter plus 2'-0" for pipes 30" diameter and smaller; 2'-6" plus pipe diameter for pipe exceeding 30" diameter. Minimum excavation width shall be 3'-0". Do not over-excavate. If specified trench widths are exceeded, Architect may require installation of stronger pipe or special installation procedures at no additional cost to Owner.
2. The bottom of trenches, when in rock, shall be excavated a minimum of 6" below required bottom of pipe, refilled with fill material free of rock larger than 3" in any dimension, and compacted to bedding level to provide uniform bearing and support along the length of each pipe section.
3. Pipe shall be carefully bedded in soil foundation. See paragraph 3.10.
4. Water line trenches shall be excavated to avoid high points requiring the installation of vacuum and relief valves below the frost line.
5. Cutting and removing existing pavements where required shall be done in neat lines.

CC. Proofrolling::

1. After the site has been properly drained, and all organic surface soils have been removed, the site shall be inspected by a Geotechnical Engineer and proofrolled at that time.
2. Proofrolling shall consist of several overlapping passes of heavily loaded 20-30 ton dump truck.
3. The purposes of the proofrolling will be to detect any areas where soft or unstable soils are present, as well as to improve the density of the loose near-surface soils.
4. Proofrolling shall be performed in the presence of the Geotechnical Engineer who can observe any areas where remedial action may be required.
5. Any soft or yielding areas shall be thoroughly undercut and replaced with well-compacted structural fill 95% Standard Proctor with the top 12" compacted to 98% Standard Proctor Density or as specified by the Geotechnical Report.
6. The groundwater level should be maintained at a depth of at least 2 feet below the depth of vibratory rolling operations. This work should be anticipated.
7. A minimum of four complete overlapping passes shall be made in each of two perpendicular directions.

3.09 EXCAVATION EMBANKMENT AND BRACING

- A. Accept full responsibility for all excavations. He shall protect all excavation embankments against collapse. Where possible, embankments over 5'-0" high shall be made at a slope not greater than 1½ horizontal to 1 vertical; or where the soil is very sandy or wet, the slope should not be greater than 2 horizontal to 1 vertical. Steeper slopes than those suggested herein may be employed when the work is under the supervision of a Registered Professional Engineer responsible for the design engineering of all shoring and bracing techniques required to accomplish the work and shall be employed by the Contractor.

- B. Where it is not possible to provide a safe embankment slope, all banks shall be temporarily supported and maintained secure until permanent support has been provided.
- C. Where ditches or trenches are over 5'-0" deep, cross bracing and shoring shall be provided to prevent collapse.
- D. Provide bracing systems designed by an Registered Engineer in the State of Georgia, experienced in such designs and acceptable to the Architect. The design Drawings shall show the work and sequence in its entirety and be submitted to the Architect for approval prior to commencing work.
- E. To prevent caving, or settlement of earth adjacent to excavations, and for the protection of persons as well as property, shoring, bracing and other similar work shall be provided and installed to meet the conditions in each particular case and shall be left in place until construction has reached a point where backfills behind walls or in ditches have been made and the need for shoring and bracing eliminated.

3.10 BEDDING

- A. Bedding shall conform to the following Specifications unless illustrated otherwise elsewhere in these documents:
 - 1. For ductile iron, cast iron or plastic (SDR) pipe for water main or sanitary sewer system refer to Gwinnett County Standards.
 - 2. For corrugated metal pipe (CMP), concrete pipe (RCP) or plastic (PVC) pipe for storm water drainage systems or roof leaders grade trench bottom to uniform slope to provide a firm, unyielding bearing surface along the entire length of the barrel of the pipe. Bed pipe in trenches on continuous soil foundation shaped to lowest one-fourth of pipe profile, unless illustrated otherwise in these documents. Continue backfilling with suitable soil in 6" layers by hand, tamping material by hand operated tampers to a level 18" above top of pipe. Form depressions for hubs and similar joints only in size as required for making joint.
 - 3. In areas of rock excavation, and where needed in other areas, provide crushed stone bedding for all pipes. Provide this bedding over the full width of the excavation to a minimum depth of 6" under the pipe.
 - 4. Whenever the sub-grade is unstable or too soft to provide a satisfactory pipe foundation for any pipe, undercut the trench as necessary and backfill with crushed stone. Compact and bring the material to proper grade to create a firm, unyielding foundation.

3.11 TRENCH BACKFILLING

- A. Do not backfill over utility lines which have not passed required testing or inspections including:
 - 1. Geotechnical Engineer inspection of subgrade.
 - 2. Inspections, testing and regrading locations of subgrade utilities.
- B. Backfill all trenches and excavations immediately after the pipe is laid using suitable soils:

1. If sufficient suitable excavated material is not available on site, provide sufficient and suitable borrow material for backfill. See Paragraph 2.03 of this Section.
2. Backfill from 18 inches above the pipe to grade shall be as follows:
 - a. Trenches in areas not to be paved may be backfilled and compacted by methods of Contractor's choice. Compact backfill to 90% Standard Proctor Density. Refill the trench as often as required to maintain the design elevation at the proper grade.
 - b. Trenches in areas to be paved and in areas beneath proposed structures shall be backfilled with granular material. Compact backfill to 95% Standard Proctor Density with the top 12" compacted to 98% Standard Proctor Density or as specified by the Geotechnical Report. Compact backfill further, if necessary, either by leaving the backfilled trench open to traffic while maintaining the surface or by the use of compaction equipment as required. Refill settlement in trenches with material acceptable to the Geotechnical Engineer and continue such maintenance until pavement placement is authorized by the Owner's Representative.

3.12 FILLING

- A. Preparation of Surface to Receive Fill (Reference and follow the Geotechnical Engineer's recommendations in his report)
 1. Remove vegetation, top soil, debris, unsuitable soil materials, obstructions and deleterious materials from ground surface prior to placement of fill. Break up (and periodically cut benches into) sloped surfaces steeper than one vertical to four horizontal so that fill material will bond with existing surface. Surfaces to receive fill material shall be inspected and approved by Geotechnical Engineer.
 2. When existing ground surface has density less than that specified for particular area classification, break up the ground surface, pulverize, moisturize soil to optimum moisture content, and compact to required depth and percentage of maximum density.
 3. Subgrade shall be proof-rolled with a 20 to 30 ton heavily loaded dump truck, scraper or similar rubbertired equipment in the presence of the Geotechnical Engineer and/or Owner's representative. Proof-rolling shall be performed in two mutually perpendicular directions, with at least two passes in each direction. Areas which exhibit signs of instability that cannot be stabilized with further compaction shall be undercut to a suitable grade and backfilled with structural fill.
- B. Benching should be made periodically; create an eight foot to ten foot (8'-10') wide bench for each two vertical foot (2 VF) of fill placed. Insure stable interface between old fill and newly placed fill.
- C. Place fill materials in layers not more than six inch (6") loose depth. Before compaction, moisten or aerate each layer to provide the optimum moisture content plus or minus 2%, or as specified in soils report. See paragraph 3.12 below for compaction requirements of fill. Do not place backfill or fill material on muddy, frozen surfaces or surfaces containing any frost or ice. Compaction shall be inspected by Geotechnical Engineer.
- D. No soil found on the site or transported to the site which is contaminated with material containing asbestos, PCB's, radon, gasoline, fuel oil or other fossil fuels shall be used for fill,

backfill, or planting topsoil. Any contaminated soil found on the site shall be removed and disposed of in a manner approved by the appropriate regulatory agencies.

3.13 GRADING AND FILLING AROUND TREES

- A. Obtain a copy of Gwinnett County Tree Preservation Standards which are hereby made a part of these Specifications; and follow all pertinent guidelines regarding Grading and Filling operations at or near Tree Save Areas as illustrated on the Drawings.
- B. Maintain existing grade within Critical Root Zone (CRZ) of trees unless otherwise Indicated.
- C. Where existing grade is above new finish grade illustrated around trees, hand excavate within drip line to new grade. Cut exposed roots approximately 3" below elevation of new finish grade. Employ a tree surgeon to recommend procedures such as pruning of branches and stimulation of root growth. Provide subsequent maintenance during the contract period as recommended and long range maintenance procedures to be followed after completion of construction operations.
- D. Raising Grades
 1. Where existing grade is 4" or less below elevation of finish grade shown, provide fill using stockpiled topsoil. Use topsoil as specified. Place topsoil in single layer and do not compact.
 2. Where existing grade is more than 4" but less than 8" below elevation of finish grade shown, place a layer of drainage fill on existing grade prior to placing topsoil. Place fill against trunks of trees to an elevation of approximately 2" above finish grade and extending not less than 18" from tree trunk on all sides. For balance of area within drip line perimeter, place drainage fill to an elevation 4" below finish grade and complete fill with a 4" layer of topsoil. Do not compact stone or topsoil layers.

3.15 COMPACTION

- A. Perform compaction of soil materials for fills using mechanical soil compaction equipment for type and size materials to be compacted. Hand compact materials in areas inaccessible to machinery.
- B. Provide the percentages of specified compaction at the specified moisture content in the specified lifts as outlined in the Geotechnical Report. If no specification is given in said report, use the following as a minimum at 3% plus or minus of optimum moisture content placed in 8" lifts:
 1. Provide 95% maximum dry density with top 12" to 98% maximum dry density for fill under building slabs, extending beyond the building outlines a distance equal to twice the height of the fill beneath any edge of building. Fill should then slope not steeper than one vertical to two horizontal (2H:1V);
 2. Provide 95% maximum dry density with the top 12" to 98% maximum dry density for fill under asphaltic pavements;
 3. Provide 95% maximum dry density Standard Proctor and top 12" to 98% maximum dry density for fill under concrete footings, concrete sidewalks, concrete steps and concrete ramps and trench backfill.

4. Provide 90% maximum dry density for all other non-paved fill material unless otherwise indicated.
- C. Where subgrade or soil layer must be moisture conditioned before compacting, apply water to surface of subgrade or soil layer. Scarify and air dry soil material that is too wet to permit compaction to specified density.
- D. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread where directed by Architect and permitted to dry. Assist drying by discing, harrowing or pulverizing, until moisture content is reduced to satisfactory value, as determined by moisture density relation tests. When accepted by the Geotechnical Engineer, soil material may be used in compacted backfill or fill.
- E. Remove unsuitable material at the site for the proposed structures and paved areas from the existing grade. No water shall be allowed to accumulate in the excavation, or on the subgrade soils during construction. Soils which will be exposed during construction are very sensitive to disturbances and strength degradation in the presence of excess moisture. They are also frost susceptible. The amount of time natural subgrades are exposed to the elements must be minimized in order to prevent possible subgrade degradation. Work must be completed such that excavation, inspection, undercutting, backfill and/or concrete mud matting can be accomplished expeditiously in a given area.
Foundations have been designed for bearing capacity of 3000 psf bearing. Contractor shall verify the bearing capacity prior to placing footings. If tests indicate less than assumed capacity, receive instructions from the Architect.

3.16 FINISH GRADING

- A. Finish grade disturbed areas, with a minimum 4" depth of topsoil, in smooth, uniformly leveled, crowned, or contoured slopes between all new elevation surface points to existing, undisturbed grade elevations.
- B. Grade areas adjacent to buildings for positive drainage to storm drainage structures and prevent ponding. Finish grades shall be within one tenth of a foot (0.1') of indicated elevations.
- C. The Drawings indicate the levels, slopes and contours of finished grade elevations for the entire site. Slight modifications as determined by the Architect may be required, the Contractor shall make these modifications without extra cost to Owner.
- D. Where compacted areas are disturbed by construction operations, scarify surface, reshape and compact to required density.
- E. Redistribute stockpiled topsoil to uniform depth over graded areas and other areas to receive landscaping or grassing, in a 4" minimum depth. In the event that stripped topsoil is not sufficient to render a 4" minimum depth, import clean topsoil sufficient to render a minimum 4" depth as part of the Contract Sum at no additional cost to the Owner.

- F. Redistribute excess topsoil, subsoil from footing excavations, other soil matter and debris on approved areas of the Owner's property at no additional cost to the Owner.
- G. At completion of finish grading operation, entire site shall be ready for planting or grassing.
- H. Where finish grading meets or abuts curbs, walks or similar pavements, upstream grades shall be slightly higher than pavements to permit drainage and prevent ponding behind curbs or walks.
- I. Protect newly graded surfaces from traffic and erosion and keep free of debris. Where graded or compacted surfaces are damaged by subsequent operations, return to proper grade and state of compaction.

3.17 GRADE MAINTENANCE

- A. Provide additional fill material, remove excess material, or redistribute materials as required, should grades be changed by erosion or other causes during course of construction, without additional cost to Owner. Reference Job Condition of this Section.

3.18 FIELD QUALITY CONTROL

- A. Notify Geotechnical Engineer of the progress of work under this section on a continuing basis so that necessary field soil engineering and testing services may be provided during site preparation, excavation, fill placement and foundation phases of the Project. Do not proceed with additional portions of work until results of previous phases have been verified.
- B. Geotechnical Engineer will verify that all existing fill, topsoil, soils containing organic matter and all other undesirable materials are removed and only engineered fill is placed over suitable subgrade soils.
- C. If, during progress of work, tests indicate that compacted materials do not meet specified requirements, remove defective work, replace and retest at no cost to Owner.
- D. Ensure compacted fills are tested before proceeding with placement of surface materials.
- E. The Geotechnical Engineer will observe all "benching" operations as fill placement progresses to the existing slopes.
- F. Geotechnical Engineer will observe the foundation construction as directed by the Architect, and determine the adequacy of bearing surfaces prior to construction of foundations.
- G. Geotechnical Engineer will make all tests of backfill materials to determine their suitability for compaction, and will observe the placing of backfill as directed by the Architect.
- H. Geotechnical Engineer and the Architect shall have the power of rejection of materials, equipment or operating procedures of the backfilling operation. The Contractor shall replace,

rework or correct work which does not meet the Specifications as directed by the Geotechnical Engineer and/or the Architect at no cost to the Owner.

- I. Notify Geotechnical Engineer at least 24 hours prior to the time when testing will be required.
- J. Additional tests on completed fill may be authorized by the Owner. If such tests indicate failure to meet the Specifications, the costs of these tests and subsequent retests will be paid by the Contractor. Otherwise, the costs of these tests will be paid by the Owner.
- K. In-place density tests shall be performed by the Geotechnical Engineer according to the following requirements:
 - 1. In the general building area, conduct one test for every 2,500 square feet for each two feet depth.
 - 2. At wall and trench backfill areas, conduct one test for every 50 lineal feet for each two feet depth.
 - 3. In all cases, a test is required within the top foot of fill.
 - 4. Sidewalks - One test for each two foot lift of each 5,000 sq. ft. of area.
 - 5. General area fill - One test for each two foot lift of each 10,000 sq. ft. of area.

3.19 "AS-BUILT" SURVEY

- A. Employ the services of an independent Registered Land Surveyor (R.L.S.) for the "As-Built" Record Drawings. The R.L.S. will hold active licensure and registration in the State of Georgia.
- B. Provide a detailed "As-Built" topographic and utility survey of sufficient detail and accuracy to verify compliance with contract provisions. The minimum requirements for the survey shall include:
 - 1. +/- 0.05' for building corners and line.
 - 2. +/- 0.10' for drainage and utility structures.
 - 3. +/- 0.10' for pavements, walks and other improvements.
 - 4. Grid: Maximum of 25' - 0" grid.
 - 5. Contour interval : Maximum 2' - 0".
- C. Furnished to the Architect/Owner both printed, hard copy and electronic file formats of survey data.
 - 1. Provide requisite numbers of survey on 30" X 42" sheets; each sheet containing an original surveyor's seal and signature.
 - 2. Provide two each CD ROMs containing survey data on a CAD version which is fully compatible with AutoCAD version 2008.
- D. Re-Survey Responsibility: Where results of required survey prove unsatisfactory and do not indicate compliance of related work with requirements of Contract Documents, then re-surveys are responsibility of General Contractor, regardless of whether the original survey was General Contractor's responsibility. The topographic and utility survey performed by the General Contractor shall be by the same Surveyor and meet the same requirements as the original verification survey described above.

- E. Engineer's Responsibilities: Upon receipt of survey data, the Civil Engineer shall verify that grades, elevations, lines and inverts comply with the contract provisions. Should conditions not comply with contract requirements the Civil Engineer shall notify the General Contractor through the Architect of noted deficiencies.

End of Section

SECTION 02 270

EROSION, SEDIMENT AND POLLUTION CONTROL

PART 1 - GENERAL

1.01 SCOPE

- A. Work described in this section includes the containment of sediment transport, control of erosion and treatment of pollutants prior to, during and throughout all construction operations; establishment of permanent vegetative cover and continued maintenance of said measures in accordance with Part 3.0 - Execution, Paragraph. 3.04 - Maintenance of this section for the Project site.
- B. Protect downstream properties from encroachment or damage from soil erosion and/or the discharge of pollutants by water or air to any areas off the Project site.
- C. All control measures illustrated on the Drawings are to be considered the minimum required; additional control measures will be added if determined to be needed by any on-site inspections. Provide same as required.
- D. Perform all on-site monitoring of Erosion, Sediment and Pollution Control measures.
- E. All discharge monitoring shall be the responsibility of the Owner.
- F. Comply with all applicable criteria of the State of Georgia and EPD Permits which is hereby made a part of these Specifications by reference. All such criteria are hereby made a part of Contractor's work and should be included in his Contract Sum.
- G. Certify all means, methods, labor, equipment and materials to complete the satisfactory construction of the project is included within the bid.
- H. Related Work Specified Elsewhere:
 - 1. Reference Section 02 220, Earthwork.
 - 2. Reference Section 02 933, Temporary Seeding.

1.02 SUBMITTALS

- A. Schedule of operations:
 - 1. Submit schedule of exact dates operations including program for erosion, sediment and pollution control measures, maintenance of all said measures including control facilities, structures and devices and vegetative practices.
 - 2. Show anticipated starting and completion dates for land-disturbing activities including excavation, filling and rough grading, finished grading, construction of temporary and permanent control measures, and disposition of temporary erosion sediment and pollution control measures.
- B. Submit a sample of erosion control blanket material such as "Curlex", "Bon Terra-CS2" or "Ero-Mat" by Verdyol or other approved equal for all disturbed slope areas 3:1 (33%) and greater on the site .

- C. Submit a sample of erosion control blanket material such as "Bon Terra-CS1" or other approved equal for all disturbed slope areas 3:1 (33%) and less on the site .
- D. Submit a sample of the synthetic polymer such as "Siltstop" by Applied Polymer Systems or approved equal.
- E. Submit a sample of Type C silt fence such as "Mirafi Filterweave 402" or other approved equal.

1.03 PROJECT CONDITIONS

- A. Contractor should note that he is solely responsible for furnishing and installing all control measures prior to or concurrent with any land disturbance activity.
- B. Contractor is responsible for the initial provision and installation all control measures and then the continued provision and installation of all further measures throughout all construction operations and all sequences of construction operations.
- C. Schedule grading operations to allow permanent erosion control to take place in the same construction season.
- D. Avoid or minimize exposure of soils to winter weather.
- E. Maintain all controls until vegetative cover has been established.
- F. Construct and maintain temporary control measures until such time as permanent measures are effective in control of erosion, sediment and pollution from the site.
- G. Extent of measures shall be responsibility of Contractor.
- H. Stop all erosion, sediment or pollution from leaving the site and encroaching on downstream or surrounding properties.
- I. Temporary grassing shall be applied to all disturbed areas left idle for seventy two hours (72) per "Manual for Erosion and Sediment Control in Georgia", latest edition published by the "Georgia Soil and Water Conservation Committee".
- J. Contractor is responsible for all quantities of all control measures regardless as illustrated on the Drawings.
- K. Extent of soil erosion control measures illustrated on the Drawings should be considered minimum

1.04 QUALITY CRITERIA

- A. Procedures shall comply with "Manual for Erosion and Sediment Control in Georgia", latest edition published by the Georgia Soil and Water Conservation Committee." Contractor to keep a copy of the Manual on site at all times.

- B. Reference the Drawings for any other procedural manuals, publications, permits or other field guidelines required for the Contractor to obtain, understand and utilize in the performance of his work. By reference of same, said materials are made a part of these Specifications. Keep a legible copy of said manuals, publications, permits or other guidelines onsite at all times.

PART 2 - PRODUCTS

2.01 FILTER FABRIC

- A. Filter fabric for silt fences shall be a 36" high Georgia DOT approved pervious sheet of strong rot-proof synthetic polymer filaments non-calendered woven fabric constructed with monofilament yarns only with wire fence backing. Filter fabric shall be of type recommended by its manufacturer for the intended application. The filter fabric shall meet the requirements for Type "C" Fencing as per Section 171.02 of the Georgia DOT Standard Specifications 1993, or latest edition..

2.02 FILTER STONE

- A. Aggregate filter shall conform to following gradations:

	% by weight passing		
	<u>Sieve Size</u>	<u>Square mesh sieve</u>	
1.	3"	100	
2.	3/4"		20 - 90
3.	No. 4		0
		- 20	

2.03 STONE FOR EXIT/ENTRANCE PAD

- A. Stone shall comply with ASTM D448 size #1 (1½" to 3½").

2.04 EROSION CONTROL BLANKET

- A. All areas of disturbance on slopes >3:1 (33% or greater):
 - 1. Biodegradable netting impregnated with excelsior wood fiber such as manufactured by "Curlex";
 - 2. "Ero-Mat" by Verdyol;
 - 3. "Bon Terra CS2";
 - 4. Or approved equal.
- B. All areas of disturbance on slopes <3:1 (33% or less):
 - 1. "Bon Terra CS1";
 - 2. Or approved equal.

2.05 SYNTHETIC POLYMERS

- A. Furnish, maintain on site and apply as necessary on all newly disturbed, graded or exposed soil surfaces, 1.50 gals/acre of approved erosion control polymer.

- B. Erosion control polymer is a water soluble synthetic polyacrylamide polymer suitable to be applied to disturbed soil surfaces where the polymer will chemically bind to fine clay particles and prevent clay from going into solution, such as:
 - 1. APS 600 Series Silt Stop, as manufactured by Applied Polymer Systems, Woodstock, Georgia, Contact Steve Iwinski (678) 494-5998.
 - 2. GeoPolymer as manufactured by GeoStop.
 - 3. Soil Mulch Polymer as manufactured by SoilMulch.
 - 4. Approved equal.
- C. Polymer shall be applied utilizing a hydro seeder mix of appropriate seed, fertilizer, lime and mulch for the same acre or without seed/fertilizer/lime/mulch mix.
- D. Follow all manufacturers instructions and recommendations. Do not mechanically disturb treated areas after application. (This does not include foot traffic as necessary to install erosion control blanket).
- E. Furnish and install as necessary a minimum 200 lbs. of APS 700 Series Silt Stop erosion control polymer for incidental "touch-up" or point source erosion areas."
- F. Furnish two (2) forms of synthetic polymer:
 - 1. Emulsion polymer for hydro seeder application with an active strength of 30%.
 - 2. Powder polymer for hand spreading with an active strength of 95%.

PART 3 - EXECUTION

3.01 TEMPORARY EROSION CONTROL DEVICE

- A. Construct temporary sediment barriers of silt fence at all points where surface water flows from construction area bypassing a temporary sediment traps if the area is subject to soil erosion; or as otherwise indicated on Drawings or as deemed necessary by the Engineer and County Inspectors.
- B. Install temporary sediment traps and temporary sediment basins in accordance with the location and details illustrated on the Drawings.
- C. Continually remove accumulated sediment when they are one-third full of silt continually until permanent vegetative cover is established.
- D. Install construction exit as indicated on Drawings. Maintain to prevent tracking and flow of mud onto public roads.
- E. Construct diversion berms, dikes (2'-0" wide x 1'-6" tall) or ditches at the tops of all slopes or as otherwise indicated on the Drawings, to intercept storm water runoff from higher areas and to divert it from exposed slopes to a stabilized outlet.
- F. Construct flexible downdrains to convey concentration of storm water down the face of cut or fill slopes, or as otherwise indicated on the Drawings, to intercept storm water from higher to lower levels without causing slope erosion.

- G. Machine compact these elements and plant temporary seed until permanent vegetative cover can be established.
- H. Maintain temporary barriers until permanent erosion control measures are established. Repair and replace barriers damaged or displaced by construction activity.
- I. Clean out and/or adjust temporary sediment basin(s)/facility elevations to specified depth throughout duration of Project after stabilization of all disturbed areas.
- J. Compact embankment of sedimentation basin to minimum 95% Standard Proctor to the grade elevations illustrated on the Drawings.

3.02 SEDIMENTATION FACILITIES

- A. Construct temporary sedimentation facility prior to or concurrent with rough grading of site.
- B. Permanent sedimentation control measures shall be constructed concurrently with fine grading or partial fine grading of site and vegetative stabilization.
- C. Direct surface water into completed portions of sedimentation facility.
- D. Maintain temporary sediment traps around and at all drainage structures (both on-site and/or off-site) until permanent vegetative cover has been established to prevent washing of sediment into public storm sewer system.
- E. Utilize "pigs-in-a-blanket" as temporary sediment traps at all completed or partially completed swingle wing, double wing catch basins, drop inlets and yard inlets on the site and at any existing basins and inlets adjoining the site that can be affected by sediment washing off the site.
- F. Flush drainage lines between manholes and drainage structures as required during construction and after establishment of permanent erosion control measures to remove collected debris.
- G. Install rip rap at all locations indicated on Drawings as soon as feasible.
- H. Rip rap shall be reasonably well-graded granite stone sized from smallest to maximum size specified. Stones smaller than smallest size specified is not permitted. Control gradation of rip rap by visual inspection to assure thickness of rip rap conforms with contract document requirements.
- I. Provide geotextile filter fabric under rip rap.
- J. After land disturbance operations of any kind, survey the sediment facility and determine that sediment volume that is available.
- K. If specified volume is not available, disassemble control measures, excavate sediment from facility and install control measures.
- L. Dispose of excavated sediment from facility, spread over slopes in accordance with contours illustrated on the Drawings and stabilize facility with permanent vegetation.

- M. Prepare and submit a certified statement of correct sediment facility volume.
- N. Do not dispose of any excavated sediment into any drainage way which might lead said material off-site onto adjacent downstream properties.

3.03 GROUND COVER

- A. Protect all exposed soils with mulching (temporary measure) and vegetative ground cover (permanent measure).
- B. Install "Curlex", "Bon Terra CS2" or "Ero-Mat" by Verdyol blanket or approved equal on all disturbed slopes having a finished grade of thirty three percent (33%) or greater (3:1) with vegetative cover.
- C. Install "Bon Terra CS1" or approved equal on all disturbed slopes having a finished grade of thirty three percent (33%) or less (3:1) with vegetative cover.
- D. Ground cover consists of temporary seeding on all graded areas which will not receive final grading or permanent planting within three (3) days.
- E. All grassing or planting operations shall include mulching as stabilization until ground cover by planting is effective.
- F. Reseed as required until full vegetative coverage is established.

3.04 MAINTENANCE

- A. Inspect all control elements after each rainfall event and a minimum of every two (2) weeks when no rainfall event(s) occur.
- B. Clear all debris and accumulated sediment from behind barriers when half full so their functional capacity is not reduced during the construction period.
- C. Repair and replace any and all damaged erosion and sedimentation control measures of any kind.
- D. Maintain all erosion, sedimentation, pollution control measures for delivery of correct pond volume for a period of forty five (45) calendar days.

3.05 REMOVAL OF TEMPORARY EROSION CONTROL DEVICES

- A. As soon as permanent vegetative cover is established, Contractor shall remove temporary devices, including sediment barriers, berms, silt traps and similar devices.
- B. Remove all debris resulting from temporary erosion control from Project site.
- C. Control dust from disturbed areas by means of mulching, irrigation, calcium chloride or other method subject to the Architect's review.

End of Section

SECTION 02 280-G

TERMITE CONTROL

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit data indicating chemical to be used and installation instructions.
- B. Submit sample guarantee and bond.

1.2 GENERAL JOB REQUIREMENTS

- A. Comply with pesticide manufacturer's label and labeling specifications and recommendations for all pesticides used and work performed including preparation of substrate, and apply termiticide at the maximum dosage and volume permitted by the label and state and federal regulations. Furthermore, comply with all rules and regulations as set forth under Georgia Law, and enforced by the Georgia Department of Agriculture Structural Pest Control Commission governing pre-construction termiticide applications.
- B. General Contractor shall engage the following professional pest control operator, licensed in accordance with regulations of governing authorities for applying termiticides as a soil treatment solution. Termiticide applicators must comply with all safety requirements of the pesticide manufacturer.
 - 1. Pest Control Services shall be provided by Allgood Services of Georgia, 2540 Lawrenceville Highway, Lawrenceville, Georgia 30044. Contact person is Mr. Gerald Johnson, 770-339-4500.
 - 2. The General Contractor will enter into a written contract with this pest control company for subterranean termite pretreatment services as required by the Georgia Rules of the Structural Pest Control Act. General Contractor shall be responsible for scheduling.
 - 3. Owner has pre-bid unit prices for these services that are included in the General Contractor's Contract.
- C. Pest Control Contractor shall comply with all contractual obligations agreed upon with Gwinnett County Public Schools.

1.3 JOB CONDITIONS AND RESTRICTIONS

- A. Comply with pesticide manufacturer's label and labeling specifications and recommendations for all pesticides used and work performed, including preparation of substrate, and apply termiticide at the

maximum dosage permitted by the label and state and federal regulations, unless directed otherwise in these specifications.

- B. Do not apply termiticides to frozen or excessively wet soils or during inclement weather. Termiticides must not be applied until excavating, filling and grading operations are completed. Only clean fill dirt shall be used to fill or level low lying substrate areas. Bricks, rocks, insulation and cellulose type materials such as scrap wood, paper products and composition products shall not be used as fill material in areas to be covered by concrete slabs or other building components. All buried logs, stumps and other wood objects must be removed from areas to be covered by buildings and building components, such as sidewalks, driveways and paved areas, that are adjacent to buildings.
- C. After the termiticide has been applied, no further excavating, filling, grading or other soil disturbance, are permitted unless the added or disturbed soil is treated as stipulated by these specifications.
- D. Insulating materials must not be laid or applied on the soil along inside perimeter walls until the soil pretreatment application is completed.

1.4 PRODUCT AND SERVICE WARRANTY

- A. The Pest Control Contractor must provide a written, one (1) year re-treatment guarantee against the infestation of subterranean termites. The guarantee must specifically state that if a subterranean termite infestation is discovered during the guarantee period, the Pest Control Contractor will eliminate the termite infestation by properly treating the infested and adjacent areas within 30 days of notification by the Owner's Representative. All re-treatments must be done at no expense to the Gwinnett County Public School System. All premium and reinspection costs for the initial one (1) year period shall be included in the Pest Control Contractor's prices.

1.5 QUALITY ASSURANCE

- A. Do not apply termiticides until excavating, filling and grading operations are completed. The Contractor shall notify, by telephone, the Gwinnett County Public Schools Construction Coordinator and Architect not less than 24 hours prior to the planned soil treatment by the pest control operator contracted to perform said treatment. Prior to treatment, said coordinator shall have the opportunity to observe the site to insure that all cellulose debris has been removed from the foundation trenches, sub-slab fill areas and plumbing access points. All termite treatment shall be done during normal working hours unless approved otherwise, in advance, by the Owner's Construction Coordinator.
- B. Failure to follow contract requirements shall result in the placement of a complete post-construction, subterranean termite treatment to be

performed as specified in the rules and regulations of the Georgia Structural Pest Control Act and paid by the Contractor.

- C. The Gwinnett County Public School System reserves the right to collect soil samples and test concentrates of termiticides used, utilizing the State of Georgia Enforcement Agency or other government agencies or commercial companies as deemed appropriate and as determined by the Gwinnett County Public School System.
- D. All empty termiticide containers will be thoroughly triple-rinsed and left at a designated location at the job site. Under no condition will empty termiticide containers be brought into or removed from the construction site.

II. PART 2 - PRODUCTS

2.1 SOIL TREATMENT SOLUTION

- A. This section of the specification has been pre-bid separately for unit prices. See Paragraph 1.2 for successful bidder. Use only Imidacloprid Termiticide Concentrate - applied as a finished mix concentrate of .05% (110 fl. oz. of Premise .5 sc or 4 packets of Premise 75 wsp. per 100 gallons of water). The use of any other termiticide must be approved in advance by the Owner.
- B. Solutions used for outside perimeter treatments must not be injurious to plants.
- C. All termiticides must be poured into the termite tank and mixed at the construction site under the observation of a representative of the Gwinnett County Public School System. Mixing of chemical products is prohibited.

III. PART 3 - EXECUTION

3.1 EQUIPMENT

- A. All termiticide application equipment, including vehicle and repair tools and parts, must be maintained in good and proper working condition at all times.
- B. Each treating unit - vehicle, hose, etc., must be of sufficient size and capacity to properly apply, as a pretreatment, 1,000 gallons of chemical within five (5) hours, including refill time. The equipment must have a minimum termiticide output, when applied as a coarse spray through 200 feet of hose, of seven (7) gallons per minute. This will generally require a pump of at least three (3) hp and hoses and connectors of at least 3/8" I.D.

- C. Each treating unit must have a minimum tank capacity of 100 gallons and at least 300 feet of hose in segments not exceeding 100 feet each. All hose connections between the reel, hose segments, nozzle gun, etc., must be of the rapid connect/disconnect type.
- D. Vehicles used for pretreatment must be of sufficient size and power to properly maneuver, fully loaded, in typical construction sites with wet, clay soil.
- E. The nozzle gun must be capable of producing a variable output pattern of solid stream to very coarse spray. The coarse spray pattern must have a minimum termiticide output of seven (7) gpm when applied through 200 feet of hose.
- F. The pest control company must have "on-site" the necessary regulation equipment to refill from a fire hydrant. This includes a minimum of 25 feet of 2" diameter fire hose and regulation cut on/off wrenches.
- G. The pest control contractor must have at least one back-up vehicle, properly equipped, available within two (2) hours for emergency use in the event of breakdown or malfunction of the regular designated equipment.

3.2 APPLICATIONS

- A. All treatments must be done strictly in accordance with the pesticide label and the Rules of the Structural Pest Control Act of the State of Georgia.
- B. Surface Preparation: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and foundations.
- C. Slab on grade structures and outside perimeter walls:
 - 1. Horizontal soil surfaces - Apply 1 gallon per ten (10) square feet of .05% Imidacloprid termiticide solution to areas to be covered by concrete interior and attached slabs, to thoroughly saturate the soil surface. If soil compaction, time considerations, or soil moisture conditions dictate, (as determined by the Gwinnett County Public Schools Construction Coordinator) 0.5 gallon of a 0.1% Imidacloprid termiticide solution per ten (10) square feet may be applied.
 - 2. Apply two gallons of termiticide per ten (10) linear feet to all open concrete blocks and other wall voids including perimeter and interior walls.
 - 3. The soil around all potential critical points of entry must be thoroughly saturated, such as areas along both sides of interior

partition walls, around plumbing pipes, electric conduit around interior column footings, and other structures that will penetrate the concrete slab.

4. Allow all termiticide to soak into the soil (no standing puddles) before covering soil with plastic, beginning concrete placement or other construction activities.
 5. If structures are not completed or slabs are not poured the same day of treatment, such treated voids or soil shall be covered with polyethylene sheeting or other water impervious material until such areas are permanently covered.
 6. Exterior perimeter of foundation walls and soil along outside perimeter of foundation walls including sidewalks, entries, etc. must not be treated until all construction grading and landscape work are completed.
- D. Post signs in areas of application warning workers that termiticides have been applied. Remove signs when areas are covered by other construction.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.
- F. Contamination of public and private water supplies must be avoided by taking such precautions as using anti-backflow equipment or procedures to prevent siphonage of pesticide back into water supplies.

IV. PART 4 - INSURANCE REQUIREMENTS AND CONTRACTOR LIABILITY

4.1 HAZARDS

- A. The pest control contractor shall be responsible from the time of his signing the Owner-Contractor Agreement, or from the time of the beginning of the first work, whichever shall be earlier, for all injury or damage of any kind resulting from the work to persons or property, regardless of who may be the owner of the property. In addition to the liability imposed upon the Contractor on account of bodily injury (including death), or property damage suffered through the Contractor's negligence, which liability is not impaired or otherwise affected hereby, the Contractor assumes the obligation to save the Owner harmless and to indemnify and defend the Owner from every claim, expense, liability or payment arising out of or through injury (including death) to any person or persons or damage to property (regardless of who may be the Owner of the property) of any place in which work is located arising out of or suffered through any act or omission of the Contractor or anyone either.
1. Directly or indirectly employed by, or
 2. Under the supervision of any contractor in the prosecution of the work included in this agreement.

END OF SECTION

SECTION 02 514

SITE CONCRETE

PART 1 - GENERAL

1.1 SCOPE

- A. Work described in this section consists of furnishing and installing Portland cement concrete for site improvements including, but not limited to, concrete curb and gutters, ramps, sidewalks, steps, crosswalks, driveways, retaining walls, and other miscellaneous site concrete and appurtenances.
- B. Concrete curbs and gutters shall be standard "L" type with fiber expansion joints every fifty (50') feet and control joints every ten (10') feet. No steel reinforcing is required.
- C. Concrete walks shall be minimum four (4") inches thick and shall have a minimum slope of one (1") inch in eight (8') feet; or as otherwise illustrated on the Drawings. Slopes must be sufficient to avoid ponding of water on any walkway.
- D. Concrete walks shall be constructed with reinforcement as illustrated on the Details on the Drawings.
- E. By submittal of his bid, the Contractor certifies that all means, methods, labor, equipment and materials to complete the satisfactory construction of the Project is included within the contract sum of his bid.
- F. Related work Specified Elsewhere:
 - 1. Reference Section 02 220 Earthwork.
 - 2. Reference Section 05 505 Metal Fabrications.
 - 3. Reference Section 05 520 Handrails and Railings.

1.2 SUBMITTALS

- A. Submit concrete design mix certified by the testing laboratory employed by the Contractor for the mix design based on cylinder check tests verifying the design mix. A submittal package for fibers, if used, must be incorporated with the concrete mix design(s) for approval by the Engineer. The following data must be in the submittal package, independent laboratory tests to ascertain the fibers meet or exceed specifications:
 - 1. Meets ASTM C-1116 Type III, 4.1.3, Standard Specification for Fiber-Reinforced Concrete.
 - 2. Meet ASTM C-1399 Test Method for determining Average Residual Strength of Fiber Reinforced Concrete, >45 psi.
 - 3. Certification that fiber meets all requirements stated in this Specification.
- B. Submit mill certification certifying that cement, sand, aggregate, reinforcing steel and joint materials comply with the requirements of this Specification.

- C. Submit Shop Drawings for review prior to placement showing bending and placing details for steel reinforcing including bar sizes, spacings, bending and tagging identification. Shop drawings submitted after material is installed shall not be reviewed by the Engineer. Covering of steel for which shop drawings have not been reviewed is prohibited. Contractor shall assume total responsibility for steel reinforcing covered with concrete for which shop drawings have not been reviewed.
- D. Submit manufacturers's specifications and product data of proposed formwork ties.
- E. Submit complete manufacturer's catalogue description of all joint materials and curing/sealing materials.
- F. Submit delivery tickets for each load of ready-mixed concrete delivered showing the class and strength of concrete, pounds of cement per cubic yard, maximum size of coarse aggregate, the slump ordered, amount of admixture and time of batching.

1.3 PROJECT CONDITIONS

- A. Installation shall comply with all state and local laws, ordinances, rules and regulations.
- B. Contractor shall obtain all required permits prior to start of construction.
- C. In warm weather concrete placement will not be permitted when, in the opinion of the Engineer, the sun, heat, wind, or limitations of facilities furnished by the Contractor prevent proper finishing and curing of the concrete in accordance with the requirements of these Specifications. The placing, curing and protection of cast in place concrete shall comply with the provisions of ACI 305R.
- D. In cold weather, in addition to other requirements heat, protect and prepare the subgrade to produce a satisfactory subgrade entirely free from frost when the concrete is deposited. Concrete shall not be placed when the ambient temperature is below thirty-five (35) degrees Fahrenheit (2 degrees Centigrade), nor when the concrete without special protection is likely to be subject to freezing temperature before final set has occurred usually at least seventy-two (72) hours. The placing, curing and protection of cast in place concrete shall comply with the provisions of ACI 306R.
- E. Layout surveying shall be performed by a Georgia Registered Land Surveyor employed by the Contractor.
- F. Survey and maintain all Project bench marks, monuments and other reference points, and if disturbed or destroyed they should be replaced by Registered Georgia Land Surveyor at no cost to the Owner.
- G. Provide proper drainage during construction in a manner to prevent damage to the work, adjoining structures and adjoining and downstream property.
- H. Patching parts of a section of work between joints shall not be permitted.
- I. Remove and replace entire damaged sections when matching existing work.

- J. In no instance will the Contractor be compensated for "lost revenue" resulting from his inability to perform work for third parties because he did not finish his work on this Project within the specified Contract Time.

1.4 QUALITY CRITERIA

- A. Employ an independent testing laboratory, experienced and well qualified in the design of concrete mixtures and concrete testing to perform mix design services.
- B. Testing laboratory shall design the proportions to be used prior to construction, for concrete mixtures to attain the unit compressive strengths specified and the workability or plasticity appropriate for the various conditions of concrete use and shall perform all services necessary for the design-of-mix and redesign where changes are made in the aggregates or in the plasticity or workability of the concrete.
- C. Work and materials shall conform to the applicable requirements of Section 500.00 of "The Georgia department of Transportation, Standard Specifications for Construction of Roads and Bridges", 1993 or the latest edition and any supplemental standards and specifications thereto.
- D. Work shall be performed in accordance with ACI 301.
- E. The design, engineering, construction and removal of concrete form work shall be the Contractor's responsibility. Except as specifically called for otherwise herein, all form work shall meet "ACI Standard Recommended Practice for Concrete Form work" (Latest Edition of ACI 347) as a minimum requirement.
- F. Forms shall be constructed and reinforced to ensure that poured concrete is accurately placed to a tolerance of $\frac{1}{8}$ " in ten (10'-0") feet. Verify accuracy with a ten (10'-0") foot straight edge.
- G. Cleaning, bending, placing and splicing reinforcement shall be in accordance with ACI 315 and ACI 318.
- H. All slabs on earth shall be reinforced with welded wire fabric with joints lapped at least one (1) mesh plus two (2") inches and tied if so indicated on the Drawings. An exception to this quality criteria is sidewalks.
- I. Reinforcement shall be tied in splices and intersections and shall be securely held in place with spacers, chairs or other acceptable supports at five (5'-0") foot on center maximum.
- J. Reinforcement shall be free of loose or flaky rust, scale, dirt and ice at the time of concrete placement.

1.5 GUARANTEE

- A. Site Concrete Contractor to provide Owner's Representative a written guarantee that all work is of good quality, free from faults and defects and in conformance with these Specifications; and that if, within one (1) year after completion and acceptance of the Work, any Work or materials are found to be defective, the Contractor will promptly, without cost to the Owner, correct such defective work or materials.

PART 2 - PRODUCTS**2.1 BASE COURSE MATERIALS**

- A. Base course shall be constructed of structural fill or as otherwise illustrated on the Drawings and shall be compacted to 98% Proctor Density.

2.2 CONCRETE

- A. Concrete for combination concrete curb and gutter shall be "Class A" as determined by Gwinnett County Development Regulations.
- B. All other site concrete shall be minimum 3,000 psi concrete at twenty-eight (28) days unless noted otherwise, conforming to Section 03 300-CAST-IN-PLACE CONCRETE. Mix shall be in compliance with ASTM C94. All concrete shall be air-entrained with a minimum of forty-five (45) air. Use #57 size coarse aggregate.
- C. Cement shall comply with ASTM C150 normal Type I specifications.
- D. Aggregates shall comply with ASTM C33.
- E. Concrete shall comply with ACI 318 and ACI 301. Adhere to all jurisdictional code requirements for reinforced concrete.
- F. Ready mixed concrete shall comply with ASTM C94.
- G. Water shall be clean and potable.
- H. No additives shall be used without prior review of the civil or structural engineer.

2.3 REINFORCING STEEL

- A. Reinforcing bars and dowels shall be manufactured from new billet steel of domestic manufacture conforming to ASTM A615, Grade 60, deformed bars with an uncoated finish.
- B. Welded wire fabric shall consist of deformed bars, furnished in flat sheets or coiled rolls with an uncoated finish, and shall conform to ASTM A-185.
- C. Tie wire shall be 16 gauge annealed steel.
- D. Spacers, chairs, bolsters, ties, etc. Shall conform to ACI 315.
- E. Steel bars shall be fabricated as indicated on the Drawings and in accordance with ACI 315.

2.4 REINFORCING MATERIAL

- A. Collated fibrillated polypropylene (CFP) fibrous bundles shall be used as reinforcement in concrete slabs-on-grade (sidewalks) if referenced as so on the Drawings.

- B. Synthetic fibrous reinforcing material shall be 100% virgin polypropylene fibrillated fibers containing no reprocessed olefin materials and specifically manufactured to use as concrete reinforcement. Fibers shall be added at the rate of 1.50 lbs per cubic yard.
- C. The fibers shall conform to ASTM C1116 and have a residual strength of no less than forty-five (45) psi.
- D. Acceptable products shall include "Forta Econo-Net" as manufactured by Forta Corporation, "Procon F" by Nycon, Inc., "Fibermesh 300" by SI Concrete Systems. Similar products of other manufactures shall be subject to Engineer's review.

2.5 JOINT MATERIALS

- A. Expansion joint filler shall be non-extruding and resilient types conforming to AASHTO M-213 or M-153.
- B. Poured joint sealer shall be a hot poured elastic type sealer intended for sealing joints in concrete pavements and shall conform to AASHTO -173.
- C. Expansion joint filler for combination concrete curb and gutter shall be non-extruding bituminous treated fibreboard conforming to ASTM D 1751.
- D. Expansion joint filler for concrete formwork shall be premolded ½" thick, impregnated asphalt fiber strips. Provide where expansion may cause damage.

2.6 CURING AND SEALING MATERIALS

- A. Curing/sealing compound shall be water soluble emulsion type linseed oil base and conform to the requirements for Type 2 compound as specified in ASTM C 309, except that the requirements for the sag test and drying time shall not apply. Curing/ sealing compound shall be "CS-309-25" as manufactured by W. R. Meadows, "Hydrozo Enviro-Seal 20" by Hydrozo, Inc., "Kure & Seal 1315" by NOX-CRETE, "Transguard 4000" by Armolan or approved equal

2.7 FORM MATERIALS

- A. Acceptable Form Materials
 1. Plywood shall be 5/8" thick, mill oil impregnated, edge sealed exterior form type, grade BB-DFPA, concrete commercial standard 45-60 not previously used on any other project.
 2. For exposed surfaces # 1 lumber shall be T & G southern yellow pine S4S lined with minimum ¼" plywood conforming to federal specification LL-H-35.
 3. For unexposed surfaces forms shall be the same as for exposed surfaces, except #2 lumber shall be used.
 4. Metal forms are acceptable.
 5. Forms shall be built of sound lumber and any bevel strips for sign shall be placed as illustrated on the Drawings.
- B. Joints shall be filled with bee's wax, a composition of tallow and cement or taped.

- C. If any forms bulge or show deflection, which in the opinion of the Engineer exceeds the prescribed tolerances, the concrete shall be removed and the work rebuilt.

2.8 FORM TIES

- A. Characteristics
 1. Ties shall have a minimum working strength of 4,000 lbs.
 2. Ties shall be adjustable in length to permit tightening.
 3. Ties shall leave no larger than $\frac{7}{8}$ " diameter impression on finished surface.
 4. Ties shall leave no metal within one (1") inch of finished surface when the tie is removed.
 5. Wire ties are not permitted.

2.9 FORM JOINTS

- A. Construct expansion joints, control joints, construction joints and other joints as indicated on the Drawings. Acceptable key type steel formers shall include :
 1. Vulcan joints.
 2. Burke keyed Kold Joint Form.
 3. Dayton S-Grip-G-20.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Prior to placement of base material, installer shall inspect the site grading and ensure that the sub-grade has been properly placed and compacted, and is ready to receive the base material.
- B. Installer shall also determine that all site drainage, piped site utilities, underground electrical and communications conduits have been installed, tested and accepted by the Engineer.

3.2 PREPARATION

- A. Submit to the Engineer for review all materials to be used in the base and pavements.
- B. Repair subgrade as necessary to provide uniform surfaces.
- C. Spread base material and compact to 98% maximum density and within 1/8 inch of required grade.
- D. Check field density with nuclear density device or other method acceptable to the Engineer.
- E. Set forms on firm foundation, true to grade and securely fastened in place.
- F. No settlement or springing of forms under the finishing machine will be allowed.
- G. Top face shall not vary from a true plane by more than 1/8 inch in ten (10') feet.
- H. Vertical sides shall not vary from a true plane by more than 1/4 inch.

- I. Clean and oil all forms prior to use.
- J. Provide work bridges where necessary for finishing, straight edging, making corrections, etc. to surface after concrete has been screeded.
- K. Bridges shall be rigidly constructed and easily moveable so that they will not come into contact with the concrete.
- L. Check alignment and grade elevations of forms and obtain approval of preparation and form work from Engineer prior to placement of concrete.

3.3 MIXING OF CONCRETE

- A. All materials shall be measured and mixed in a machine. Mixing and transportation shall meet ASTM C94. The materials shall first be mixed dry and the water then added by measurement.
- B. Mixing time shall begin when the water is added to the mix.
- C. Water shall not be added to the mix at the job site except under the direction of the laboratory that designed the mix. The laboratory shall instruct that a fixed amount of cement shall be added to maintain the water/cement ratio if required. The mixer shall be turned fifty (50) revolutions after the addition of water.
- D. A slump test shall be made of any concrete to which water has been added to ascertain that the slump does not exceed five (5") inches for regular mixes and six (6") inches for pump mixes.
- E. A record shall be kept of any concrete to which water has been added and the record shall show the results of the slump test.

3.4 PLACING OF CONCRETE

- A. Transport and place concrete in a manner to avoid segregation and in accordance with ACI 318 and ACI 304.
- B. Concrete having attained initial set or having contained water more than one hour before final placement shall not be used.
- C. Concrete shall not be dropped more than three (3') feet. Greater drops shall be handled with chutes.
- D. Consolidate concrete by spading, vibrating, rodding or tamping. Work concrete around reinforcing, any inserts and into corners. Avoid objectionable segregation. Ensure concrete fills all voids in form work and fully contacts all surfaces. Take measures to prevent honeycombing. Excessive honeycombing shall be grounds for rejecting concrete work.
- E. Construction joints shall be located as illustrated on the Drawings. All construction joints shall be filled with asphaltic filler after concrete is sufficiently cured, unless joints are specified to be treated otherwise.

- F. Control joints on all concrete surfaces shall be located as indicated on the Drawings. Construction methods proposed for use other than those specified or indicated on the Drawings shall be subject to review by the Engineer.

3.5 INSTALLATION OF CONCRETE APRONS/PADS/DRIVES

- A. Thoroughly wet base without puddling prior to placing concrete.
- B. Deposit concrete with a mechanical spreader uniformly over the full width and depth of the pavement. Concrete shall be continuous between transverse joints.
- C. Vibrate the full width of concrete immediately behind the spreader with spud type vibrators at a frequency not less than 700 VPM. Vibration shall be sufficient to thoroughly consolidate the concrete along all forms but shall not continue long enough to cause puddling or an accumulation of grout on the surface.
- D. Protect concrete from contamination with dirt or other debris from workmen's boots, etc.
- E. Finish the surface with a power driven finishing machine equipped with at least two (2) oscillating type transverse strike-off screeds. Hand finishing shall be permitted only in areas of limited access where use of mechanical equipment is impractical, under emergency conditions or with the prior approval of the Architect. Unless otherwise specified, the final finish and texture shall be fine broom finish using a push broom with stiff bristles, perpendicular to the path of travel.
- F. Construct joints of the type and dimensions illustrated on the Drawings. Construct joints in a manner to prevent random or uncontrolled cracking. Should such cracking occur, remove and replace sufficient concrete to form a slab at least 10 ft. long unless directed otherwise by the Owner's Representative.
 - 1. Form transverse expansion joints and fill with continuous joint filler. Provide at thirty (30') foot maximum spacing and at all edges that abut rigid structures or curbing.
 - 2. Tool ¼" wide construction joints with one (1") inch minimum depth at spacing illustrated on Drawings.
- G. After the final finish but before the concrete has taken its initial set, work the edges of pavement along each side of expansion joints, formed joints and construction joints with an approved tool and round to the radius specified. Produce a well-defined, continuous radius and a smooth, dense mortar finish. Do not unduly disturb the surface of the slab by tilting the tool during use. Eliminate tool marks appearing on the slab adjacent to joints. Remove all concrete on top of the joint filler. Test all joints with a straightedge before the concrete has set.
- H. Immediately after completion of finishing operations and as soon as marring of concrete will not occur, the entire surface of newly placed concrete shall be covered and cured. The concrete shall not be left exposed for more than ½ hour during the curing period.
- I. Provide sufficient covering material to cover and properly protect the last hour's pour against the effects of rain. This covering material may be burlap mats, waterproof paper or combined burlap and white polyethylene sheeting. Failure to provide sufficient cover materials or to adequately take care of curing requirements shall be cause for rejection of concreting installations.

- J. When concrete is being placed and the air temperature may be expected to drop below 35 degrees F. a sufficient supply of straw, hay, grass, approved curing paper, or other blanketing material shall be provided along the work, and any time the temperature may be expected to reach the freezing point during the day or night, the material shall be spread over the pavement to a sufficient depth to prevent freezing of the concrete. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather and any concrete damaged by frost action shall be removed and replaced at the Contractor's expense.
- K. As soon as the concrete has hardened sufficiently, the pavement surface will be tested by the Engineer with an approved 10-foot rolling straightedge capable of marking the deficient areas by suitable means. The rolling straightedge shall be furnished by the Contractor.
- L. Where the surface deviation in ten (10') feet exceeds 1/4 inch, the pavement shall be removed and replaced by, and at the expense of the Contractor.
- M. Unless otherwise provided, do not remove forms from freshly placed concrete until it has set for at least twelve (12) hours and then:
1. Remove forms carefully to avoid damage to the pavement.
 2. After forms have been removed, cure the sides of the slab and fill minor honeycombed areas with mortar.
 3. Major honeycombed areas will be considered as defective work and shall be removed and replaced.
 4. When it is necessary to remove and replace a section of pavement, any remaining portion of the slab adjacent to the joints that is less than ten (10') feet in length shall also be removed and replaced.
- N. Engineer shall inspect and approve each joint for proper width, depth, alignment and preparation for sealing before sealing is allowed.
1. The pavement may be opened for traffic prior to sealing provided the joint forming device or insert has not been removed or sawed.
 2. When the insert is removed or sawed the pavement may be opened to traffic provided the joints are protected during the interval between sawing and sealing.
 3. Protection of the joints shall be accomplished by placement of a backup material immediately after sawing or removal of insert.
 4. Thoroughly clean joints immediately prior to sealing.
 5. Acid and/or pressure wash concrete prior to sealing if the concrete has been subject to traffic.
 6. Apply the sealant as soon as possible after the required curing of the concrete.
 7. Sealant shall be installed in strict accordance with manufacturers printed installation instructions.
 8. Traffic shall not be permitted while sealing and until after the sealant is cured.
 9. The pavement shall be closed to all traffic for sealing for a minimum of one (1) day.
 10. Joints shall be reasonably free of spalls, fractures, breaks and voids.
 11. Areas requiring repairs shall be chipped back to sound concrete and repaired with an acceptable non-shrinking patching system in accordance with the manufacturer's recommendations.
 12. Prepare and install joint sealants in accordance with the manufacturer's recommendations.

13. The sealant shall be installed to a depth of 1/4 inch (\pm 1/8 inch) below the pavement surface or in accordance with the Drawings.
- P. Protect the pavement and its appurtenances against both public traffic and traffic of Contractor's employees and agents.
- Q. Any damage to the pavement occurring prior to date of final completion shall be repaired or the pavement shall be replaced at no cost to the Owner.

3.6 INSTALLATION OF SIDEWALKS

- A. Place the 100% virgin polypropylene fibrillated fibers reinforcing material in accordance with the Details illustrated on the Drawings and the Manufacturers recommendations.
- B. Excavate drain pockets for all weep holes and fill with coarse aggregate. Provide pipes, sleeves, or formed openings as Illustrated on the Drawings.
- C. Place concrete in a manner to avoid segregation. Spread to the full width and depth of forms and bring to grade by screeding and straight edging.
- D. Give sidewalks a fine broom finish using a push broom with stiff bristles, perpendicular to the path of travel with two (2") inch smooth trowel edges as illustrated on the Drawings.
- E. Final surface shall not vary from a true plane by more than 1/4" in ten (10') feet.
- F. Sloped paving may be either in horizontal or vertical courses but not a mixture.
- G. Horizontal courses shall be three (3') feet to six (6') feet in width.
- H. Provide vertical contraction or construction joints at thirty (50') foot intervals. Vertical contraction joints shall be 1/3 the thickness of the concrete..
- I. Provide 3/4" deep transverse grooves for sidewalks as illustrated on the Drawings, finished with a 1/4" edging tool.
- J. Provide one-half inch(1/2") wide premolded expansion joints shall be at fifty (50') foot intervals and at all curbs and rigid structures.
- K. Fill expansion joints with premolded asphaltic joint filler and cut off any protruding material flush with the finished concrete.
- L. Provide proper curing for the sidewalks using liquid curing/sealing compound.
- N. Thoroughly clean all joints immediately prior to sealing and acid and/or pressure wash concrete prior to sealing as directed by Architect.
- O. Apply sealant as soon as possible after required curing period of concrete.
- P. Prohibit traffic on sealed surfaces until sealer has cured.

- Q. Provide sealer for all sidewalks and apply in accordance with manufacturer's recommendations.

3.7 INSTALLATION OF COMBINATION CONCRETE CURB AND GUTTER

A. General:

1. Use metal forms unless otherwise specifically authorized by the Engineer, except that on curves having a radius of one-hundred, fifty (150') feet or less, wood forms may be used.
 2. All forms shall be reviewed by the Engineer.
 3. Form setting:
 - a. Subgrade under forms shall be compact and cut true to grade, so that the forms will be firmly in contact with it for their entire length..
 - b. Correct imperfections and variations of the grade in a manner satisfactory to the Architect.
 - c. Join each form section tightly by locked joints, free from play or movement in any direction.
 - d. Check conformity to alignment and grade elevations illustrated on the Drawings and make necessary corrections prior to placing the concrete.
 - e. Coat forms with oil each time they are used.
 4. Removal:
 - a. Keep forms in place at least twelve (12) hours after concrete has been placed against them or for a longer period if so directed by the Engineer.
 - b. Do not use crowbars or other heavy tools against green concrete in removing the forms.
 - c. Clean forms well before re-oiling and reuse.
- B. For finishing test the subgrade for elevation and density in advance of placing the concrete. Correct any discrepancies in accordance with the requirements for subgrade preparation.
- C. Tamp and space the concrete so as to produce a dense concrete in which the mortar has been worked to the surface
- D. Strike off the concrete to the required cross-section and smooth the upper face of the gutter slab and the front face and top of the curb with a wood float.
 1. Use an edging tool on all exposed corners.
 2. When completed, surface of the curb and gutter shall be straight and true, and shall conform to the shape and dimensions illustrated on the Drawings.
 3. Remove face forms as soon as possible and finish the exposed surface with a first class wood float finish.
 4. Workmanship and appearance shall be of the highest quality.
- E. Provide $\frac{3}{4}$ " deep, $\frac{1}{4}$ " wide construction joints for curbs and gutters at ten (10') foot intervals, and $\frac{1}{2}$ " expansion joints at fifty (50') foot intervals, at all tangent points, and at all rigid structures. Tool all exposed edges and joints to $\frac{1}{4}$ " radius.
- F. Fill expansion joints with premolded asphaltic joint filler and cut off any protruding material flush with the finished concrete.

3.8 INSTALLATION OF RETAINING WALLS

- A. The design and engineering of the formwork, as well as its construction shall be the responsibility of the Contractor.
- B. Construct forms to slopes, lines and dimensions indicated on the Drawings, plumb straight and sufficiently tight to prevent leakage.
- C. Securely brace and shore forms to prevent displacement.
- D. As necessary, provide access openings for cleaning and inspection prior to depositing concrete.
- E. Do not coat forms with material that will stain or cause damaged to exposed concrete surfaces or to finish material applied directly to concrete.
- F. Chamfer external corners of all exposed concrete as noted on the Drawings or as directed by the Engineer.
- G. Provide for installation of any inserts, conduits, pipe sleeves, drains etc.
- H. Allow sufficient time between form erection and placing of concrete for proper installation of any works by various trades.
- I. The inside surface of wood board forms shall be soaked with clean water prior to placing of concrete.
- J. Plywood or pressed wood forms, except as otherwise specified within shall be treated with an approved form oil or lacquer. Wipe off excess oil with rags leaving surface of forms just oily to touch. Do not oil forms where finish material is to be applied directly to concrete.
- K. Steel reinforcement shall be protected by concrete cover as indicated on the Drawings.
- L. Install any welded wire mesh reinforcing, size as indicated on the Drawings, at mid-height of the concrete slab on grade. Lap all joints 8" and extend mesh to within 1" of the sides and end of slabs.
- M. Provide adequate notice to Engineer to provide sufficient opportunity for review of the placement of reinforcing steel before concrete is placed
- N. Remove forms in accordance with requirements outlined in ACI 318 in a manner to ensure complete safety of the retaining wall. Remove forms only after concrete has hardened sufficiently to avoid injury to surfaces. Minimum curing time prior to form removal shall be 24 hours. After removal of forms, notify the Engineer for review of newly stripped surfaces. Do not patch or touch up newly stripped surfaces until after review by the Engineer.

3.9 PROTECTION AND CURING

- A. Protect and cure concrete as specified in the concrete standard ACI 301.
- B. Apply curing compound in accordance with the manufacturers recommendations.

3.10 PATCHING FORMED SURFACES

- A. Do not patch or touch-up newly stripped surfaces until after review by the Engineer. Concrete which in the opinion of the Engineer, exhibits excessive defects shall be condemned and removed from the site at the Contractor's expense and replaced at no additional cost to the Owner.
- B. All surfaces shall be patched to fill all the holes and correct minor honeycombing and other defects 1½" or less in any dimension the same working day the forms are removed. Concrete with larger defects shall be replaced at no additional cost to the Owner to the extent designated by the Engineer.
- C. Wet the areas to be patched and thoroughly brush into the surface a grout coat of cement and sand following immediately with application of patching mortar.
- D. Patching mortar shall be of a consistency similar to concrete mix except coarse aggregate shall be omitted.
- E. Compact patching mortar into place and screed off leaving patch slightly higher than surrounding surface.
- F. Allow patch to set until after initial shrinkage and then finish to match adjoining surface.
- G. At the Contractor's option, a bonding agent may be used to bond patching material to concrete.
- H. Unexposed surfaces shall have the rough edges and projections broken off.
- I. All exposed exterior concrete, including curbs and gutters, exterior retaining walls, stairs, ramps exposed slab edges, etc., shall have a rubbed finish. After forms are removed, smooth out work joint and remove blemishes. Imperfections shall not exceed 1/16" in any dimension. While concrete is still slightly green, remove and repair projections, offsets and blemishes. Wet surface thoroughly and rub with cement or carborundum bricks and water until uniformly smooth.

3.11 INSTALLATION OF PEDESTRIAN HANDRAILS/GUARDRAILS

- A. Make field measurements of sleeve locations prior to manufacture of pedestrian handrails and guardrails.
 - 1. All pedestrian handrail and guardrail posts shall be set in minimum eight (8") inches long galvanized pipe sleeves and anchored with "Porox" or equal.
 - 2. Posts shall be placed as illustrated on Drawings.
 - 3. Handrail to be mounted at twenty-five (25") inches and thirty-four (34") inches from pavement surface.
 - 4. Guardrail to be mounted at forty-two (42") inches from top of wall or pavement surface.
 - 5. Ends of handrail to be extended twelve (12") inches beyond limit of handicap ramp and extension shall be parallel with finished grade elevations at end of ramp.
 - 6. Guardrail to be used at all locations of walls where elevations of top of wall and finish grade differ more than 2'-6".

3.12 FIELD QUALITY CONTROL

- A. Concrete testing shall be performed by a Testing Agency selected and paid for by the Owner. All costs related to tests which yield unacceptable values shall be borne by the Contractor. All costs related to any re-testing shall be borne by the Contractor.
- B. Notify the Testing Agency twenty-four (24) hours prior to placing any concrete.
- C. Provide a secure area for performing concrete tests and forming and storage of test specimens. Samples shall be procured in accordance with ASTM C172 and cylinders shall be made in accordance with ASTM C31. Samples shall be transported to a testing laboratory for curing and testing. All handling and testing of samples shall be in accordance with ASTM C-39.
- D. Take job control sample specimens of the concrete in cylindrical containers at the point of deposit. The following tests are required as a minimum:
 - 1. Slump Tests - One (1) test per each twenty (20) cubic yards in accordance with ASTM C142-78.
 - 2. Compressive Tests - Four (4) cylinders for each test in accordance with ASTM C39-84. One (1) cylinder shall be broken at seven (7) days and two (2) shall be broken at twenty eight (28) days. An average of the twenty eight (28) day breaks shall be considered one (1) test.
 - 3. One (1) cylinder shall be held and broken at fifty-six (56) days only if test fails to meet specification.
 - 4. Air entrainment for applicable classes of concrete in accordance with ASTM C231.
- E. Frequency of testing:
 - 1. One sampling consisting of four cylinders, shall be made from each pouring operation and not less than one sampling for each fifty (50) cubic yards of concrete poured each day. Take and cure samples in accordance with ASTM C-31.
 - 2. The cylinders shall be transported to a testing laboratory for curing and testing. Handle and test samples in accordance with ASTM C-39.
 - 3. Perform air entrainment tests for each set of cylinders of air entrained concrete.
 - 4. Perform unit weight tests in accordance with ASTM 567.
- F. Take depth of slab measurements on pavement by probing the plastic concrete immediately behind the paver device. Take measurements at twenty (20') foot intervals and at three (3) points across the width of the concrete slab.
- G. All concrete test reports shall include slump test, specific statement of where concrete is located in the structure, statement of number of yards of concrete emptied at test, total number yards of concrete in truck, air temperature and time.
- H. Record results and forward to the Owner, Engineer and Contractor. Make air and slump determination at a frequency sufficient to ensure concrete quality. Testing Agency shall notify the Engineer, Owner and Contractor if test reports indicate abnormalities.

3.13 PROCEDURES FOR TEST RESULTS

- A. The results of the concrete tests shall be evaluated in accordance with Paragraph 17.2 of ACI Standard 301.

- B. If evaluation of the compressive test indicates that the concrete has failed to meet the specified strength, core tests shall be made in the in-place concrete. The location and number of such tests shall be determined by the Geotechnical Engineer. Tests shall be paid for by the Contractor.

- C. If the core tests fail to verify the strength specified, the Engineer shall effect one of the following procedures:
 - 1. Have the Contractor remove and reconstruct that portion of the structure found to be defective.
 - 2. Accept concrete in-place and issue a change order as set forth in the General Conditions of Contract of these Specifications for a credit value to be agreed upon by the Owner, the General Contractor and the Engineer.

- D. Concrete testing shall be back charged to the Contractor if specified strength is not obtained.

3.14 CLEANING

- A. Portland cement concrete paving, curbs and sidewalks shall be acid washed and/or pressure washed at Substantial Completion by the Contractor if required by the Architect to achieve the desired appearance.

End of Section

SECTION 02 581

TACTILE WARNING STRIPS

PART 1 - GENERAL

1.01 SUBMITTALS

- A. Submit manufacturer's literature indicating product description and characteristics, including compliance with specified requirements and manufacturer's recommended maintenance instructions. Mark manufacturer's brochures to include only those products proposed for use.
- B. Submit proof of acceptability of proposed materials to the Gwinnett County Fire Marshall for acceptance.
- C. Submit 2" x 2" sample of manufacturer's specified color on applicable substrate available for Architect's review.
- D. Submit a shop drawing which illustrates the location and dimension of scored, colored concrete warning strips at wheelchair ramps and/or surface applied inline tiles.
- E. Submit proof of acceptability of location and dimensions of proposed tactile warning strip(s) to the Gwinnett County Fire Marshall for acceptance.

1.02 DELIVERY, STORAGE AND HANDLING

- A. Delivery and Handling
 - 1. Deliver materials to the Project site with manufacturer's labels intact and legible.
 - 2. Handle materials with care to prevent damage.
 - 3. Install no material which becomes damaged during handling.
- B. Storage
 - 1. Store materials inside, under cover and off the ground in accordance with manufacturer's printed instructions.
 - 2. Store concrete color agents in dry area.

PART 2 - PRODUCTS

2.01 TACTILE WARNING STRIPS

- A. All products shall be acceptable to Gwinnett County Fire Marshall and /or the Georgia State Fire Marshall.
- B. Exterior Tactile strip concrete coloration material shall be as approved by Georgia DOT and Gwinnett County D.O.T.

- C. Provide all tools, equipment and accessories necessary for a proper installation of tactile warning strips.
- D. Exterior surface applied inline dome tiles shall be as approved by Georgia DOT, Gwinnett County Fire Marshall and Engineers Department.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Allow exterior concrete to cure in accordance with manufacturer's instructions prior to applying warning strip coloration to concrete surfaces.
- B. Remove all dirt, oil, grease and other foreign matter from surfaces to receive tactile warning strip coloration.
- C. Prime surface as recommended by manufacturer.

3.02 APPLICATION

- A. Apply tactile warning strips and/or tiles in accordance with manufacturer's printed instructions.
- B. Apply strips and/or tiles only to areas specified herein and on the Drawings.
- C. Protect freshly-applied tactile warning strips and tiles from traffic for maximum length of curing time specified by Manufacturer.

End of Section

SECTION 02 720

STORM DRAINAGE

PART 1 - GENERAL

1.01 SCOPE

- A. Storm water runoff shall be collected in area drains, catch basins, curb inlets etc. and piped underground through a primary storm water drainage system to a existing storm storm drainage system.
- B. Roof water runoff shall be collected by a gutter and down spout system on the building and then transferred through a secondary storm water drainage system to the primary storm drainage system.
- C. Fine grading to direct surface storm water runoff to the primary and secondary storm water drainage systems described below. Reference Section 02 200.
- D. By submittal of his bid, the Contractor certifies that all means, methods, labor equipment and materials to complete the satisfactory construction of the project is included within his bid.

1.02 DESCRIPTION OF WORK

- A. Work described in this section includes, but is not limited to, construction of primary and secondary storm sewers, drainage structures, and drainage appurtenances.
- B. Contractor is responsible to complete, submit and secure any Certificate of Development Compliance or equivalent documentation required in connection with all the storm drainage systems as may be required by any Department of Gwinnett County or any agency of the State of Georgia.
- C. Related Work Specified Elsewhere:
 - 1. Reference Section 02 050, Demolition.
 - 2. Reference Section 02 200, Earthwork.
 - 3. Reference Section 02 270, Erosion and Sediment Pollution Control.
 - 4. Reference Section 02 514, Site Concrete.

1.03 SUBMITTAL

- A. Product data: Submit for each type of piping material, prefabricated structure, castings and trench drain. Indicate product descriptions and installation procedures.
- B. In the event that storm water drainage systems and structures are not maintained during the construction process to the satisfaction of the Architect, an interim "as built" may be required to establish the extent of deficiencies. All costs associated with an interim "as built" will be borne by the Contractor.

- C. For each type of Cast-In-Place Concrete Structure the Contractor will furnish a detailed Shop Drawing illustrating the structure. Shop Drawing will also illustrate the reinforcement proposed in the structure sized to accommodate the structure and any load bearing on it. This information is required regardless of the Details and information provided on the Drawings.
- D. During the Bid Phase of the Project, the Contractor is responsible to carefully examine the Storm Water Management System and relay questionable and/or conflicting information illustrated on the Engineer's Drawings to the Architect in the format of a Request for Information (RFI). Examples of such issue might include conflicting pipe to structure dimensional information, vertical conflicts, the ability to construct structures, systems or devices or the overall Design Concept of the Storm Water Management System. The Engineer (through the Architect) will clarify such issues by Addenda during the Bid Phase of the Project.

1.04 QUALITY ASSURANCE

- A. Industry standards: Standards for the following, as referenced hereinafter.
 - 1. American Society for Testing and Materials (ASTM).
 - 2. American Concrete Institute (ACI).
 - 3. Georgia Department of Transportation, "Standard Specifications or the Construction of Roads and Bridges", 1993, or latest edition, hereinafter referred to as Georgia DOT Specifications and any Supplemental Specifications thereto.
 - 4. Gwinnett County Storm Water Management Regulations - Latest Edition.
- B. Work implied here shall be performed by a Contractor and/or his sub-contractor qualified to perform such work in Gwinnett County and licensed by the State of Georgia. Provide Certificate of Qualification to Architect.

1.05 GUARANTEE

- A. Guarantee the construction of all primary and secondary storm drainage systems for a period on one (1) year from the date of Substantial Completion.

1.06 PROJECT CONDITIONS

- A. In no instance will the Contractor be compensated for "lost revenue" resulting from his inability to perform work for third parties because he did not finish his work on this Project within the specified Contract Time.
- B. Final payment will not be paid until the Owner receives copies of approved "As-Built(s)" and the approved Gwinnett County CDC.

PART 2 - PRODUCTS

2.01 PIPES

- A. Contractor will use for the primary storm water drainage system either Aluminized Corrugated Steel Pipe (ACCOMP), Reinforced Concrete Pipe (RCP), Aluminized Steel, Type 2 (AST2) Galvanized Corrugated Steel Pipe (GCSP), Smooth Interior Corrugated Polyethylene Pipe (HDPE) or a combination of them.

- B. Smooth Interior Corrugated Polyethylene Pipe (HDPE) will not be used for primary storm water systems under bus drives, service drives, automobile and bus parking areas, parent pick-up drives etc.
- C. Primary storm water sewer pipes will be of the type, size, class or gauge, and material illustrated on the Drawings in plan and profile and as specified on the Pipe Chart.
- D. Contractor will only use (PVC) Pipe & Fittings for the secondary storm water drainage system as illustrated on the Drawings. To be used up to a maximum of five (5) feet outside of buildings to intercept roof drainage down spouts and transmit the roof run-off to the primary system as illustrated on the Drawings. Cleanouts to the secondary system will be provided where illustrated on Drawings.

2.02 PIPE MATERIALS

- A. Aluminized Corrugated Steel Pipe (ACCOMP) shall conform to Georgia DOT Standard Specifications, Min. Class I or II pipe, and shall meet the requirements of AASHTO: M 36.
- B. Reinforced Concrete Pipe (RCP) and Flared End Sections (FES) shall conform to Georgia DOT Standard Specifications Section 843.01, Min. Class III pipe for pipes up to fifteen (15') feet of cover, Min. Class V for pipes over fifteen (15') feet of cover, and shall meet the requirements of AASHTO: M 170 and/or ASTM C-76. Class and wall thickness shall be in accordance with Standard Detail 1030D Georgia DOT Specification Table 1. All pipe joints shall be bell & spigot with a rubber gasket conforming to ASTM C-443.
- C. Aluminized Steel, Type 2 (AST2) pipe shall conform to Georgia DOT Standard Specifications Section 844.08, and shall meet the fabrication requirements of AASHTO: M 36 or ASTM A760. The steel sheet used in the fabrication shall conform to the requirements AASHTO: M 274 or ASTM A 929. The outside and inside surfaces of the corrugated metal pipe shall be aluminized. Coupling bands shall be corrugated, galvanized, and aluminized hugger type with a two bolt or more connector. Bolts shall be ½" diameter and galvanized. Coupling bands shall be the same thickness as used for the pipe.
- D. Smooth Lined Corrugated Polyethylene Pipe (HDPE) shall conform to Georgia DOT Standard Specifications Section 845.00, and shall meet the requirements of AASHTO: M 294 Type S or AASHTO MP7. The coupling bands shall engage two full corrugations on each pipe section and rubber gaskets conforming to ASTM F-477 will be required for all joints.
- E. PVC Schedule 40 Pipe & Fitting, shall conform to Georgia DOT Standard Specifications Section 847.08, and shall meet the requirements of AASHTO: D 3034 (SDR 35). Joints shall have elastomeric seals which conform to the requirements of ASTM F 477.
- F. Galvanized Corrugated Steel Pipe (GCSP) shall conform to Georgia DOT Standard Specifications Section 844.00, and shall meet the requirements of AASHTO: M 36.

2.03 CONCRETE, MASONRY AND ACCESSORY MATERIALS

- A. Concrete:
 - 1. 3,000 psi compressive strength, in accord with Division 3, Concrete, including form work, reinforcement and finish.

2. Concrete must meet Georgia DOT Specifications, Section 500.00.
- B. Manhole Brick:
1. Meeting ASTM C32-73, Grade MM.
 2. Bricks must meet Georgia DOT Specifications, Section 834.00.
- C. Mortar and Grout:
1. Meeting ASTM C270-80, Type M.
 2. Mortar must meet Georgia DOT Specifications, Section 834.03.
- D. Construction Castings:
1. Meeting ASTM A48-76, grey cast iron.
 2. Castings must meet Georgia DOT Specifications, Section 854.00
- E. Manhole Steps:
1. Meeting ASTM A48-76, Class 30B, integrally cast into manhole sidewalls.
- F. Gravel Fill:
1. Shall consist of sound, durable rock, free from injurious amounts of coatings of any kind and shall be graded so 100% passes the 1-½" sieve, 95-100% passes the 1" sieve, 25-60% passes the ½" sieve, 0-10% passes the No.4 sieve and 0-5% passes the No.8 sieve.
 2. All stone for Gravel Fill shall meet the quality requirements of Section 800 of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
- G. Granular Bedding and Backfill Material:
1. Shall consist of a granular soil, sand, chert, crushed stone or mixture of these, all of which passes a ¾ inch sieve, 80% passing a ⅜ inch sieve, 40% passing a No.4 sieve, 10% passing a No. 8 sieve, and not more than 5% passing a No. 16 sieve.
 2. Material shall be free of organic matter and debris. All stone for Granular Bedding shall meet the quality requirements of Section 800 of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
- H. Plain Rip Rap:
1. Shall meet the quality requirements of Section 805 of the State of Georgia Department of Transportation Standard Specifications for Construction of Roads and Bridges, 1993 or latest Edition.
 2. Material shall be processed such that the largest pieces have a volume of not more than two (2) cubic feet and not more than ten (10%) percent of the total weight of rip rap shall consist of spalls passing a five (5") inch sieve.
 3. Stone for Rip Rap shall be sound, durable pieces and shall be resistant to the action of air and water.
 4. Flat, slabby and shaley pieces are not acceptable.
 5. Stone shall be clean and essentially free of rock dust and fines.
- I. Precast Concrete Manholes:
1. Meeting ASTM C478-79, concentric cone type and Georgia DOT Specifications Section 866.00.

- J. All structures whether pre-cast or brick shall meet or exceed the requirements of the Georgia Department of Transportation Standards and Specifications.

PART 3 - EXECUTION

3.01 CONSTRUCTION OF DRAINAGE SYSTEM

- A. Excavation, bedding, filling and compaction for construction of drainage system shall be in accordance with Section 02 200, Earthwork.
- B. Laying of pipe on top of soil and then backfilling around the pipe is inconsistent with the Design Concept and will not be permitted. Any such "construction" will be disassembled and redone. No payment will be made to the Contractor for such inconsistent work.
- C. Inspect piping prior to placing in trenches. Do not install defective or damaged piping.
- D. Lay piping beginning at low point of the drainage system with joints lapped upgrade. Lay in proper alignment and to slopes indicated, fully supported on firm subgrade.
- E. Clean interior of piping of dirt and debris as work progresses. Place plugs in the ends of uncompleted piping at the end of each work period. Continue to flush lines between manholes and drainage structures as required to remove collected debris until permanent vegetative cover has been established.
- F. Lengths of storm drain pipe illustrated on the Drawings are approximate distances center to center of structures. The Contractor is responsible for all pipe quantities to convey storm drainage to points indicated in accordance with the design concept illustrated.
- G. All drainage piping shall have watertight joints and all structures shall be watertight joints.
- H. Smooth Lined Corrugated Polyethylene Pipe (HDPE) shall be installed in accordance with ASTM recommended practice D-2321, AASHTO Section 30, or with Section 550 of the Georgia DOT Standard Specifications.
- I. Aluminized Corrugated Steel Pipe (ACCOMP) shall be installed in accordance with Section 550 of the Georgia DOT Standard Specifications.
- J. Reinforced Concrete Pipe (RCP) shall be installed in accordance with Section 550 of the Georgia DOT Standard Specifications.
- K. Aluminized Steel, Type 2 (AST2) pipe shall be installed in accordance with Section 550 of the Georgia DOT Standard Specifications, and in accordance with AASHTO Standard Specifications for Highway Bridges, Section 26, Division II or ASTM A 798..
- L. PVC Schedule 40 Pipes & fittings shall be installed in accordance with ASTM recommended practice D2321.

3.02 CONSTRUCTION OF DRAINAGE STRUCTURES

- A. Construct catch basins, drop inlets, headwalls and similar structures of reinforced concrete unless otherwise indicated; manholes of masonry, concrete or precast units at Contractor's option.
- B. Provide concrete foundations for manholes and other structures as indicated on Drawings.
- C. All drainage structures shall have paved (mortar) inverts.
- D. Concrete structures shall be reinforced whether indicated on the Drawings or not.
- E. Concrete construction shall receive a smooth formed finish in accord with ACI-301-72 on all surfaces exposed to exterior or interior of structure; rough formed for all unexposed construction.
- F. Moist cure concrete for a minimum of seven (7) days after placing.
- G. Mix mortar with only enough water for workability. Retempering of mortar will not be permitted.
- H. Keep mortar mixing and conveying equipment clean. Do not deposit mortar upon or permit contact with ground.
- I. Lay masonry in full mortar bed with ends and with full vertical joints, not more than 5/8" wide. Protect fresh masonry from freezing and from too rapid drying.
- J. Apply a 1/2" thickness mortar parge coating on interior and exterior of masonry walls surfaces.
- K. Set tops of frames and covers of manholes flush with finished surface.
- L. Set drainage gratings to elevations indicated on the Drawings.
- M. Remove any lifting rings after structure installation.
- N. Grout all structured inverts.
- O. Take notice of , coordinate and clarify "top" elevations versus "flow line" elevations prior to construction of all catch basins, drop inlets, yard inlets, etc.
- P. For any final grade adjustment up to one (1') foot use precast concrete grade rings or brick courses .

3.03 "AS-BUILT" RECORD DRAWINGS

- A. Employ the services of an independent Registered Land Surveyor (R.L.S.) for the "As-Built" Record Drawings. The R.L.S. will hold active licensure and registration in the State of Georgia. Contractor shall establish a relationship with this R.L.S. so that he may assist the Contractor with the entire process of preparing the required "As-Built" Record Drawing(s) in such a manner that it will be consistent with the requirements of Gwinnett County Department Storm Water Management Division. The R.L.S. and the Contractor will together assess and correct

inconsistent construction of the "Primary" and "Secondary" Storm Water Systems rendering the built construction consistent with the Design Concept, Drawings and Specifications.

- B. "As-Builts":
1. At his expense, Contractor shall provide the Owner with two (2) hard copies and one (1) digital copy in Autocad Release (Format to be approved by Gwinnett County) of an "As-Built" record drawing plan of all primary and secondary storm sewers and all underground utilities. "As-Built" shall show:
 - a. All contours and elevations.
 - b. Vertical and horizontal location (i.e. in plan and profile) of each pipe, structure or other utility line with dimensions illustrated to the buildings, curb lines, walls, walks, and other above ground built appurtenances after construction is complete.
 - c. Date of record survey.
 - d. Georgia Registered Land Surveyors seal and signature.
 - C. Said "As-Builts" and any corrections or amendments to them are a part of the Contractor's responsibility in meeting the requirements for securing any Gwinnett County Certification of Development Compliance.
 - D. All the record documents information, corrections and/or amendments required by Gwinnett County Department of Planning and Development shall be included in the Contract with no additional cost to Owner.

3.04 CLEANING AND INSPECTION

- A. In addition to the "As-Built" survey defined above the Contractor shall conduct certain post construction activities to ensure that the total storm water sewer system is functioning as intended, all costs to be included in the Contract sum.
- B. Cleaning of Storm Water Sewer System: It is the, intent, that upon the completion of all construction activities and prior to the occupancy of the School Building(s) that the Contractor thoroughly clean out all pipe lines comprising of the total storm water sewer system to ensure that the lines are clean and free from all construction and soil type materials.

End of Section

SECTION 02 831

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 AREAS OF FENCING

- A. Types of fencing shall be as specified in paragraph 2.01 below and shall be designated for installation as follows:
 - 1. Playfield fencing shall be galvanized as specified herein or for other designated areas as directed by the Owner.
- B. All playgrounds shall be fenced and shall have two (2), four (4'-0") foot wide lockable, pedestrian access gates.

1.02 PROJECT CONDITIONS

- A. Playfield:
 - 1. Fencing shall a fabric height of six (4) feet.
 - 2. Fabric shall be continuous vinyl coated, galvanized chain link, seven-two (72") inches high, nine (9) gauge woven wire with barbs turned down.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Store materials off the ground.
- B. Handle materials in a way which prevents dents, bends, and scars. Replace materials which are damaged prior to Substantial Completion.

1.04 QUALITY CRITERIA

- A. Work shall be performed by skilled mechanics experienced in fencing erection.
- B. Fence shall be erected plumb, on line, properly tensioned and securely fastened.
- C. Locate to completely surround and enclose construction activity area, construction parking, storage areas, permanent storm detention pond enclosure, and as listed below or shown on Drawings.

PART 2 - PRODUCTS

2.01 FENCING

- A. Fencing (Galvanized): fence and gates for playgrounds or as otherwise indicated on the drawings shall have a fabric height of four (4) feet with top rail and barbs turned down.
 - 1. Fabric: Fabric shall be continuous vinyl coated galvanized chain link 48" high 9 gauge woven wire with barbs turned down.

2. Posts: All posts used in the construction of this fence shall be hot-dipped galvanized schedule 40 pipe conforming to ASTM A-120 or SS-40 with a zinc coating of 0.9 oz./sq. ft. with a chromate conversion coating and then a polyurethane acrylic coating of no less than 0.3 mils dry film thickness. The SS-40 shall also have a zinc rich interior coating of not less than 0.3 mils dry film thickness.
3. Terminal Posts: Terminal, corner and pull posts shall be 2½" O.D. Schedule 40 pipe weighing 3.116 lbs./lin. ft. Terminal posts shall be installed at every point that fence changes grade or turns a corner.
4. Line Posts: Intermediate line posts shall be Schedule 40, 1⅝" O.D. pipe, weighing 2.27 lbs./lin. ft. or 1⅝" O.D. pipe weighing 3.117 lbs./lin. ft. All line posts to be evenly spaced at maximum spacing of 10'-0" O.C.
5. Top Rail: Top shall be 1⅝" O.D. Schedule 40 pipe weighing 2.27 lbs./lin. ft. or 1⅝" O.D. SS-40 pipe weighing 1.345 lbs./lin. ft. All joints to be swedge type. Top rails shall pass through line post tops and be fastened to terminal posts by pressed steel connectors. Top rail shall be kept parallel to ground - uneven top rail will not be accepted.
6. Bottom Wire shall be 6 gauge galvanized. Bottom rail shall be kept parallel to the ground and at least 1½" from the ground - uneven bottom will not be accepted.
7. Fabric Connections: Fabric shall be fastened to terminal posts with 3/16" x 3/4" tension bars with 11 gauge 7/8" wide steel bands fastened at 16" O.C. Fabric shall be fastened to line posts and top rails with tie wires of aluminum alloy of 0.144 inch diameter. Line posts to be tied at intervals not exceeding 15" and top rails not exceeding 24".
8. All terminal, corner, and pull post to be of sufficient length to extend 24" into a 8" diameter concrete footing and all line posts shall be set in concrete footings with a depth of 18" and diameter of 6".
9. Miscellaneous fittings shall be furnished as needed and shall be galvanized at no cost to the Owner.

2.02 DRIVE AND PASSAGE GATES

This section includes provision for the installation of drive and passage gates as specified below.

- A. Single Walk Gates:
 1. Shall be four (4'-0") feet wide, unless otherwise noted.
 2. Gate frame shall be constructed of 1⅝" O.D. Schedule 40, weighing 2.27 lbs/lin.ft.
 3. Fabric to be same as fencing.
- B. Miscellaneous fittings shall be furnished as needed and shall be galvanized at no cost to the Owner.

2.03 CONSTRUCTION FENCING

- A. In all cases, a construction fence shall be specified to enclose the work area, storage areas, Contractor and his employee parking. Minimum hog wire with drive-in posts acceptable.
- B. This section provides minimum guide specifications for the installation of a temporary six (6'-0") foot site construction fence as specified below. The Contractor has the option to install a fence that provides greater security for the construction site.
 1. "Field Fence" of 12.5 gauge wire, 6 inch spacing between stays (vertical wires), minimum of 47 inches in height and Type 1 galvanized coating.

2. Studded "T" posts of high strength steel and a minimum of 6'-0" in height and a maximum spacing of 8'-0" on center.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Brace end, corner and pull posts with horizontal intermediate brace and truss braces.
- B. Install top rail continuous with couplings not less than six (6") long.
- C. Attach barbed wire on supports on exterior side of enclosed space if fence is on property line.
- D. Fabric:
 1. Install fabric on exterior of enclosed space.
 2. Stretch fabric taut, allowing approximately two (2") inches clearance at grade or paving.
 3. Fasten to line posts and to rail with ties; all other areas with stretcher bars.
 4. Tie fabric to post at 1'-0" o.c.; top rail at 2'-0" o.c.
 5. Fabric shall not by pass end, gate, corner or pull posts.
 6. Stretcher bars shall be threaded through fabric and secured to posts by bands or other mechanical devices.
 7. Install continuous tension wire threaded through lower edge of mesh, secured at line posts and anchored at terminal posts.
- E. Install gates complete with specified hardware at locations to suit construction activity and as acceptable by Owner. Adjust and lubricate hardware.
- F. Privacy slat, if indicated on the Drawings, shall be woven into fabric in a diagonal design. Ends shall be even and secured to prevent slippage.

End of Section

SECTION 02 933

TEMPORARY SEEDING

PART 1 - GENERAL

1.01 SCOPE

- A. The work covered by this section consists of the establishment of a temporary vegetative cover on disturbed areas by seeding with appropriate rapidly growing grass seed.
- B. Temporary seeding shall be provided for all exposed soil surfaces that are not to be fine graded for lawns or grassed areas or landscaped within 30 days after fine grading.
- C. By submittal of his bid, the Contractor certifies that all means, methods, labor, equipment and materials to complete the satisfactory construction of the Project is included within the contract sum of his bid.

1.02 PROJECT CONDITIONS

- A. Protect any and all adjacent public and private property, wetlands, stream buffers, springs etc. from siltation and other damage due to construction activities with silt dams or fences or by other means as indicated on the Drawings.
- B. Temporary seeding shall be applied to any and all disturbed areas left idle for two weeks and shall be applied no later than the 15th calendar day from last land disturbance activity. (ie. clearing, grubbing or grading).

1.03 QUALITY CRITERIA

- A. Installation shall be in strict compliance with the rules and regulations of the local seed laws.
- B. Installation shall comply with all applicable codes, rules, regulations and ordinances related to erosion control and temporary seeding.

PART 2 - PRODUCTS

2.01 TEMPORARY SEED

- A. Select temporary grass seed appropriate to the season and site conditions.
- B. Temporary grass shall be a quick growing species such as millet, rye grass, Italian rye grass or cereal grasses suitable to the area providing a temporary cover which will not later compete with grasses sown for permanent cover.
- C. Seed shall meet the requirements of the rules and regulations of the Georgia Seed Law.

2.02 LIME

- A. Provide agricultural grade ground or pulverized limestone.
- B. Lime shall contain not less than 85% carbonates with 50% passing a 100 mesh sieve.
- C. Lime shall have tested values of 90% minimum germination and 1% maximum weed content.

2.03 FERTILIZER

- A. Provide standard commercial grade fertilizer, either 4-12-12, 6-12-12 or 5-10-15 as required for the prevailing conditions on the Project site.

PART 3 - EXECUTION

3.01 SEED-BED PREPARATION

- A. Where soils are known to be highly acid (pH 5.5 and lower), apply lime at the rate of two (2) tons per acre (1#/10 s.f.).
- B. Apply fertilizer at a rate of 450 lbs./acre (10 #/1,000 s.f.). Lime and fertilizer shall be incorporated into the top two (2") to four (4") inches of the soil by tilling.
- C. Loosen ground surface by discing, raking or harrowing.
- D. If the area has been recently loosened or disturbed, no further roughening shall be required.
- E. Remove all large clods, boulders and debris which will interfere with the work.
- F. Remove all stones two (2") inches and larger in any given dimension.

3.02 SEEDING

- A. Apply seed evenly with a cyclone seeder, drill, cultipacker seeder or hydroseeder.
- B. Small grains shall be planted no more than one (1") inch deep.
- C. Grasses and legumes shall be planted no more than ¼" deep.
- D. Distribution by hand shall not be permitted.

3.03 ROLLING

- A. Roll all seeded areas before applying mulch.
- B. On steep slopes cover seeds by dragging spiked chains or similar methods.

3.04 MULCHING

- A. All seeding in fall for winter cover shall be mulched.
- B. Seedings on slopes 4:1 or greater, on adverse soil conditions and in excessively hot or dry weather shall also be mulched.
- C. Mulch shall be straw or hay spread at the rate of approximately two (2) tons/acre, wood cellulose fiber applied at the rate of approximately 1500 lbs/acre.
- D. Bituminous treated mulch shall be used on all slopes steeper than 2:1.
- E. Seedings made during optimum spring and summer seeding dates, with favorable soil and site conditions shall not require mulch if written permission is received by the Architect.

3.05 WATERING

- A. Provide watering as required to establish and maintain healthy vegetative cover.

3.06 RESEEDING

- A. Reseed and provide straw cover for bare areas one (1) square foot and larger to establish and maintain vegetative cover and to prevent sheet and rill erosion.
- B. Repair erosion damage as required and reseed.

End of Section

SECTION 03 100

CONCRETE FORMWORK

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit manufacturer's specifications and product data of proposed formwork ties.

1.2 QUALITY CRITERIA

- A. The design, engineering, construction, and removal of concrete formwork shall be the Contractor's responsibility. Except as specifically called for otherwise herein, all formwork shall meet "ACI Standard Recommended Practice for Concrete Formwork" (Latest Edition of ACI 347) as a minimum requirement.
- B. Forms shall be constructed and reinforced to ensure that poured concrete is accurately placed to a tolerance of 1/8" in 10'-0". Verify accuracy with a 10'-0" straight edge.

II. PART 2 - PRODUCTS

2.1 FORMS FOR FOOTINGS

- A. Earth may be used as form for footings provided the earth is clean-cut and true with bottom level and sound.

2.2 FORMS FOR EXPOSED SURFACES

A. Acceptable Form Materials

1. Plywood shall be 5/8" thick, mill oil impregnated, edge sealed exterior form type, grade BB-DFPA, concrete commercial standard 45 - 60 not previously used on any other job.
2. No. 1 lumber shall be T & G southern yellow pine S4S lined with minimum 3/16" thick tempered pressed wood or 1/4" plywood conforming to federal specification LL-H-35.
3. Metal forms are acceptable.
4. Forms shall be built of sound lumber and bevel strips for sign shall be placed as shown on contract drawings.

- B. Joints shall be filled with bee's wax, a composition of tallow and cement or taped.

- C. If any forms bulge or show deflection, which in the opinion of the Architect exceeds the prescribed tolerances, the concrete shall be removed and the work rebuilt.

2.3 UNEXPOSED SURFACES

- A. Forms shall be same as for exposed surfaces, except No. 2 common or better lumber shall be acceptable. Joints shall not require treatment.

2.4 TIES

A. Characteristics

1. Ties shall have minimum working strength of 4000 lbs.
2. Ties shall be adjustable in length to permit tightening.
3. Ties shall leave no larger than 7/8" diameter impression on finished surface.
4. Ties shall leave no metal within one inch of finished surface when tie is removed.
5. Wire ties are not permitted.

2.5 JOINTS

- A. Expansion joint filler shall be premolded, 1/2" thick, asphalt impregnated fiber strips. Provide where expansion may cause damage.
- B. Construct expansion joints, control joints, construction joints and other joints as indicated on the working drawings. Acceptable key type steel formers shall include:
 1. Vulcan Joints
 2. Burke keyed Kold Joint Form
 3. Dayton S-Grip-G-20
- C. Control joints shall be tooled or sawed in cured concrete with a power saw. Joints shall be 1/4" wide x 1/4 the slab thickness. Joint filler, where required on the drawings, shall be asphaltic filler compound.
- D. Provide control joints as shown on construction drawings on both faces on all vertical concrete but not greater than 20'-0" o.c. or two times the vertical height unless closer spacing is specified elsewhere. Joints shall be sealed on earth face with asphaltic filler compound and on exposed face with sealant.

III. PART 3 - EXECUTION

3.1 INSTALLATION/ERECTION

- A. The design and engineering of the formwork, as well as its construction shall be the responsibility of the Contractor. Except as

specifically called for otherwise herein, all formwork shall meet the "ACI Standard Recommended Practice for Concrete Formwork" (ACI 347) latest edition.

- B. Construct forms to slopes, lines and dimensions indicated on the drawings, plumb straight and sufficiently tight to prevent leakage. Securely brace and shore forms to prevent displacement. Provide access openings for cleaning and inspection prior to depositing concrete. Do not coat form with material that will stain or cause damage to exposed concrete surfaces or to finish material applied directly to concrete. Forms for beams, girders and lintels shall be constructed so that sides may be removed without disturbing bottom of form or its support. Chamfer external corners of all exposed concrete as noted or directed by Architect.
- C. Provide for installation of inserts, conduits, pipe sleeves, drains, hangers, metal ties, shelf angle supports, anchors, bolts, angle guards, stair nosing, dowels, thimbles, anchor slots, metal reglets, nailing strips, blocking, grounds and other fastening devices required for attachment of other work. Properly locate forms in cooperation with other trades and secure accurately in position before concrete is poured. Do not install sleeves in concrete beams or columns unless reviewed by the Architect and structural engineer. Allow sufficient time between form erection and placing of concrete for proper installation of work by various trades. Coat embedded conduits for corrosion protection as required by Code. Provide 1 1/4" or one conduit diameter minimum spacing between conduits, whichever is larger.
- D. The inside surface of wood board forms shall be soaked with clean water prior to placing concrete. Plywood or pressed wood forms, except as otherwise specified herein, shall be treated with an approved form oil or lacquer. Wipe off excess oil with rags leaving surface of forms just oily to touch. Do not oil forms where finish material is to be applied directly to concrete.
- E. Remove forms in accordance with requirements outlined in ACI 318 in a manner to ensure complete safety of the structure. Remove forms only after concrete has hardened sufficiently to avoid injury to surfaces. Minimum curing time prior to form removal shall be 24 hours. After removal of forms, notify the Architect for review of newly stripped surfaces. Do not patch or touch up newly stripped surfaces until after review by the Architect.

End of Section

SECTION 03 200

CONCRETE REINFORCEMENT

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit shop drawings indicating bending diagrams, assembly diagrams, splicing and lap of bars, shapes, dimensions and details of bar reinforcing and accessories for all steel reinforcing. Shop drawings submitted after material is installed shall not be reviewed by Engineer. The Contractor is urged to organize these shop drawing submittals accordingly to allow adequate time for review and processing. Covering of steel for which shop drawings have not been reviewed is prohibited. Contractor shall assume total responsibility for steel reinforcing covered with concrete or grout for which shop drawings have not been reviewed. These instructions shall be strictly enforced.
- B. A submittal package for fibers must be incorporated with concrete mix designs for approval by engineer, before any concrete can be placed. The following data must be in submittal package, independent laboratory test reports to ascertain the fibers meet or exceed specifications:
 - 1. Meets ASTM C-1116 Type III, 4.1.3, Standard Specification For Fiber-Reinforced Concrete and Shotcrete.
 - 2. Meets ASTM C-1399 Test Method for Determining Average Residual Strength of Fiber Reinforced Concrete, >45 psi. Using 4 beams from a single batch.
 - 3. Certification that fiber meets all requirements stated in Section 2.2 of this document.

1.2 DELIVERY AND STORAGE

- A. Concrete reinforcing materials delivered to the project shall be stored above ground under waterproof cover.

II. PART 2 - PRODUCTS

2.1 BARS

- A. Steel reinforcement shall be manufactured from new billet steel of domestic manufacture conforming to ASTM A 615, Grade 60, except for where a detail requires welding, rebar shall conform to ASTM A 706.

- B. Deformed reinforcing bars for applications where welding is indicated on the Construction Documents shall meet the requirements of ASTM A706 and be marked with the letter W.

2.2 COLLATED FIBRILLATED POLYPROPYLENE (CFP) FIBROUS BUNDLES

- A. CFP shall be used as secondary reinforcement in concrete slabs-on-grade.
- B. Synthetic fibrous reinforcing material shall be 100 percent virgin polypropylene fibrillated fibers containing no reprocessed olefin materials and specifically manufactured to use as concrete secondary reinforcement. Fibers shall have a specific gravity of 0.91, graded per manufacturer, have UL or Omega Point classified fire ratings, and complies with local and national building code. Fibers shall be manufactured in an ISO 9002 certified facility for use as concrete secondary reinforcement at a minimum of 1.5 pounds per cubic yard.
- C. The fibers shall conform to ASTM C1116 and have a Residual Strength of no less than 45 psi, using 4 beams from a single batch conforming to ASTM C1399 test method for Determining Average Residual Strength of Fiber Reinforced Concrete.
- D. Comply with the specified requirements of CSI specification #39 relating to CFP reinforcement. Fibrous bundle lengths shall be based on the top size of the coarse aggregate in the concrete mix as follows:

Coarse Aggregate Top Size	AASHTO Size Designation (ASTM C33)	Fibrous Bundle Length	Forta CR Designations
1/4"	#10	3/4"	#A5
1/2"	#8	1-1/2"	#A10
3/4"	#67	2-1/4"	#D15
1"+	#57	2-1/2"	#D24

- E. Acceptable products shall include "Forta Econo-Net" as manufactured by the Forta Corporation, "Procon F" by Nycon, Inc., "Fibermesh 300" by SI Concrete Systems. Similar products of other manufacturers shall be subject to architect's review.

2.3 ACCESSORIES

- A. Spacers, chairs, bolsters, ties, etc. shall conform to ACI 315. Use plastic coated supports where rust may stain concrete or other finished surfaces and where supports contact earth.

2.4 FABRICATION

- A. Steel bars shall be fabricated as indicated and in accordance with ACI 315.

III. PART 3 - EXECUTION

3.1 QUALITY CONTROL

- A. Cleaning, bending, placing and splicing reinforcement shall be in accordance with ACI 315 and ACI 318.
- B. All slabs on earth shall be reinforced with CFP.
- C. Reinforcement shall be tied in splices and intersections and shall be securely held in position with spacers, chairs or other acceptable supports at 5'-0" on center maximum.
- D. Reinforcement shall be free of loose or flakey rust, scale, dirt and ice at the time of concrete placement.

3.2 INSTALLATION REQUIREMENTS

- A. Steel reinforcement shall be protected by concrete cover. Where not otherwise shown on the drawings, the thickness of concrete over the reinforcement shall be as follows:
 - 1. Concrete cast against earth - 3"
 - 2. Formed concrete exposed to earth or weather - 2"
 - 3. Walls - 1"
 - 4. Slabs (Exposed to Weather) - 1-1/2"
- B. Provide adequate notice to Engineer or his designated representative to provide sufficient opportunity for review of the placement of reinforcing steel before concrete is placed. All reinforced concrete pours shall be so reviewed.

3.3 CFP INTRODUCTION TO CONCRETE

- A. Fibers shall be added at the concrete batch plant at the rate of 1.5 #/CY of concrete. Fiber supplier shall provide a representative to instruct the concrete supplier in proper batching and mixing of material for initial placement if requested.
- B. Slump tests shall be performed prior to the inclusion of CFP into the concrete.
- C. If a high range (superplasticizer) water reducing agent is used, CFP shall be added and distributed prior to its incorporation.

- D. CFP reinforced test specimens shall be vibrated externally in accordance with the requirements of ACI 544.
- E. Tined rakes shall not be used as a means to convey CFP reinforced concrete.
- F. To improve the movement of CFP reinforced concrete through concrete pumping equipment, the chute at the concrete truck shall be elevated 14" above the grate.

End of Section

SECTION 03 300

CAST-IN PLACE CONCRETE

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit concrete mix designs to Architect for all classes of concrete at least 15 days prior to start of concrete work required on this project. Mix designs shall identify proportions of all materials to be used, including admixtures. Submit test data to verify strengths.
- B. Submit delivery tickets for each load of ready-mixed concrete delivered showing the class and strength of concrete, pounds of cement per cubic yard, maximum size of coarse aggregate, the slump ordered, amount of admixtures and time of batching.

1.2 QUALITY CRITERIA

- A. Concrete shall comply with ACI 318 and ACI 301. Adhere to all jurisdictional code requirements for reinforced concrete.
- B. Ready mixed concrete shall comply with ASTM C94.
- C. All work shall comply with International Building Code 2006 Edition, with 2007 and 2009 Georgia Amendments.

1.3 TESTING

- A. Concrete testing shall be performed by a certified testing agency selected and paid for by the Owner. The Contractor will be responsible for notifying the testing agency 24 hours prior to placing concrete. Testing agency shall copy Architect, Owner and Contractor in all test reports and notify Architect by phone or fax if test reports indicate abnormalities.
- B. Provide a secure area for the performing of concrete tests and forming and storage of test specimens. Samples shall be procured by the testing agency in accordance with ASTM C172 and cylinders shall be made and cured in accordance with ASTM C31.
- C. The following tests are required as a minimum:
 - 1. Slump tests (1 test per each 20 cubic yards) in accordance with ASTM C142.
 - 2. Compressive tests (4 cylinders for each test) in accordance with ASTM C39. One cylinder shall be broken at 7 days and two at 28

- days. The average of the 28 day breaks shall be considered one test. One cylinder shall be held and broken at 56 days only if test fails to meet specification.
3. Air entrainment for applicable classes of concrete in accordance with ASTM C231.
 4. Moisture tests on cured concrete prior to installation of finish flooring material. Concrete floors are to be adequately cured and dry, maximum moisture emission shall not exceed 3 pounds per 1000 square feet in 24 hours when done in accordance with the Rubber Flooring Manufacturer's Association Calcium Chloride Dome Test.
 5. Relative humidity shall be tested in accordance with ASTM F2170. The probe hole depth shall be 40% of slab thickness. Allow 72 hours after drilling probe hole prior to measuring relative humidity.
- D. Frequency
1. Procure one set of compressive test specimens for each 100 cubic yards (or fraction thereof) for each class of concrete placed each day.
 2. Perform air entrainment tests for each set of cylinders of air entrained concrete.
 3. Perform unit weight tests in accordance with ASTM 567.
- E. All concrete test reports shall include slump test, specific statement of where concrete is located in the structure, statement of number of yards of concrete emptied at test, total number yards of concrete in truck, air temperature, time.
- F. All reviewed submittals shall be distributed to the following:
1. Project Manager/General Contractor
 2. Project Manager/Architect
 3. Project Manager/Owner
 4. General Contractor's Job Office
 5. Structural Engineer

1.4 PROCEDURES

- A. The results of the concrete tests shall be evaluated in accordance with Paragraphs 17.2 of ACI Standard 301.
- B. If the evaluation of the compressive test indicates that the concrete has failed to meet the specified strength, core tests shall be made in the in-place concrete. The location and number of such tests to be determined by a laboratory approved by the Architect. Tests shall be paid for by the Contractor.

- C. If the core tests fail to verify the strength specified, the Architect shall effect one of the following procedures:
 - 1. Have the Contractor remove and reconstruct that portion of the structure found to be defective.
 - 2. Accept the concrete in place and issue a change order as set forth in the General Conditions of these Specifications for a credit value to be agreed upon by the Owner, the General Contractor and the Architect.
- D. Concrete testing shall be backcharged to the Contractor if specified strength is not obtained.

II. PART 2 - PRODUCTS

2.1 ADMIXTURES

- A. Use no additives to prevent freezing. Exposed concrete shall be air entrained between 4.5% and 6% by volume. Admixtures for water reducing and enhancing handling and finishing shall be submitted for review before installation.
- B. No flyash shall be substituted for cement content.

2.2 WATER

- A. All water used in concrete shall be clean and potable.

2.3 READY-MIXED CONCRETE

- A. Concrete mix shall be designed to achieve minimum 28 day strengths of:
 - 1. 3000 psi for sills, steps on grade and sidewalks
 - 2. 3500 psi for slabs on grade and exterior slabs on grade
 - 3. 3000 psi for all foundation concrete.
 - 4. 2000 psi grout for filled masonry cells
 - 5. See retaining wall drawings for design mix at walls.
- B. Slump for all grout shall be between 9 and 11 inches.
- C. Maximum unit weight of lightweight concrete shall not exceed 120 PCF.

2.4 CURING COMPOUNDS

- A. Interior concrete slabs which will serve as a substrate for any finish floor materials, including all hard tile shall be cured with curing compound by one of the following manufactures:
 - 1. "1100 Clear" as manufactured by W. R. Meadows
 - 2. "Resin Cure E" by Nox-Crete Products
 - 3. "Aqua-Kure" by Lambert Corporation

NOTE: Interior curing compounds should be dissipated or removed prior to installation of moisture sensitive finish floor materials.

(Alternate Curing Procedure: Cover slab with waterproof paper, plastic sheets or a combination of the two for not less than three (3) days and not more than seven (7) days. Allow slab to dry for an amount of time per floor covering manufacturers recommendation but not less than 45 days under roof. Refer to ACI 302.2R-06 "Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials".)

- B. Exterior concrete walls shall be cured with one of the manufacturers listed below. Those exterior concrete surfaces which are proposed to receive a finish, such as paint, stucco, stain, etc., shall be acid etched in accordance with the curing compound manufacturer's recommendations no later than 24 hours prior to the finish material application.
 - 1. "CS-309-25" as manufactured by W. R. Meadows.
 - 2. "Enviroseal 20" as manufactured by Hydrozo, Inc.
 - 3. "Kure & Seal 1315" as manufactured by TK Products.

2.5 CONCRETE FLOOR SEALER

- A. See Painting Specification Section 09 900 for concrete floor sealer.

2.6 NON-SHRINK GROUT

- A. Non-shrink grout shall be one of the following products:
 - 1. Castle Chemical Company: "Imperial"
 - 2. Gifford-Hill and Company: "Supreme"
 - 3. Master Builders Company: "Master Flow 713"
 - 4. Sonneborn-Contech, Inc.: "SonogROUT"
 - 5. Minwax Construction Products: "Halco"
 - 6. W.R. Meadows: "Sealtight 588"

III. PART 3 - EXECUTION

3.1 NOTIFICATION

- A. Notify the Architect as far in advance as possible of each placement of concrete to permit review prior to installation.

3.2 PREPARATION

- A. Ensure that concrete formwork and reinforcing are prepared in accordance with the drawings and/or related specifications at the time of concrete placement.
- B. Earth forms for concrete shall be prepared as indicated on the drawings and/or related specification sections. Ensure that bearing surfaces are clean, well-graded soil material free of debris and organic material and compacted to prescribed bearing capacity.

- C. Earth forms shall be damp, free of surface water, mud, frozen material, loose soil and debris.

3.3 MIXING

- A. All materials shall be measured and mixed in a machine. Mixing and transporting shall meet ASTM C94. The materials shall first be mixed dry and the water then added by measurement.
- B. Mixing time shall begin when the water is added to the mix.
- C. Water shall not be added to the mix at the job site except under the direction of the laboratory that designed the mix. The laboratory shall instruct that a fixed amount of cement shall be added to maintain the water/cement ratio. The mixer shall be turned 50 revolutions after the addition of water.
- D. A slump test shall be made of any concrete to which water has been added to ascertain that the slump does not exceed 5" for regular mixes and 6" for pump mixes.
- E. A record shall be kept of any concrete to which water has been added and the record shall show the results of the slump test.

3.4 PLACING

- A. Transport and place concrete in a manner to avoid segregation and in accordance with ACI 318 and ACI 304.
- B. Concrete having attained initial set or having contained water more than one hour before final placement shall not be used.
- C. Concrete shall not be dropped more than three feet. Greater drops shall be handled with chutes.
- D. Consolidate concrete by spading, vibrating, rodding and tamping. Work concrete around reinforcing, inserts and into corners. Avoid objectionable segregation. Ensure concrete fills all voids in form work and fully contacts all surfaces. Take measures to prevent honeycombing. Excessive honeycombing shall be grounds for rejecting concrete work. Form slabs level unless otherwise indicated, to within 1/2" in 10'-0". Verify with a metal straight edge.
- E. Construction joints shall be located only as reviewed by the Architect, Structural Engineer and as shown on the drawings. All construction joints shall be filled with asphaltic filler after concrete is sufficiently cured, unless such joints are specified to be treated otherwise.
- F. Control joints on all concrete surfaces shall be located as indicated on the drawings. Construction methods proposed for use other than those

specified in section 03 100, part 2.5 or indicated on the working drawings shall be subject to review by the structural engineer.

G. Cold Weather

1. When temperatures are 40°F and falling, water or aggregates, or both, shall be heated sufficiently to insure that the temperature of the concrete at the time of delivery shall be 55°F or above.
2. The placing, curing and protection of the cast in place concrete shall comply with the provisions of ACI 306R.

H. Hot Weather

1. During hot weather conditions excessive concrete temperatures and water evaporation which could impair the strength or serviceability of the structure shall be prevented.
2. Production, delivery, placing, curing and testing of the cast in place concrete shall comply with the provisions of ACI 305R.

3.5 FINISHING

A. Slabs

1. Concrete sub-floors to receive topping, mortar beds for tile, etc. shall be left in rough condition with coarse aggregate slightly exposed.
2. Exposed exterior slabs shall receive a fine broom finish. Surfaces shall be rolled or tamped to force aggregate away from surface, screeded and then finished with wood floats or steel trowels. While concrete is still green, apply uniform light broom finish with stiff-bristled push broom perpendicular to direction of travel and tool control joints approximately ½" deep with radiused edges.
3. Interior slabs shall receive a hard steel trowel finish. Surfaces shall be rolled or tamped to force aggregate away from surface, screeded, and then finished with wood float or steel trowel to achieve required tolerance of leveling or slope if required. Do not overwork. When concrete has so hardened that water and fines do not work into surface, finish with steel trowel or troweling machine to smooth surface, free of blemishes and hard enough to make trowel ring.
4. Concrete in custodial rooms, mechanical/electrical rooms, storage rooms, and any other interior slabs that will not receive topping or finish flooring shall be cleaned for a uniform finish and sealed. Floors shall be protected during construction from staining and damage.

B. Formed Surfaces

1. Patching
 - a. Do not patch or touch-up newly stripped surfaces until after review by the Architect. Concrete which, in the opinion of the Architect, exhibits excessive defects shall be condemned

- and removed from the site at the Contractor's expense and replaced at no additional cost to the owner.
- b. All surfaces shall be patched to fill all the holes and correct minor honeycombing and other defects 1 ½" or less in any dimension the same working day the forms are removed. Concrete with larger defects shall be replaced at no additional cost to the Owner to the extent designated by the Architect.
 - c. Wet the areas to be patched and thoroughly brush into the surface a grout coat of cement and sand following immediately with application of patching mortar. Patching mortar shall be of a consistency similar to concrete mix except coarse aggregate shall be omitted. Compact patching mortar into place and screed off leaving patch slightly higher than surrounding surface. Allow patch to set until after initial shrinkage and then finish to match adjoining surfaces. At the Contractor's option, a bonding agent may be used to bond patching material to concrete if written permission is received by the Contractor from the Structural Engineer prior to its incorporation.
2. Unexposed surfaces shall have rough edges and projections broken off.
 3. All exposed interior and exterior concrete, including curbs, gutters, exterior retaining walls, stairs, ramps, exposed slab edges, etc. shall have a rubbed finish. After forms are removed, smooth out joint work and remove blemishes. Imperfections shall not exceed 1/16" in any dimension. While concrete is still slightly green, remove and repair projections, offsets and blemishes. Wet surface thoroughly and rub with cement or carborundum bricks and water until uniformly smooth.
 4. All interior exposed concrete walls or slab edges shall be painted per Section 09 900.

3.6 PROTECTION AND CURING

- A. Protect and cure concrete as specified in the concrete standard ACI 301.
- B. Apply curing compound in accordance with manufacturer's printed recommendations.
 1. Curing compound shall be applied uniformly in continuous operation by power sprayer or roller according to manufacturer's written instructions. Re-coat areas subject to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 2. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies in writing that curing compound will not interfere with bonding of floor coverings used on this Project.

- C. Curing compounds or cure-and-seal materials should not be used unless use is approved in writing by the adhesive and floor covering manufacturer for this Project.

END OF SECTION

SECTION 03 450

ARCHITECTURAL PRECAST CONCRETE

I. PART 1 - GENERAL

1.1 SCOPE

- A. Work described in this section includes manufacture, transportation and erection of architectural precast concrete units at the window elements at the other locations shown on the drawings.
- B. Cast stone shall be an acceptable product for all items labeled architectural precast concrete on the drawings.

1.2 SUBMITTALS

- A. Submit shop and setting drawing which indicate dimensions, finishes, fabrication details, forming materials, reinforcing and connection details, joints and locations of units. Mark units corresponding to setting drawings.
- B. Submit full sized sample of each type unit with color and finish specified for Architect's review. Samples shall match those on file in Architect's office and shall be the standard for architectural precast concrete work until such time as job mock-ups are completed. Submit description of materials and proportions with samples.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling

- 1. Transport and handle precast concrete panels with equipment to protect units from strain, warping, cracking, chipping and staining.
- 2. Place non-staining resilient spacers of even thickness between panels.
- 3. Support panels during shipment on expanded polystyrene or similar non-staining shock-absorbing material.

B. Storage

- 1. Store panels to protect from strain, warping, cracking, chipping and staining.
- 2. Store panels in same position as transported with non-staining resilient supports located in same positions as when transported.
- 3. Store panels on firm, level and smooth surfaces.
- 4. Store panels so that identification marks are discernible.
- 5. Damaged units shall be rejected and removed from project site.

1.4 QUALITY CRITERIA

- A. Precast concrete manufacturer shall be one normally involved in the production of architectural precast concrete, having the facilities and quality control procedures necessary to meet specified requirements. If required, proposed precast manufacturer shall submit evidence of satisfactory completion of similar work and of adequate financial responsibility. The Architect reserves the right to inspect manufacturer's facilities in determining his qualifications.
- B. Testing
1. Testing as described below shall be performed as a part of the work in this section. Testing may be performed by precast manufacturer, subject to Architect's review of manufacturer's testing facilities.
 2. Submit mix design to Architect for review prior to production of precast units.
 3. During production, make a set of five 6" diameter x 12" long test cylinders for each 15 cubic yards of concrete. Cast and cure cylinders using same methods as proposed for precast units. Perform compression tests on two cylinders at seven days and on two cylinders at 28 days. Hold fifth cylinder in reserve. Panels shall be unacceptable if compressive strength of both 28 day cylinders do not meet required compressive strength. Submit four copies of test data to Architect.
- C. Allowable Casting Tolerances
1. Concave or convex bowing or warping shall not exceed L/360.
 2. Overall dimensions shall not vary no more than + 1/8", - 1/4" in height and +or- 1/8" in width.
 3. Cross-sectional dimensions shall vary no more than - 1/8", + 1/4".
 4. Panels shall be a maximum of 1/4" out of square in two diagonal measurements.
 5. Location of cast-in items shall vary no more than +or- 3/8" from centerline shown on reviewed shop drawings.
 6. Location of reglets shall vary no more than +or- 1/8".
- D. Non-cumulative Erection Tolerances
1. Joint dimension shall be nominally 1/2" and shall vary not more than +or- 1/8".
 2. Panel edges at joint shall not be out of parallel over 1/40" per 1' and not more than 3/8" total.
 3. Alignment of panel edges shall not exceed 1/4".
 4. Panel face offset
 - a. Faces of adjacent panels shall not offset over 1/8".
 - b. Bowed panels, within allowable bowing tolerances shall be arranged so offset between adjacent panels does not exceed 1/4".

II. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland cement shall comply with ASTM C150, type 1, pure white color. Only one brand may be used for all precast work.
- B. Aggregate Types
 - 1. Fine aggregate shall be polar sand.
 - 2. Coarse aggregate shall be No. 1 and No. 2 polar quartz.
- C. Acceptable Manufacturers
 - 1. Continental Cast Stone
 - 2. Old World Cast Stone, Lilburn, GA
 - 3. Architectural Ornamental Castings, Inc., Decatur, GA
 - 4. Rockcast
 - 5. Custom Cast Stone
 - 6. Chattanooga Precast Corporation
 - 7. Corbelstone
 - 8. Atlanta West Cast Stone
- D. Color shall be selected by Architect. Submit sample for Architect's approval.
- E. Water shall be clean, potable, free of deleterious amounts of acids, alkalies and organic matter.
- F. Air-entraining admixtures shall comply with ASTM C260. Air entrainment shall be 5% (+ 1%).
- G. Water reducing admixture shall comply with ASTM C494, Type A.
- H. Reinforcing
 - 1. Bars shall comply with ASTM A615, grade 40 or 60 as indicated on drawings.
 - 2. Mesh shall comply with ASTM A185, electro-galvanized.
- I. Anchors and inserts shall comply with ASTM A36 or malleable iron. Bolts shall meet ASTM A307, galvanized per ASTM A386 and prime painted.
- J. Form liners shall be as required to achieve surface textures indicated.

- K. Acceptable Concrete Sealer products
 - 1. Gifford-Hill & Co.: Sealco.
 - 2. National Construction Products: Klearseal.
 - 3. Process Solvent Co.: Weatherseal.
 - 4. W. R. Grace & Co.: Horntraz.
- L. Mix retarder shall be Preco Retarder.

2.2 CHARACTERISTICS

- A. Architectural precast concrete shall comply with the following criteria:
 - 1. Minimum compressive strength shall be 5000 p.s.i. at 28 days.
 - 2. Water absorption shall comply with ASTM C97, 6% maximum at 29 days.
 - 3. Dry tamp is allowed.
- B. Finishes shall be as-cast, matching samples in the Architect's office achieved by the use of form liners.
- C. Mix design shall be as required to accommodate color as specified by Owner.
- D. Precast units shall be entire width of window.

2.3 JOB MOCK-UPS

- A. Construct a sample indicating finish required for pre-cast concrete. Sealed as specified.

2.4 FABRICATION

- A. Design of precast concrete units, including reinforcement and placement of anchors and accessories shall be performed by a structural engineer employed by the manufacturer.
- B. Fabricate precast units to sizes and profiles indicated. Provide anchors and similar cast-in-place items at locations indicated on reviewed shop drawings.
- C. Form, place and consolidate concrete in accordance with manufacturer's standard practices to achieve required results.
- D. Form cure units until sufficient strength has developed to permit handling units without damage. Moist cure exposed concrete surfaces.

- E. Patch defects in exposed precast faces to match surrounding concrete. Discard panels if patching does not produce uniform color and texture.
- F. Identify each panel with markings as indicated on setting drawings.

III. PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine surfaces designated to receive work described in this section for conditions adversely affecting the finished work. Repair or replace surfaces not meeting tolerances or quality requirements imposed within specifications governing substrate construction prior to initiating this work.

3.2 ERECTION

- A. Set precast concrete panels plumb, level and true to line within specified erection tolerances. Dimensional tolerances shall be non-cumulative.
- B. Secure precast panels in place by bolting or welding, or both, as indicated on reviewed shop drawings. Provide temporary anchoring as required.
- C. Set units, dry, without mortar, attaining specified joint dimension with lead, plastic, asbestos-cement or steel spacers.
- D. Clean field welds with wire brush and protect materials with same material used for shop coat.

3.3 CLEANING, SEALING, AND PROTECTION

- A. Finished surfaces shall be cleaned by precast manufacturer prior to shipment. Cover panels during shipment and storage to prevent staining of surfaces.
- B. Upon installation, remove stains resulting from erection using a neutral cleaner acceptable to cement manufacturer. Flush surfaces with clear water and allow to dry prior to sealer application.
- C. Apply first coat of sealer to precast concrete as soon as practical following erection. Apply sealer in accordance with manufacturer's printed instructions.
- D. Following sealer application, cover precast surfaces subject to staining with polyethylene sheets. Maintain covering until time for application of second coat.

- E. Upon completion of project and immediately prior to Date of Substantial Completion, reclean surfaces as necessary and apply second coat of sealer.
- F. Materials and equipment used in the initial and final cleaning operations, as well as the manner in which they are performed, shall be as recommended by the manufacturer of the sealer and acceptable to the Architect.

END OF SECTION

SECTION 04 100

MORTAR

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit manufacturer's product specifications and mixing/installation instructions for each specified product.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials, except aggregate, in original unopened containers displaying product name, type grade and mixing instructions.
- B. Store materials to prevent intrusion of foreign materials. Store cement, lime and admixtures above ground level and covered for protection from moisture and contamination.
- C. Broken packages showing water marks or damage shall be rejected.

II. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acceptable manufacturers shall include:
 - 1. Giant Masonry Cement
 - 2. Holcim Mortamix
 - 3. Coosa Masonry Cement by National Cement Co.
 - 4. LaFarge
 - 5. Cemex
- B. Portland cement shall comply with ASTM C150. Portland cement for unexposed masonry shall be a natural color of domestic manufacture. Only one brand per color may be used throughout project.
- C. Masonry cement shall comply with ASTM C91. Cement shall be non-staining and have a 22% maximum air content by volume. Only one brand may be used throughout project, except when pre-mixed colored masonry cement is specified.
- D. Hydrated lime shall comply with ASTM C207. Lime shall be Type S or M.
- E. Mortar for brick masonry shall be Type N colored mortar, to match existing.

- F. Aggregate
1. Aggregate for mortar shall be clean, hard, natural washed sand complying with ASTM C144.
 2. Aggregate for cement grout shall be same quality as above but with sizes less than $\frac{1}{8}$ inch in diameter.
- G. Water reducing and plasticizing admixture shall be one of the following products:
1. Lambert Corporation: "Hydrocel"
 2. Master Builders Company: "Omicron Mortarproofing"
 3. Sonneborn-Contech, Inc.: "Hydrocide"
- H. Non-shrink grout shall be one of the following products:
1. Castle Chemical Company: "Imperial"
 2. Gifford-Hill and Company: "Supreme"
 3. Master Builders Company: "Master Flow 713"
 4. Sonneborn-Contech, Inc.: "SonogROUT"
 5. Minwax Construction Products: "Halco"
 6. W. R. Meadows: "Sealtight 588"
- I. Water for mixing shall be clean, potable and free from deleterious amounts of alkalis, acids and organic materials.
- J. Anchoring cement shall be "Por-rok" as manufactured by the Minwax Construction Products. Equal products by Sonneborn Building Products and Master Builders, Inc. are acceptable.

2.2 PROPORTIONS

- A. Mortar for CMU shall be type "S". Proportion materials by volume in accordance with ASTM C270 and the following instructions:
1. Mix one part masonry cement to $\frac{1}{2}$ part portland cement to aggregate proportioned at not less than $2\frac{1}{4}$ nor more than three times the volumes of cements used or,
 2. Mix one part portland cement and $\frac{1}{4}$ to $\frac{1}{2}$ part hydrated lime to aggregate proportioned at not less than $2\frac{1}{4}$ nor more than three times the combined volume of cement and lime used.
- B. Proportion cement grout materials by volume in accordance with ASTM C476. Mix at one part portland cement and $\frac{1}{10}$ part lime to aggregate proportioned at not less than $2\frac{1}{4}$ nor more than three times the sum of volumes of cementitious materials used.
- C. Mix prepared non-shrink grout product with water as directed by manufacturer's printed literature to achieve a minimum compressive strength of 5000 psi at 7 days.

- D. Pre-mixed and packaged mortar mix may be used in lieu of job mixed mortar provided the proportions are as stipulated above. The mix shall conform to ASTM C270.

III. PART 3 - EXECUTION

3.1 MIXING

- A. Mix mortar and cement grout in power-driven, drum type mixers. Operate mixer a minimum of five minutes after addition of all materials.
- B. Add water reducing and plasticizing admixture to all mortars in accordance with admixture manufacturer's printed instructions. Addition of other admixtures, including anti-freeze ingredients, shall not be permitted without prior review of Architect and Structural Engineer. Admixtures shall not be incorporated until contractor has received written indication from structural engineer that admixture is acceptable for use.
- C. Measure materials in a one-cubic foot container. Do not measure by shovels.

3.2 PLACING MORTAR AND GROUT

- A. Place mortar as directed in Section 04 220 - Concrete Masonry units.
- B. Retemper mortar as necessary to maintain plasticity. Use no mortar after setting has begun or after 2-1/2 hours of initial mixing.
- C. Do not place mortar when air temperature is below 35 degrees F. Provide wind shields for all masonry work for initial 24 hours after mixing and placing mortar. See Part 3.8 of Section 04 220 - Concrete Masonry Units for cold weather masonry construction requirements.

END OF SECTION

SECTION 04 105

MASONRY GROUTS

I. PART 1 - GENERAL

1.1 SCOPE

- A. This section covers the furnishing and placing of grout for masonry construction.

1.2 SUBMITTALS

- A. Submit complete plan of procedure before starting construction when grouting is to be placed in temperatures less than 40 degrees F.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Store cementitious materials in a place and manner to prevent contamination from moisture and other substances.
- B. Deliver and store aggregates in a manner to avoid segregation or contamination from other aggregate size fractions or other materials.

1.4 QUALITY CRITERIA

- A. The masonry contractor selected shall have a minimum of five (5) years experience in quality commercial grade construction and shall have successfully completed comparable work on time and in an acceptable workman-like manner.
- B. Sampling, testing and reporting shall conform to the applicable requirements of ASTM E329 and this section. Testing agency shall be employed by the Owner.
- C. Testing agency paid for by the Owner shall perform full time supervision and inspection for all reinforcement bar placement in CMU and all grout placement, verifying conformance with the drawings and specifications in accordance with Section 1704.5 of the International Building Code, 2006 Edition with 2007 and 2009 Georgia Amendments. See Section 01 400, Paragraph 1.3.E.2.
- D. Testing agency shall perform grout tests on samples taken at the site during construction by the following procedure:
 - 1. Place masonry units with same moisture content as those being placed on nonabsorptive base to form a void for a square prism with a height twice the side and a minimum side of 3 inches.

2. Line the side faces of the prism with permeable paper or other porous separator to allow water passage through liner into masonry units.
 3. Fill prism with a fully representative grout sample in two layers. Each layer shall be puddled with a puddle stick approximately 1 x 2 inches to eliminate air voids.
 4. Level off specimen and maintain in a damp condition.
 5. After 48 hours remove masonry units, ship prisms to laboratory and store in fog room until testing.
 6. Cap and make compressive strength test with prism in vertical position in accordance with applicable provisions of ASTM C 39.
- E. The following standards are declared to be part of this specification section:
1. American Society of Testing and Materials
 - a. C 476 Specification for Mortar and Grout for Reinforced Masonry.
 - b. E 329 Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction.
 - c. C-1019 Test Method of Sampling and Testing Grout.

II. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials used as ingredients in grout shall conform to the requirements specified in ASTM C476.
- B. Admixtures may be used when acceptable to the Architect. Contractor shall obtain written indication from architect that admixture will be acceptable for use prior to incorporating them.
- C. Use potable water for all mixing procedures.
- D. Grout shall have a slump of 9" to 11".

III. PART 3 -EXECUTION

3.1 GENERAL

- A. Set reinforcing steel and anchors in required position and secure against displacement before grouting is started.
- B. Grout
 1. Field Mixed
 - a. Proportion materials by volume in accordance with ASTM 476 using one part portland cement and 1/10 part lime to aggregate proportioned at not less than 2 ¼ or more than

- three times the sum of volumes of cementitious materials used.
- b. Mix grout thoroughly for a minimum of five minutes in a mechanical mixer with sufficient water to bring the mixture to a fluid pouring consistency without segregation of materials.
2. Ready Mix Supplied
 - a. Grout shall have a minimum compressive strength of 2000 psi at 28 days and shall be sampled and tested in accordance with ASTM C-1019 for every 5,000 sq. ft. of wall surface.
 - C. Place grout in cores and bond beams while fluid and before initial set has taken place. Puddle or vibrate grout into place.
 - D. Grout lintel beams over wall openings in one continuous operation.
 - E. Grout vertical cores in 5 feet maximum lifts. Stop grout pours 1 ½ inches below a mortar joint, except at top of wall. Where bond beams are used, stop grout pour ½ inch below top.
 - F. Use metal lath, mortar or special units to confine grout to area required. Do not use materials which may inhibit bond or are combustible.

3.2 LOW-LIFT GROUTING

- A. In hollow concrete masonry unit construction, limit low-lift grouting to maximum wall height of 4'-8" per lift. Vertical cores to be grouted shall have minimum clear dimension between sides of the core of two inches and clear area of eight square inches.

3.3 HIGH-LIFT GROUTING

- A. Grout hollow concrete masonry units in accordance with this section when erected to height in excess of five feet. Vertical cores to be grouted shall have minimum clear dimension of three inches and clear area of 10 square inches.
- B. Provide 12 square inch inspection holes in exterior face of exterior CMU walls at base of each lift opposite vertical rebar to confirm grout is solid for full height of wall. Grout inspection hole shall be grouted flush with face of CMU wall.
- C. Clean cores of mortar droppings and foreign material, position reinforcement and close cleanout openings before grouting.
- D. Place vertical barriers consisting of masonry units and mortar in bond beam type concrete masonry units to be grouted at 30 ft. maximum intervals to limit horizontal flow of grout.

- E. Pour grout in 5 feet maximum lifts, allowing minimum of 30 minutes and maximum of one hour before pouring next lift. Grout shall be consolidated by puddling or vibrating at time of pouring and then reconsolidated before plasticity is lost. Reconsolidation may occur as next lift is poured.
- F. Do not erect masonry to a height of more than 80 times minimum clear grout space before grouting unless otherwise acceptable to the Architect.

3.4 CONSTRUCTION PROTECTION

- A. Do not use high-lift grouting method until concrete masonry units have been in place for three days minimum, unless otherwise permitted by the Architect.
- B. Do not permit water or foreign material to fall in grout space during grouting and curing.

3.5 CLEANUP

- A. Remove misplaced grout immediately and clean affected areas.

END OF SECTION

SECTION 04 150

MASONRY REINFORCEMENT AND ACCESSORIES

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit manufacturer's product data of all accessories and masonry reinforcement products to Architect for review.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in manufacturer's original packaging.
- B. Store materials off ground and under weatherproof cover. Install no materials which are damaged or corroded.

1.3 QUALITY CRITERIA

- A. Testing agency paid for by the Owner shall perform full time supervision and inspection for all reinforcement bar placement in CMU and all grout placement, verifying conformance with the drawings and specifications in accordance with Section 1704.5 of the 2006 IBC with 2007 and 2009 Georgia Amendments. See Specification Section 01 400.

II. PART 2 - PRODUCTS

2.1 MASONRY JOINT REINFORCEMENTS

- A. Acceptable manufacturers of masonry joint reinforcement products shall include the following:

1. AA Wire Products Company
2. Dur-O-Wal, Inc.
3. Heckmann Building Products, Inc.
4. Hohmann and Barnard, Inc.
5. Wire-Bond
6. Ty-wall by Jim Taylor, Inc. (must be used where air space exceeds ½")
7. Sandell Construction Solutions

- B. Masonry joint reinforcement in exterior walls exposed to weather shall be hot dipped, galvanized trussed steel wire. Other reinforcement shall be mill galvanized. All joint reinforcement shall comply with the following requirements:

1. Fabricate reinforcement from cold-drawn wire complying with ASTM A82.

2. Longitudinal rods shall be 9 gauge deformed wires with 9 gauge galvanized cross wires welded to form a triangular pattern.
3. Width of reinforcement shall be 2" less than width of masonry wall.
4. Provide reinforcement in 10'-0" lengths with prefabricated corners and tees.

2.2 VENEER TIES

- A. Masonry veneer shall be attached to the structural elements or the back-up construction by means of rectangular adjustable wall ties with hook and eye system to allow for vertical movement. Acceptable manufacturers shall include the following:
 1. AA Wire Products Company
 2. Dur-O-Wal, Inc.
 3. Heckmann Building Products, Inc.
 4. Hohmann and Barnard, Inc.
 5. Wire-Bond
 6. National Wire Products Industries, Inc.
- B. Typical ties shall be 3" x 3/16" diameter hot-dip galvanized triangle ties.

2.3 COLUMN TIES

- A. Typical ties shall be triangular steel wire meeting ASTM A82, 3/16" x masonry width less 5/8" with weld-on or screw-on type ties to column, minimum 9" long.
- B. Ties at expansion joints shall match typical ties except they shall have a 1/8" wide x 1-3/4" deep vee section for expansion.

2.4 TELESCOPING REBAR POSITIONER

- A. Provide telescoping rebar positioner to position rebar in concrete masonry units where space requirements are inadequate. Acceptable product is No. 374 Steel-Wich Rebar Positioner.

III. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install reinforcement and accessories in accordance with manufacturer's printed instructions.
- B. Install masonry joint reinforcement in masonry walls at 16" on center vertically. Lap side rods 6" minimum at splices. Stop reinforcement one inch back from expansion joints and openings in masonry walls. Install reinforcement in first and second bed joint and over and under

openings, with non-continuous reinforcement extending 2'-0" beyond jamb on each side.

- C. When masonry is installed, reinforcement and accessories shall be clean and free of anything that will inhibit bond.
- D. Install veneer ties at 16" o.c. vertically and 24" o.c. horizontally.
- E. Column ties shall be welded or shot attached to steel columns @ 2'-0" o.c. vertical, unless noted otherwise on Drawings..

END OF SECTION

SECTION 04 210

BRICK MASONRY

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit five actual brick indicating range of color, texture and size to be expected in finished work.
- B. Prior to delivery of brick, submit brick manufacturer's installation recommendations regarding wetting of brick to ensure proper bond with mortar.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Store and handle brick to prevent chipping of faces and edges.
- B. Stack brick above ground and cover with waterproof cover to protect from inclement weather and staining from mud or construction materials.

1.3 PROJECT CONDITIONS

A. Environmental Requirements

- 1. Lay no masonry when temperature of surrounding air has dropped below 45 degrees F, unless it is rising, and at no time when it has dropped below 40 degrees F, except with written permission from Architect.
- 2. When masonry work is authorized during temperature below 40 degrees F, but above freezing, mortar shall be provided at temperature between 70 degrees F and 100 degrees F.
- 3. Maintain air temperature above 40 degrees F on both sides of masonry for at least 72 hours after laying.

B. Protection of Work

- 1. During erection, keep walls dry by covering at end of each day or shutdown period with a waterproof membrane, anchored and overhanging each side of wall at least 2'-0". During all phases of brick masonry construction, the Contractor shall be required to protect open wall cavities from moisture. It shall be the Contractor's full responsibility to ensure that all areas, such as unfinished veneer walls, uncapped parapets, etc. are covered and protected by some effective means at all times, whether to simply stop work for the day or discontinue work for an extended period of time.
- 2. Remove misplaced mortar and grout immediately.

3. Protect finish materials from staining.
 4. Protect sills, ledges and offsets from mortar droppings during construction.
- C. Do not enclose or cover mechanical or electrical work requiring inspection until such work has been reviewed. Coordinate brick masonry work with work of other trades required to be built into masonry construction.

1.4 QUALITY CRITERIA

- A. Maximum variations from plumb shall comply with the following requirements:
1. Maximum variation in lines and surfaces of walls and arises shall be:
 - a. $\frac{1}{4}$ " in 10'-0"
 - b. $\frac{3}{8}$ " in any story or 20'-0" maximum
 - c. $\frac{1}{2}$ " in 40'-0" or more.
 2. Maximum variation for external corners, expansion joints and other conspicuous lines shall be:
 - a. $\frac{1}{4}$ " in any story or 20'-0" maximum
 - b. $\frac{1}{2}$ " in 40'-0" or more.
- B. Maximum variation from level for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines shall be:
1. $\frac{1}{4}$ " in any bay or 20'-0"
 2. $\frac{1}{2}$ " in 40'-0" or more
- C. Maximum variation of linear building line from established position in plan and related portions of columns, walls and partitions shall be:
1. $\frac{1}{2}$ " in any bay or 20'-0"
 2. $\frac{3}{4}$ " in 40'-0" or more
- D. Maximum variation in cross-sectional dimensions of columns and thickness of walls shall be not less than $\frac{1}{4}$ " smaller nor more than $\frac{1}{2}$ " larger than indicated on drawings.

1.5 SAMPLE WALL PANEL

- A. Lay a 6'-0" long by 4'-0" high sample wall panel of brick veneer and mortar (as specified in Section 01 400). Locate panel as directed by Architect. Panel may be a portion of the permanent construction.
- B. Indicate the following:
1. Bonding
 2. Mortar color (if required)
 3. Joint tooling
 4. Attachment to substrate

- 5. Cavity Insulation
 - 6. Reinforcing
 - 7. Brick color and texture
 - 8. Workmanship
 - 9. Outside Corner
 - 10. Dampproofing
 - 11. Weep Wicks
 - 12. Rowlock, soldier coursing (if applicable), window head, window jamb
- C. Prepare panel at least 14 days prior to beginning brick masonry work. Should panel be rejected, prepare additional panels until accepted by Architect. Do not proceed with brick masonry work until receiving acceptance of sample panel.
 - D. Maintain panel throughout project construction as standard of brick masonry work. Do not destroy panel until direct by Architect.
 - E. Panel shall be erected on substrate adjacent to EIFS and storefront sample panel.

II. PART 2 - PRODUCTS

2.1 BRICK VENEER

- A. Brick Veneer includes brick beginning 2 courses below grade.
- B. Brick Veneer shall comply with ASTM C216, grade SW, Type FBS, ASTM C-652.
- C. Acceptable brick colors and manufacturers shall be a follows:

MANUFACTURER	INFILL UNDER NEW WINDOWS	PATCH AT EXISTING BRICK
Boral Brick	.75 Greystone	MATCH EXISTING ADJACENT BRICK
Hanson Brick	Light Gray Wirecut #761	
Palmetto Brick	.75 Greystone Wirecut	
Cherokee Brick	Velour Light Gray #51-10-201	
Taylor Clay Products	Taylor 320 Gray Wirecut	
Cunningham Brick	Gray Stone	
Carolina Ceramics Brick Co.	Shadow Gray Velour	

- D. All samples must be submitted for review.
- E. All brick veneer shall have through-body color, wirecut, modular size.

2.2 UNEXPOSED BRICK

- A. Unexposed brick shall comply with ASTM C62, grade SW.
- B. Unexposed brick shall course with exposed brick as required.

2.3 WEEP WICKS

- A. Weep wicks shall be $\frac{3}{8}$ " diameter inorganic fiber rope.

2.4 ADDITIONAL BRICK MASONRY PRODUCTS

- A. See Section 04 150 for Masonry Reinforcement and Accessories.

2.5 MASONRY CLEANING COMPOUND

- A. Acceptable Products:
 - 1. Hallmark Chemical Corporation, DC-6.
 - 2. National Chemsearch Corporation, Deox.
 - 3. Prosoco, Inc., Sure-Kleen 600.
- B. Type: Inorganic Acid.

III. PART 3 - EXECUTION

3.1 INSTALLATION

A. Preparation

1. Wet brick according to manufacturer's submitted instructions.
2. Prior to beginning work, clean dirt and debris from surfaces to be concealed and surfaces to receive mortar.
3. Apply liquid dampproofing to above-grade CMU surfaces prior to concealing with brick veneer in accordance with Section 07 150.

B. Installation

1. Install no cracked, broken or chipped units exceeding ASTM allowances.
2. Use abrasive power saw to cut brick. Avoid slivers less than 2" wide.
3. Prior to installation of brick masonry, apply indelible, plumb, vertical control lines upon sheathing substrate, and/or cavity insulation, and/or back-up masonry at spacing not to exceed 48 inches on center continuous for the full height of the brickwork for the purpose of maintaining plumb head joint alignment in alternate courses as required for the specified brick bond pattern.

4. Provide adequate proper ground cover for a minimum width of two feet (perhaps greater as necessary in the Architect's opinion) on the ground around the base of all brick masonry to prevent discoloration of the in-place brick from mud stains or other construction activities. Maintain ground cover until permanent grassing and/or hardscape around brickwork is established.
5. When work is to be stopped and resumed, rack back $\frac{1}{2}$ unit length in each course; toothing is strictly prohibited. Clean exposed surfaces of set masonry. Remove loose masonry and/or mortar prior to laying fresh masonry.
6. Lay brick plumb, true to line and with level courses and spaced within allowable tolerances.
7. Do not furrow bed joints.
8. Stop horizontal run by racking back in each course. Toothing shall not be permitted.
9. Adjust bricks to final position while mortar is still plastic.
10. If bricks are displaced after mortar has set, remove brick, clean joints and units of mortar and relay with fresh mortar.
11. Cutting and patching of brick to accommodate work of other trades shall be done so as not to mar appearance of finished surface.
12. Adjust steel lintels to keep work level and at proper elevation.
13. Provide pressure relieving joints by placing continuous $\frac{1}{8}$ " thick neoprene pad under shelf angle as indicated on drawings.
14. When joining fresh masonry to set or partially set masonry, remove loose brick and mortar and clean and dampen exposed surface of set masonry prior to laying fresh masonry.

C. Mortar Beds

1. Lay brick with full mortar coverage on horizontal and vertical joints in all courses.
2. Provide sufficient mortar on ends of brick to fill head joints.
3. Rock closures into place with head joints thrown against two adjacent bricks in place.
4. Do not pound corners or jambs to fit stretcher units after setting in place.
5. Where adjustment to corners or jambs must be made after mortar has started to set, remove mortar and replace with fresh mortar.

D. Mortar Joints

1. Nominal joint thickness shall be $\frac{3}{8}$ ".
2. Exposed joints, beginning 2 courses below grade, shall be concave tooled joints. Finish joints with a 24" wing tool when mortar set to "thumb-print" hardness.
3. At below grade joints, trowel point or concave tool joints.
4. Strike all other joints flush.

- E. Lay brick in running bond pattern unless otherwise noted on drawings.
- F. Masonry Anchors
 - 1. Install Dovetail anchor slots at 16" o.c. vertically in cast-in-place concrete surfaces. Place anchors concurrently with insulation at 16" o.c. vertically.
 - 2. Attach veneer ties to studs and CMU with mechanical wire fasteners at a 16" o.c. vertically and 24" o.c. horizontally.
 - 3. Provide anchors at 8" o.c. horizontally and vertically at soldier courses.
- G. Flashing
 - 1. Clean surface of masonry smooth and free from projections which might puncture flashing material.
 - 2. Place through-wall flashing on bed of mortar and cover with mortar.
- H. Weep Wicks
 - 1. Provide weep wicks in exterior wythe of masonry at 24" o.c. horizontally at heads and sills of openings, in exterior walls at grade and in other locations where flashing is indicated.
 - 2. Form weeps by placing 12" lengths of rope in mortar joints, extending into cavity. Leave weep wicks in place and cut off flush with exterior face of wall.
 - 3. Keep weep wicks and areas above flashing free of mortar droppings.
 - 4. Install 4" of pea stone in cavity at weep wicks to keep void free of mortar.
- I. Provide $\frac{3}{8}$ " wide control joints in locations shown on drawings. Keep joints clean of mortar and debris. Caulk with sealant in accordance with Section 07 900 - Joint Sealants.
- J. Retain $\frac{1}{2}$ " deep by $\frac{1}{4}$ " wide sealant joint around outside perimeter of exterior doors, window frames and other wall openings.
- K. Cut out defective mortar joints and holes in exposed work. Replace with new mortar to match existing.
- L. Brush brick surfaces with stiff bristle brush and clean water to remove mortar droppings. Do not allow mortar droppings to harden on exposed surfaces. Wet clean brick as laid.

3.2 FINAL CLEANING

- A. At least 21 days prior to application of cleaning solution to brickwork, apply solution to half the surface of sample panel. Should

discoloration of brick or mortar joints, staining or efflorescence appear on sample panel, notify Architect and await further instructions.

- B. No wet cleaning with compounds shall take place within seven days of placing masonry.
- C. At least two hours prior to application of cleaning solution to brick work, saturate mortar joints with clean water and flush off loose debris.
- D. Begin cleaning process at highest point of wall, working downward. Work in areas of 10-20 sq. ft. Flush wall as cleaning progresses to prevent accumulation of scum.
- E. Discard solutions containing debris and residue in a manner not to contaminate adjacent areas.
- F. Do not scrub mortar joints with cleaning solution.
- G. Protect materials adjacent to brick work subject to corrosion from contact with acid solution. Replace any damaged units.
- H. Apply manufactured cleaning compound to brick masonry as tested on job mock-up in accordance with manufacturer's printed instructions. Flush with clean water.
- I. Remove paint stains, welding stains and stains caused by related work in accordance with recommendations of the Structural Clay Products Institute, Technical Notes #20, dated May, 1974. Apply cleaning agents only after testing on job mock-up panel.

END OF SECTION

SECTION 04 220

CONCRETE MASONRY UNITS

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit certificates from the manufacturer in triplicate prior to delivery of concrete masonry units to project site. Each certificate shall be signed by an authorized officer of the manufacturing company and shall contain the name and address of the Contractor, the project location, and the quantities and date(s) of shipment or delivery to which the certificate applies. Units shall be certified for compliance with specified requirements. Information shall contain certified equivalent thickness of all concrete masonry units.
- B. Submit reinforcing steel shop drawings which include all details for fabrication and erection of reinforcing steel. See Section 03 200 - Concrete Reinforcing.
 - 1. All bars shall be detailed by fabricator and erector in compliance with the working drawings.
 - 2. No modifications to reinforcing steel shall occur in the field or otherwise without prior review by Structural Engineer.
- C. The Contractor shall be responsible for all errors of detailing, fabrication and for the correct fitting of the reinforcing bars. The Contractor shall make all measurements in the field as required to verify or supplement dimensions shown on the drawings and he will verify that all dimensions shown on the shop drawings are coordinated with the dimensions and requirements of the architectural and structural working drawings.
- D. Manufacturer shall submit certification of providing quality customized masonry block for a minimum period of ten (10) continuous years or more.

1.2 DELIVERY, STORAGE, AND HANDLING

- A. Deliver concrete masonry units to job site in undamaged condition. Handle units to prevent chipping, breaking and other damage.
- B. Store materials on wood pallets above ground and under waterproof cover in a dry place and prevent damage by intrusion of foreign matter.
- C. Keep units dry. Allow air circulation around stacked units. Remove wet units from site.

1.3 PROJECT CONDITIONS

A. Environmental Requirements

1. Lay no concrete masonry units when temperature of surrounding air has dropped below 45 degrees F., unless it is rising; and at no time when it has dropped below 40 degrees F., except with permission from the Structural Engineer.
 2. When concrete masonry unit work is authorized at temperatures below 40 degrees F., but above freezing, see Section 3.8.
 3. Protect concrete masonry unit construction for 48 hours following installation from direct exposure to wind and sun when erected in ambient air temperatures of above 95 degrees F. in the shade with relative humidity less than 50%.
 4. When concrete masonry work is executed in temperatures above 90 degrees Fahrenheit, follow the criteria listed below:
 - a. Lightly wet the mortar bedding surface areas.
 - b. Keep mortar moist, and do not string out on the wall so far ahead of units being placed that drying will take place prior to placement of units.
 - c. After the units are in place, a very light fog spray should be applied three times during the first 24 hours at eight hour intervals.
- B. Keep CMU walls dry during erection by covering at end of each work period with a waterproof membrane. Similarly protect partially completed walls not being worked on. Covering shall overhang at least 2'-0" on each side of wall and shall be anchored securely.
- C. Install and have mechanical, plumbing and electrical work reviewed prior to enclosing or covering with concrete masonry units. Where runs of piping or conduit are required, cut away web of masonry unit without disturbing face of bond.
- D. Do not apply uniform roof loads for at least 12 hours or concentrated loads for at least 3 days after building masonry walls or columns.

1.4 QUALITY CRITERIA

- A. The masonry contractor selected shall have a minimum of five (5) years experience in quality commercial grade construction and shall have successfully completed comparable work on time and in an acceptable workman-like manner.
- B. Testing agency paid for by the Owner shall perform full time supervision and inspection for all reinforcement bar placement in CMU and all grout placement, verifying conformance with the drawings and specifications in accordance with Section 1704.5 of the 2006 International Building Code with 2007 and 2009 Georgia Amendments. See Section 01 400, Paragraph 1.3.E.2.

- C. Maximum variation from plumb shall not exceed $\frac{1}{4}$ " in 10'-0" and $\frac{3}{8}$ " in 20'-0".
- D. Maximum variation from level shall not exceed $\frac{1}{4}$ " in 20'-0" and $\frac{1}{2}$ " in 40'-0" or more.
- E. Maximum variation in linear building line from location indicated shall not exceed $\frac{1}{2}$ " in 20'-0".

1.5 SAMPLE WALL PANEL

- A. A sample wall panel shall be constructed of unit masonry and mortar in location as directed by the Architect. Panel shall be four feet high and "L" shaped with overall length of legs 32" and 72".
- B. Panel construction shall indicate the following:
 - 1. Running Bond
 - 2. Mortar color (if required)
 - 3. Joint tooling
 - 4. Unit color and texture
 - 5. Workmanship
 - 6. Horizontal reinforcing
- C. Prepare panel at least seven days prior to beginning concrete masonry work. Should panel be rejected, prepare additional panels until accepted by the Architect. Do not proceed with concrete masonry work until sample panel is accepted by architect.
- D. Maintain panel throughout work as standard of concrete masonry work. Do not destroy panel until directed by the Architect. Panel may be a portion of the permanent work.

II. PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Hollow Units

- 1. Units shall comply with ASTM C90, grade N-1, table 1 with compressive strength as noted below.
- 2. Nominal face dimensions shall be 8" high x 16" long x $4\frac{5}{8}$ " deep as shown on drawings.
- 3. Provide solid units at tops of low partitions where shown on drawings.
- 4. The required unit compressive strength shall be:
 - a. 1900 PSI on the net area if no prism testing is performed. If a prism test is not performed, a certificate must be provided by the CMU manufacturer which states that the unit compressive strength on the net area of the CMUs supplied shall be 1900 PSI or greater.

- b. Alternate Method - Preliminary prism tests shall be conducted in accordance with Section 3.2 of "Specification for the Design and Construction of Load-Bearing Concrete Masonry" (NCMA - 1970) and Method B of "Standard Methods of Test for Compressive Strength of Masonry Assemblages" ASTM E-447-2 to establish the ultimate compressive strength, f'_m , of the in-place masonry. The established f'_m shall be equal to or greater than 1,500 PSI.
5. The required fire resistive ratings of the concrete masonry load-bearing walls shall be established by either recognized testing laboratory certification of hours or by "Certificate of Equivalent Thickness of Unit" from the manufacturer, established in accordance with ASTM-C140 if acceptable to all code authorities.

When using the equivalent thickness to establish fire rating, concrete masonry units shall be of minimum equivalent thickness for the fire rating and corresponding type of aggregates indicated in Table 1 below. Units containing more than one of the aggregates listed in the table will be rated on the aggregate requiring the greater minimum equivalent thickness to produce the required fire rating.

TABLE 1

Aggregate Type	Minimum Equivalent Thickness in Inches for Fire Rating of:		
	4 Hours	2 Hours	1 Hour
Pumice	4.7	3.0	2.1
Expanded Slag	5.0	3.3	2.1
Expanded Clay, Shale or Slate	5.7	3.7	2.6
Limestone, Scoria, Cinders or Unexpanded Slag	5.9	4.0	2.7
Calcareous Gravel	6.2	4.2	2.8
Siliceous Gravel	6.7	4.5	3.0

Note: Minimum equivalent thickness shall equal net volume as determined in conformance with ASTM C 140 and International Building Code, 2006 Edition, with 2007 and 2009 Georgia Amendments, divided by the product of the actual length and height of the face shell of the unit in inches. Where walls are to be faced with brick, or otherwise form an assembly, the thickness of other material in the assembly will be included in determining the equivalent thickness.

- B. Units shall be manufactured with either regular lightweight aggregate which complies with ASTM C331 or standard weight aggregate complying with ASTM C33.
- C. Fire rated units shall be U.L. rated for the number of hours indicated on the drawings.
- D. Use bull-nosed units at all exposed outside corners. Use double bull nosed units where both edges are exposed. Where bull-nosed units are required at fire rated units and are not available, Contractor shall field grind bullnose on all exposed outside corners.
- E. Units shall have a maximum absorption of 18 #/cubic foot.
- F. Prior to the date of substantial completion, a certified U.L. certificate shall be issued for the exact quantity of CMU shipped.
- G. Neither the concrete masonry units, their materials nor manufacturing process shall contain any asbestos or PCB's.

2.2 PRE-CAST CONCRETE LINTELS

- A. Contractor may provide pre-cast concrete lintels as an alternate to conventional CMU lintels. Contractor must submit data to certify structural design meets Engineer's requirements and all local Codes.

III. PART 3 - EXECUTION

3.1 PREPARATION

- A. Inspect surfaces supporting and adjacent to concrete masonry to assure completion to proper lines and grades free of all deleterious material. Do not start work until surfaces not properly prepared have been satisfactorily corrected.

3.2 WORKMANSHIP

- A. Lay only dry, clean, undamaged concrete masonry units.
- B. Lay concrete masonry plumb, level and true to line with accurate coursing as indicated on drawings.
- C. Lay concrete masonry units in running bond unless otherwise noted on the drawings.
- D. Cutting of exposed concrete masonry shall be done with an abrasive power saw. Layout wall to avoid units shorter than 8".
- E. Stop horizontal runs at end of workday by racking back in each course. Tothing will not be permitted.

- F. All partitions shall be reinforced and grouted per drawings and doveled into the slab.
- G. Adjust units to final position while mortar is soft and plastic. If units are displaced after mortar has stiffened, remove unit, clean joints and units of mortar and re-lay with fresh mortar.
- H. When joining fresh masonry to set or partially set masonry, remove loose unit and mortar and clean exposed surface of set masonry prior to laying fresh masonry.
- I. Where unacceptable qualities of concrete masonry wall surfaces are provided due to either poor workmanship or planning, the walls shall be removed and replaced. In these conditions, where acceptable to the Owner and at no expense to the Owner, the Contractor may provide a surface applied finish, such as gypsum drywall, plaster or stucco.
- J. Particular attention shall be paid to joints in blockwork since the blockwork is the finished wall. CMU with imperfections allowed by ASTM C90 may be used above ceiling.

3.3 INCLUSION OF OTHER WORK

- A. Allow for work of other trades indicated to be built in with masonry including anchors, wall plugs, expansion joints and accessories as erection progresses. Avoid cutting and patching. Space and align built-in items and exercise care not to displace other materials from position. Solidly grout spaces around built-in items.
- B. Where electrical receptacle or switch boxes occur in exposed concrete masonry walls, grind and cut units accurately before building into wall. Coordinate construction with electrical contractor. Anticipate thicknesses of furred out material correctly.
- C. Fill hollow metal frames in masonry walls with cement grout as wall is laid. Mortar will not be acceptable as a substitute. Rake back ½" deep, ¼" wide joint between hollow metal frame and adjacent masonry to receive sealant or caulking compound. CMU adjacent to hollow metal jambs shall be reinforced and shall have a minimum of two cells filled with grout.
- D. Lay concrete masonry to receive flashing with smooth joints free from projections which might puncture flashing materials. Provide mortar on both sides of flashing in concrete masonry joints.
- E. Unless indicated otherwise, provide minimum 8" of solid end bearing full height of wall from floor to bearing points for lintels, beams and other load-supporting members by either solid block or filling cores with grout.

- F. Provide lintels and bond beams where indicated using lintel concrete masonry units laid with joints matching adjacent work. #4 horizontal reinforcement shall be provided, unless noted otherwise on the drawings and CMU shall be filled with grout.
- G. Where indicated on structural drawings, reinforce vertical concrete block cells, and grout solid. Reinforcement shall be as specified in Section 03 200 and indicated on the drawings.
- H. Keep chases, recesses, expansion joints, etc., free of mortar and other debris.

3.4 MORTAR JOINTS

- A. Bed joints at unreinforced partitions
 - 1. Lay first course in full bed of mortar.
 - 2. On all other bed joints, apply mortar on face shell only of concrete masonry unit already laid.
 - 3. On concrete masonry unit to be laid, apply a beveled buttering to face shell to ensure full bed joints.
- B. Apply mortar to vertical face shells on both the concrete masonry unit already laid and the unit to be laid to ensure full head joint.
- C. Place concrete masonry unit by rolling it to a vertical position and shoving it against adjacent unit, achieving position and alignment with minimum of adjusting.
- D. Check each unit as laid with mason's level for level and for plumbness with wall below.
- E. Keep bed and head joints uniform in width except for minor variations required to maintain bond and locate returns. Standard thickness for both horizontal and vertical mortar joints shall be $\frac{3}{8}$ ".

3.5 JOINT TREATMENT

- A. Strike exposed joints flush, then tool joint concave with 24" long tool after mortar sets to "thumb-print" hardness.
- B. Strike all other joints flush, including above ceiling.

3.6 GROUTED MASONRY CELLS

- A. Grouting shall take place under supervision and inspection described in Paragraph 1.4.B of this section.
- B. Where vertical reinforcing is designated on drawings, hold firmly in place with suitable devices. Provide minimum clear distance between bars in columns equal to 1-½ times bar diameter. Provide minimum

thickness of grout between masonry and reinforcement of $\frac{1}{4}$ ". Provide dowels into slab at all vertical reinforcing.

- C. Fill cells designated to be filled on the drawings solid from foundation to top of wall or beam bearing.
- D. Provide 12 square inch inspection and clean out holes at bottom of each wall with filled cells to ensure full grouting when utilizing high-lift grouting procedures. Clean all mortar droppings from cell prior to grouting. See Section 04 100 - Mortar and Section 04 105 - Masonry Grouts for further information.
- E. Fill all cells solid with grout below finished grade.

3.7 CONTROL JOINTS

- A. Make all control joints $\frac{3}{8}$ " wide, unless noted otherwise.
- B. Stop $\frac{1}{2}$ of horizontal joint reinforcement 1" from control joint. Bond beam reinforcement shall remain continuous.
- C. Rake joint $\frac{3}{4}$ " deep on both sides of the wall.
- D. Provide vertical control joints at the following locations:
 - 1. Changes in wall height.
 - 2. Changes in wall thickness except at pilasters unless noted.
 - 3. Control joints in floors and roofs (all joints to match).
 - 4. In long straight walls at a maximum spacing 3 times the wall height not to exceed 25 feet or as noted on working drawings.
- E. Leave joint open and clean and caulk in accordance with the requirements of Section 07 900 - Joint Sealants.

3.8 COLD WEATHER MASONRY CONSTRUCTION

- A. Ice or snow that has formed on the masonry bed shall be thawed by application of heat. Apply heat carefully until top surface is dry to the touch. Any section of completed masonry work that is deemed frozen and damaged by Owner or Architect shall be removed before continuing construction of that section.
- B. Use only dry masonry units. Wet or frozen masonry units shall not be laid. No wetting of concrete masonry units will be permitted.
- C. Construction Requirements
 - 1. For air temperatures between 32 and 40 degrees F, sand and mixing water shall be heated to produce mortar temperatures ranging from 40 degrees to 120 degrees F.
 - 2. For air temperatures between 25 and 32 degrees F, sand and mixing water shall be heated to produce mortar temperatures

ranging from 40 degrees to 120 degrees F. Maintain temperature of mortar on boards above freezing.

3. For air temperatures between 20 and 25 degrees F, sand and mixing water shall be heated to produce mortar temperatures ranging from 40 degrees to 120 degrees F. Maintain mortar temperatures on boards above freezing. Provide sources of heat on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 15 mph.
4. For air temperatures of 20 degrees F and below, sand and mixing water shall be heated to provide mortar temperatures ranging from 40 degrees to 120 degrees F. Enclosure and auxiliary heat shall be provided to maintain air temperature around wall above freezing. Temperature of masonry units when laid shall be not less than 20 degrees F.

D. Protection of Completed Work

1. During mean ambient temperatures of 32 to 40 degrees F, freshly laid masonry shall be protected from rain and snow for 24 hours following installation by covering with weather-resistive membrane.
2. During mean ambient temperatures of 25 to 32 degrees F, freshly laid masonry shall be completely covered with weather-resistive membrane for 24 hours following installation.
3. During mean ambient temperatures of 20 to 25 degrees F, freshly laid masonry shall be completely covered with insulating, weather-resistant blankets for 24 hours following installation.
4. During mean ambient temperatures of 20 degrees F and below, masonry temperature shall be maintained above freezing for 24 hours following installation by enclosure and supplementary heat such as electric heating blankets, infrared heat lamps or other methods acceptable to the architect.

3.9 CLEANING AND POINTING

- A. Keep masonry work free of mortar droppings as work progresses and, at completion of work, rub masonry with stiff bristle brush or carborundum brick to remove excess mortar.
- B. Point mortar joints. Remove and replace units with excessive spalls or chips.

3.10 MASONRY CORNERS

- A. At all unreinforced corners in concrete masonry unit construction, every vertical course shall be reinforced with masonry fabric lapping at least 8" in each direction of wall.

3.11 PROTECTION OF MATERIAL FROM DAMPNESS

- A. At the time construction materials are received on site, they shall be inspected for dryness, and any material not completely free of dampness shall be rejected and replaced prior to being set into the building areas. If materials are to be stored on site prior to use in construction, they shall be stored on pallets, visibly off the ground and away from any ponding or puddling of ground water. The stored material shall further be completely protected from rain and other moist weather with plastic sheeting, which shall be adequately vented to avoid condensation build-up.

- B. Once built into the construction, even though the building may not be dried-in, the materials shall be protected from becoming wet by rain or other moist weather with plastic sheeting to cover voids in block or cavities between block and veneer.

END OF SECTION

SECTION 05 121

STRUCTURAL STEEL

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Shop drawings shall include all details for the steel fabrication and erection.
 - 1. All members and connections shall be detailed by the fabricator and erector.
 - 2. Details shall include cuts, copes, connections, holes, bolts and welds. Welds shall be indicated by standard welding symbols of the AWS. Shop and field welding shall be distinguished by symbols.
- B. The Contractor shall be responsible for all errors of detailing, fabrication and for the correct fitting of the structural members. The Contractor shall make all measurements in the field as required to verify or supplement dimensions shown on the drawings and he will verify that all dimensions shown on the shop drawings are coordinated with the dimensions and requirements of the Architectural plans, elevations and sections.
- C. If steel does not fit up, the Contractor shall prepare and submit drawings showing his proposed corrective measures. No modifications shall be made to the steel until such drawings have been reviewed by the Architect.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Structural material, either plain or fabricated, shall be stored above ground free from dirt, grease and other foreign matter and protected from corrosion.
- B. Dropped steel which has fallen more than three feet or steel which has received a sudden blow which damages the strength shall not be acceptable for the work of this section.

1.3 QUALITY CRITERIA

- A. All structural steel shall comply with the American Institute of Steel Construction (AISC), 13th Edition of "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings" with commentary except as otherwise specified in this section.

- B. Welding shall comply with the American Welding Society Code D 1.1/D1.1 M:2002.
- C. High-strength bolt construction shall comply with AISC Specification for Structural Joints using ASTM A325 or A490 bolts.
- D. Welds shall be made only by welders and welding operators who have been previously qualified by tests as prescribed in the Standard Code for Welding in Building Construction of the American Welding Society. Submit welder's certification.

1.4 CERTIFICATIONS

- A. The Contractor shall furnish two certified copies of all mill reports covering the chemical and physical properties of the steel used. Reports shall be of steel made within the last 60 days before shipment.
- B. Inspection of welding shall comply with the requirement of Paragraphs 6.1 thru 6.5 of AWS D1.1. Inspection of preparation of materials and welding shall be by the visual method as covered in AWS D1.1. Inspection shall cover all full or partial penetration welds. Welds by the Fabricator shall be inspected. Such welds shall be indicated on the shop drawings, with the appropriate reference joint number as covered in the AISC 13th Edition. If visual inspection indicates defects, additional testing, including but not limited to non-destructive methods or proof testing, may be required at the discretion of the Owner to be paid for by the Contractor. See also Specification Section 01 400, 1.3.G.

II. PART 2 - PRODUCTS

2.1 STEEL MATERIALS

- A. Structural steel shall be within trade tolerances, new, undamaged and without splices.
 - 1. Structural beam W shapes shall comply with ASTM A992 (Fy = 50 KSI)
 - 2. Structural steel, miscellaneous plates, bars, angles, etc. shall comply with ASTM A36/A36 M.
 - 3. Structural tubing shall comply with ASTM A500 Grade B.
 - 4. Steel pipe shall comply with ASTM A53, Grade B.
 - 5. Bolts, nuts and washers shall comply with the following requirements:
 - a. High-strength bolts shall be ¾" in diameter, shall include nuts and washers and shall comply with ASTM A325. Other bolts and nuts shall comply with ASTM A307, Grade A except anchor bolts shall comply with ASTM F 1554, Grade 36.

- b. Plain washers, other than those in contact with high-strength bolt heads and nuts, shall comply with ANSI Standard B27.2.
6. Electrodes for manual metal-arc welding shall conform to Classification E7015, E7016, or E7018.
7. Bolts for attaching steel to concrete shall be one of the following:
 - a. "Trubolt Wedge" ITW by Ramset/Red Head, Michigan City, Indiana 46360.
 - b. "Parabolt" by the Molly Company, 504 Mt. Laurel Avenue, Temple, Pennsylvania 19560
 - c. "Kwik-Bolt" by McCulloch Industries, 1125 Washington Avenue, South, Minneapolis, Minnesota 55415
 - d. "Weg-it" by Expansion Products, Inc., Industrial Park, Broomfield Colorado 80020
 - e. "Taper Bolt" by U.S. Expansion Bolt Company, Post Office Box 1589, York, Pennsylvania 17405
8. Holes for expansion bolts shall be made by first securing the steel item in place, then drilling the holes through the holes in the steel using the steel as a template. Drilling of the holes by center measurement will not be permitted. Reaming or burning of the holes in the steel will not be permitted. The drill size shall be of the same diameter as the bolt.

2.2 PAINT

- A. All structural steel shall receive primer. Primer paint shall comply with Federal Specification TT-P-86e, Type II, ready-mixed rust-inhibiting paint, or Steel Structures Painting Council SSPC-Paint 14.
- B. All exposed steel shall be finish painted per Specification Section 09 900.

III. PART 3 - EXECUTION

3.1 SHOP WORK

- A. Fabrication and assembly shall be done in the shop to the greatest extent compatible with shipping and handling limitations.
- B. All shop connections shall be welded.
- C. All steel members shall be free from twists, kinks, buckles and open joints. Parts assembled with rivets or bolts shall be in close contact, except where separators are required. All members shall be so accurately made that, when assembled, the parts shall come together without shimming.
- D. Priming
 1. Prepare steel for painting in accordance with the AISC Specification and prime with paint materials specified in this section.

2. Shop paint structural steel work to be embedded in concrete or mortar. Paint embedded steel which is partially exposed on the exposed portions and the initial two inches of embedded areas only. Do not paint contact surfaces which are to be welded or high-strength bolted with friction-type connections.

3.2 CONNECTIONS

- A. Surfaces of joints for welded or bolted connections shall be clean, bright metal.
- B. Splices shall be permitted only where shown on the drawings.
- C. Beam and girder connections shall meet the requirements of the Tables I and II and Part 4, AISC Code 13th Edition, unless otherwise called for on the plans.
- D. Except as otherwise indicated by the design, all connections of beams and girders shall be designed as flexible and may ordinarily be proportioned for the reaction shears equal to $\frac{1}{2}$ total capacity of beam. If, however, the connection is eccentric, provision shall be made for the resulting moment.
- E. Where final connection is to be welded, provision shall be made for securing the members together during erection and alignment.
- F. Except where called for otherwise, field connections shall be bolted.
- G. Fabricator shall punch all holes for the attachment of nailers, hangers or other work to the steel.

3.3 HOLES

- A. All holes shall be at right angles to the surface of the metal and shall not be made or enlarged by burning.
- B. Provide holes in members to permit connecting work of other trades unless otherwise noted.
- C. Holes shall be cleaned out without torn or ragged edges. Remove outside burrs resulting from drilling or reaming operations.
- D. Welding for redrilling will not be permitted.

3.4 CUTTING TORCH

- A. The use of a gas-cutting torch in the field for correcting fabrication errors shall not be done on any major member in the structural framing. The use of a gas-cutting torch is permissible only on minor members, when the member is not under stress, and then only after

the specific conditions have been reviewed by the structural engineer and the use of torch is deemed acceptable by the engineer.

3.5 ERECTION

- A. Anchor bolts and other connections between the structural steel and foundations shall be provided and shall be located and built into connecting work.
- B. Bearing plates for beams, girders and similar members shall be provided.
 - 1. All bearing plates shall be provided with full bearing after the supported members have been plumbed and properly positioned. The area under the plate shall be dry-packed solidly with non-shrink grout as specified in Masonry Grouts - Section 04 105.
- C. After assembly, the various members forming parts of a completed frame or structure shall be aligned and adjusted accurately before being fastened. Tolerance shall conform to AISC Specifications.
- D. It shall be the responsibility of the Contractor to secure steel against displacement during erection and to maintain it against displacement until the erection of all steel is completed, all floor and roof decks are in place and all masonry is completed.
- E. As erection progresses, the work shall be securely fastened to take care of all dead load, wind and erection stresses.

3.6 FIELD PRIMING

- A. After erection, the field bolt heads and nuts, field welds and any abrasions in the shop coat shall be cleaned and primed with paint to match that used for the shop coat, except at areas to receive spray-on fireproofing. The dry primer film shall be two mils thick.

END OF SECTION

SECTION 05 505

METAL FABRICATIONS

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit shop drawings showing construction details, materials with their thickness, methods of jointing, concealed fastenings, reinforcements, structural supports and anchorage for all items within this section.

1.2 QUALITY CRITERIA

- A. Upon completion of fabrication and before leaving the shop, all material shall be thoroughly cleaned of loose mill scale, loose rust, weld slag or flux deposit, dirt, oil, grease and other foreign matter.
- B. After cleaning, all material shall receive one coat of shop primer.
- C. Material which will be exposed and receive finish coats of paint shall have shop coat either brushed or sprayed on.
- D. Cast iron material and non-ferrous material require no shop primer.
- E. Material to be encased in concrete requires no shop primer.
- F. Standard shop primer shall be as specified in Section 09 900 - Painting.
- G. All galvanized material shall be grade G-90 hot-dipped, galvanized with not less than .90 oz. per square foot of zinc coating.
- H. All jointing of metal members shall be designed to develop the full strength of the members at the connection. Where members are bolted together not less than 2 bolts shall be used for each connection.
- I. All anchorage required to secure the work in place shall be as detailed on the shop drawings and furnished ready for installation. Special inserts for building into masonry or concrete members shall be delivered to the site in ample time to be built in as required. All machine screws, bolts and other accessories shall be furnished to complete the work.

II. PART 2 - PRODUCTS

2.1 MATERIALS

- A. All steel for metal fabrications, except galvanized products, shall comply with ASTM A 36/A 36M.
- B. Hot-dipped, galvanized steel products shall comply with ASTM A 123/A and A 123M or A 153A and A 153M.
- C. Steel lintels for exterior masonry shall be hot-dipped galvanized. See drawings for other galvanized materials.
- D. Stainless steel products shall be Type #302 of standard analysis 18-8 containing a minimum of 17% to 19% chromium, 8-10% nickel and .08% to .20% carbon. Provide and install sizes and gauges as indicated on the drawings or as specified by the Architect.
- E. Steel ladders shall be constructed of hot-dipped galvanized ASTM A 36/A 36M steel. Contractor shall field paint ladders in accordance with Section 09 900 - Painting. Ladders shall be as detailed on working drawings.

III. PART 3 - EXECUTION

3.1 GENERAL

- A. All work shall be laid out, cut and assembled by mechanics skilled in the fabrication of the different metals required so that the work will present a neat, satisfactory appearance in the building. Measurements shall be accurate, cutting true in line, joints tight and secure and all work in accordance with the best practices in modern fabricating shops.
- B. When a cutting torch is used, the burned edges of the metal shall be milled to dimension. All exposed edges of metal shall be milled smooth and straight.
- C. All required holes shall be drilled or punched, not cut with a torch. Punching or drilling shall be accurately done and any holes not matching shall be reamed and not drifted.
- D. Welding shall be done with electric arc equipment and executed in accordance with the "Code for Fusion Welding in the Building Construction" of the American Welding Society.
- E. The welding electrode shall conform to American Welding Society specifications. Welded joints in metal cut with a torch shall have the scale and burned metal ground or chipped back to bright metal before

welding. All welded joints that will be exposed to view shall have the welds so formed that the joints can and shall be ground smooth with the connected surfaces.

END OF SECTION

SECTION 05 521

STEEL PIPE AND TUBE RAILINGS

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit shop drawings for fabrication and erection. Include plans and elevations drawn at not less than 1" = 1'-0" scale, and include details of sections and connections drawn at not less than 3" = 1'-0" scale. Show anchorage, accessory items, sizes, gauges, dimensions, finishes, materials and installation details. Certify rails will accommodate a design load of 50 lb./l.f. and concentrated load of 200 lbs.

1.2 QUALITY CRITERIA

- A. Steel shall comply with American Welding Society Standard D1.1/D1.1 M:2002.
- B. Welding processes and welding operators shall be qualified in accordance with AWS "Standard Qualification Procedure".
- C. Take field measurements prior to preparation of shop drawings and fabrication, where possible, to ensure proper fitting of work. However, do not delay job progress. Allow for trimming and fitting wherever taking of field measurements before fabrication might delay work.
- D. Designs shall comply with latest edition of the International Building Code, Life Safety Code and Georgia Accessibility Code.

II. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel pipe shall be ASTM A53, Type S, Grade A.
- B. Pipe size at all stairwells and ramps shall be 1-1/4" o.d., 2.72 lbs. per foot, unless noted otherwise.
- C. Pipe at exposed conditions shall be hot dipped G-90 galvanized with not less than .90 oz. of zinc coating per square feet. Pipe at interior conditions shall receive shop primer.

- D. Provide standard bolts, nuts, expansion bolts, brackets and all other accessories appropriate, necessary and adequate for quality installation.
- E. Primer paints shall be as specified in Section 09 900 - Painting.

2.2 FABRICATION

- A. Use materials of size indicated. Work to dimensions shown on reviewed shop drawings using proven details of fabrication and support. Use materials indicated for the various components of work. Rail spacing must meet all local and state code requirements. See drawings for details.
- B. Handrail brackets shall be Julius Blum & Co. "#306", galvanized at exterior, primed and painted at interior. Brackets shall be anchored with two-part Hilti epoxy with 3/8" inserts.
- C. Form work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to radius of approximately 1/32".
- D. Weld corners and seams continuously and in accordance with recommendations of AWS. Grind exposed welds smooth and flush, to match and blend with adjoining surfaces.
- E. Provide for anchorage as indicated on reviewed shop drawings coordinated with supporting structure. Fabricate and space anchoring devices as required to provide adequate support.
- F. Join posts, rails and corners by mitered and welded joints. Fit posts to top rail and intermediate rails to posts, mitering corners, grooving welding joints and grinding smooth. Butt railing splices and reinforce by a tight fitting interior sleeve not less than 6" long.
- G. Railings may be bent at corners instead of joining, provided the bends are uniformly formed in jigs with cylindrical cross-section of pipe maintained throughout the entire bend.
- H. Adjust railings prior to securing in place to ensure proper matching at butting joints and correct alignment throughout their length. Space posts not more than 6'-0" o.c. and plumb posts in each direction. Secure posts as indicated on shop drawings. Return ends of rails to within 1/8" of adjacent walls.

2.3 SHOP CLEANING AND PAINTING

- A. Upon completion of fabrication and before leaving the shop, all material shall be thoroughly cleaned of loose mill scale, loose rust, weld slag, flux deposit, dirt, oil, grease and other foreign matter.

- B. After cleaning, all material shall receive galvanizing for exterior conditions and shop primer for interior conditions.
- C. Material which will be exposed and receive finish coats of paint shall have shop coat either brushed or sprayed on.
- D. Galvanized material, cast iron material and non-ferrous material require no shop primer.
- E. Material to be encased in concrete requires no shop primer.
- F. Shop primer shall be one of the following products:
 - 1. Glidden- Rustmaster #585
 - 2. Pittsburgh Plate Glass Co. - Inhibitive Red Primer # 6-203
 - 3. Rust-Oleum - No. 769 Damp-Proof Red Primer
 - 4. Southern Coating and Chemicals Co. - Red Primer I-2588

III. PART 3 - EXECUTION

3.1 PREPARATION

- A. Provide 8" long galvanized steel inserts and anchoring devices which must be set in "por rok" concrete for installation of rails. Coordinate delivery with other work to avoid delay.
- B. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete construction. Coordinate the delivery of such items to the project site to avoid delay.
- C. Preassemble items in shop to greatest extent possible so as to minimize field splicing and assembly of units at project site. Disassemble units only to extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

3.2 INSTALLATION

- A. Provide anchorage devices and fasteners where necessary for securing handrails to in-place construction. Include all connectors required.
- B. Perform cutting, drilling and fitting required for installation of stair work. Set work accurately in location, alignment and elevation. Ensure that work is plumb and level, true and free of rack and measured from established lines and levels. Install work in accordance with reviewed shop drawings.

- C. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but can not be shop-welded because of shipping size limitations. Grind joints smooth and touch-up shop coat as required by Architect.

3.3 FIELD PAINTING

- A. Touch up shop coat with identical primer to protect all ferrous metal from rusting.
- B. Finish coats shall be applied in accordance with Specification Section 09 900 - Painting.

END OF SECTION

SECTION 06 100

ROUGH CARPENTRY

I. PART 1 - GENERAL

1.1 SUBMITTALS

A. Certifications

1. Submit certification by treating plant stating that preservative treatment chemicals and process used, as well as net amount of salts retained conform with applicable standards.
2. Submit certification by treating plant that fire retardant treatment materials comply with governing ordinances and that treatment will not bleed through finished surfaces.

B. Submit manufacturer's descriptive literature indicating material composition, thickness, dimensions, loading and fabrication details.

C. All wood materials used in the construction of this project, including but not limited to, blocking, nailers, sheet products and framing shall be pressure treated with salt preservatives at exterior and fire retardant treated at interior.

D. Submit manufacturer's literature indicating installation details. Include locations and details of bearing, blocking, bridging, and cutting and drilling of webs for work by others.

1.2 DELIVERY, STORAGE AND HANDLING

A. Immediately upon delivery to job site, place materials in areas protected from weather.

B. Store materials a minimum of 6" above ground on blocking and cover with protective waterproof covering, providing for adequate air circulation and ventilation under covering and around stacks of materials. Store and handle materials to protect against contact with damp and wet surfaces, exposure to weather, breakage and damage. Individual joists shall be handled in the upright position.

C. Do not store seasoned materials in wet or damp portions of building.

D. Protect all materials from damage.

1.3 QUALITY CRITERIA

- A. Grading rules of the following associations apply to materials furnished under this section:
 - 1. Southern Pine Inspection Bureau (SPIB)
 - 2. West Coast Lumber Inspection Bureau (WCLB)
 - 3. Western Wood Products Association (WWPA)
 - 4. Redwood Inspection Service (RIS)
- B. Softwood plywood grading rules shall comply with Construction and Industrial Product Standard PS-1.
- C. Identify all lumber and plywood by official grade marks.
 - 1. Grade stamp for lumber shall contain symbol of grading agency, mill number or name, grade of lumber, species or species grouping or combination designation, rules under which graded, where applicable and condition of seasoning at time of manufacture.
 - 2. Provide appropriate grade trademark of the American Plywood Association on softwood plywood indicating the following:
 - a. Type, grade, class and identification index
 - b. Inspection and testing agency mark
- D. Preservative-treated material shall comply with specified standards of the American Wood Preservers Association (AWPA) and American Wood Preservers Institute (AWPI). All preservative-treated materials shall be pressure treated with salt preservatives as required for above-ground exposure.
- E. Fire-retardant treated material shall comply with specified standards of the American Wood Preservers Association (AWPA). All fire retardant treated wood products shall bear an Underwriter's Laboratories, Inc. label.
- F. Prior to initiation of any structural wood framing, the Contractor shall schedule a meeting at the job site with the Architect, Owner's Representative, Framing Subcontractor and all other related Sub Contractors to discuss Sequencing, Schedule, and other framing related criteria.

II. PART 2 - PRODUCTS

2.1 LUMBER

- A. Indicated lumber dimensions are nominal. Actual dimensions conform to industry standards established by the American Lumber Standards Committee and the rules writing agencies.

- B. Moisture content of rough framing lumber shall be 18% maximum at time of permanent closing in of building or structure, except as otherwise noted.
- C. Lumber shall be surfaced on four sides (S4S).
- D. Lumber, 2" to 4" thickness, shall be the following grades:
 - 1. Plates, blocking, bracing, furring and nailers shall be utility grade or No. 3 southern pine. Lumber in contact with concrete slabs, exterior masonry walls or in conjunction with gravel stops and copings shall be preservative treated in accordance with specified standards. Lumber shall be minimum 2 x 6.
 - 2. All interior lumber shall be fire treated unless noted otherwise.

2.2 SHEET MATERIALS

A. Decking/Sheathing

- 1. Roof decking shall be APA Rated Sheathing 32/16, 19/32", Exposure I.
- 2. Wall sheathing shall be APA Rated Sheathing 24/16, 15/32", Exposure I.

2.3 FIRE-RETARDANT TREATED MATERIALS

A. Standards

- 1. Lumber shall comply with AWPA C-20-99.
- 2. Plywood shall comply with AWPA C-27-99.

2.4 PRESERVATIVE TREATED MATERIALS

A. Standards

- 1. Lumber shall comply with AWPA C-2-99.
- 2. Plywood shall comply with AWPA C-9-99.

2.5 ROUGH HARDWARE

- A. Provide all nails, bolts, spikes, plugs, wall plugs, anchors and such other rough hardware for securing work in place.
- B. Aluminum ply clips shall be installed at midspan of decking. Use two for 48" or greater spans and one for lesser spans.
- C. Anchors for securing wood nailers to steel deck shall be 8-18 X 1-15/16" flat head screws teks/3 18" o.c. staggered.

2.6 ACCESSORIES

- A. Building paper shall comply with ASTM D226, 15 lbs./100 sq. ft., nonperforated.

III. PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. All wood members shall be cut square on bearing, closely fitted, accurately set to required lines and levels and rigidly secured in place.
- B. Accurately layout the work to provide correct openings to receive work of other trades.
- C. Cover and protect rough carpentry from damage.
- D. Install all wood members as required by the construction documents and/or necessary for proper installation of other project components.
- E. Leave 1/16" space at end joint and 1/8" at edge joints of plywood.

3.2 TEMPORARY SUPPORTS

- A. Wood framing or other necessary supports for openings in masonry walls shall be accurately and strongly made. Properly brace and secure in position until masonry has thoroughly set.
- B. Wood members shown on the drawings and as required shall be provided and installed by the Contractor. Wood members shall be secured firmly with anchors at not more than 24" on center.

3.3 SHEET MATERIAL INSTALLATION

- A. Install plywood sheathing and decking with face grain perpendicular to supports. Terminate panels over supports. Stagger end joints of adjacent panels.
 - 1. Allow 1/16" between end joints and 1/8" between edge joints for expansion.
 - 2. Attach plywood using screws at 6" on center along each metal support.

3.4 STORAGE AND PROTECTION

- A. Stack all wood products to ensure proper ventilation and drainage. Protect lumber from the elements. Store materials under cover in a well ventilated building where not exposed to extreme changes of temperature or humidity.

3.5 FIRE RETARDANT TREATED WOOD IN CONTACT WITH METALS

- A. Wherever fire retardant treated wood products are in contact with galvanized steel and copper metal materials, a 30 mil bituminous coating shall be applied between the wood and metal.

3.6 WOOD BLOCKING

- A. Provide fire retardant treatment wood blocking in all metal stud walls at locations for markerboards, tackboards, Owner-installed TV brackets, and any other items shown on drawings that attach to metal stud and gypsum board walls.

END OF SECTION

SECTION 06 240

PLASTIC LAMINATES

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit manufacturer's data, including product specifications, methods of construction/assembly, and cleaning/maintenance procedures.
- B. Colors given are basis of design. Submit 2" x 3" samples of plastic laminate colors for owner's final selection.

1.2 QUALITY CRITERIA

- A. Plastic laminates shall comply with the following requirements:
 - 1. NEMA Standard #LD3-Section 4, Architectural Woodwork Quality Standards
 - 2. Federal Specifications - #L-P-508H, Style D, Type I, Class 1, ISO 4586-2 and Style ND, Type IV
 - 3. NSF International Standard 35 for work contact, splash and non-work contact surfaces.
 - 4. N.W.M.A. Industry Standard
 - 5. ANSI A161.2
 - 6. Decorative Laminate Products Association (DLPA)
- B. Ensure that all materials are in compliance with the flame spread and smoke contribution requirements of ASTM E-84.
- C. Handle items to prevent damage to edges and surfaces. Replace all damaged work.
- D. All cabinets and/or countertops shall be provided in compliance with all governing codes for handicap accessibility.

1.3 SUBSTITUTIONS

- A. Manufacturers having products similar in type, function and quality to those specified may request acceptance of those products in accordance with substitution provisions of Section 01 630 - Products and Substitutions. Provide all materials from one source.

II. PART 2 - PRODUCTS

2.1 GENERAL

- A. Acceptable manufacturers: Wilsonart, Formica, Nevamar.
- B. Plastic laminates shall be 1/16" thick.
- C. Plastic laminates shall be decorative general purpose type.
- D. Plastic laminates shall comply with local Code requirements.
- E. Countertops and backsplashes shall be HGP Type 350 by Wilsonart (Type HF-4 by Nevamar) and shall be cigarette resistant for not less than 140 seconds when compared with NEMA minimum values.
- F. Cabinet fronts shall be HGS Type 107.
- G. Cabinet interior surfaces shall be VGP Type 335 by Wilsonart (Type VF-3 by Nevamar), including drawers and shelves.
- H. All countertops shall have plastic laminate Grade 72 back-up sheets underneath.
- I. Plastic laminate final color selections are to be selected by Owner. Basis of design for all areas except Cosmetology shall be:
 - 1. Counter tops
 - a. Wilsonart #4656-60 "Bronze Legacy"
 - b. Formica #503 "Stone Grafix"
 - c. Nevamar #MR-6-1T "Gray Matrix"
 - 2. Cabinets
 - a. Wilsonart #D327-60 "Pepperdust"
 - b. Formica #929-58 "Oyster Gray"
 - c. Nevamar #S-2-69T "Bethany Beige"
 - 3. Cabinet interior surfaces - White.
- J. Cosmetology plastic laminate colors shall be:
 - 1. Countertops and cabinets
 - a. Arborite #W-448FP "Afromosia Nigeria".
 - 2. Cabinet interior surfaces
 - a. Wilsonart #4830K-07 "Satin Stainless".

2.2 ADHESIVE

- A. Laminate shall be bonded to the core material using adhesives and techniques as recommended by the manufacturer and ANSI performance standards for fabricated high pressure decorative laminates.

2.3 BACKING SHEETS

- A. Backing sheets shall be provided as necessary to balance assembly and prevent warping.

III. PART 3 - EXECUTION

3.1 CUTTING

- A. Where possible, laminate to base material prior to final trimming. Prevent cracking due to vibration during cutting and trimming.

3.2 LAMINATION

- A. Apply adhesive evenly, with no gaps, at rate recommended by manufacturer.
- B. Apply laminate to plywood core as indicated on the working drawings.
- C. The underside of partitions, tops and splashes with plywood core shall have a high pressure laminate backing sheet securely glued to core with the identical adhesive and under the identical circumstances as the face sheet.
- D. Do not adjust, re-position or remove laminate after contacting adhesive, unless explicitly required by adhesive manufacturer.
- E. The temperature of the materials (plastic laminate, substrate and adhesive) and the area in which the actual fabrication is to be done shall be not less than 65 degrees F with a relative humidity of not less than 35% and not more than 85%.
- F. Assembly of components shall be accomplished using procedures, materials and equipment reviewed by the Architect and the workmanship shall conform to established industry practices, conditions, procedures and recommendations.
- G. Neatly match all joints to a hairline crack maximum.
- H. All inside corners of cutouts in laminate shall be radiused as large as possible, with 1/8" R minimum. File edges of the radius smooth and free of cracks and crazes.
- I. Edges at corners shall be neatly beveled or mitered at approximately 20 to 45 degree angles.
- J. Protect plastic laminate from moisture, humidity, abrasives and other hazards. All damaged materials shall be replaced.
- K. All cabinets shall have backsplashes and sidesplashes against adjacent walls.

END OF SECTION

SECTION 06 400

ARCHITECTURAL WOODWORK

I. PART 1 - GENERAL

1.1 SCOPE

- A. Furnish all labor and material for the complete fabrication and installation of all architectural woodwork shown on drawings and specified herein. Architectural woodwork encompasses all interior woodwork in finished building.
- B. Contractor shall provide all trim, molding, furring, blocking, nailers, hardware and all incidentals such as scaffolding and protective coverings required to install architectural woodwork.
- C. Areas of new building shall receive new architectural woodwork per the Drawings.

1.2 SUBMITTALS

- A. Submit shop drawings which indicate all materials and methods of construction including elevations, sections, dimensions, anchorage, scribe strips, species and thicknesses of materials, locations of cut-outs, blocking, etc., and all other hardware specifications. Actual field measurements shall be performed before any fabrication begins. Installer shall be responsible for details and dimensions controlled by project conditions. Shop drawings shall indicate all field dimensions read beyond installer's control.
- B. Samples
 - 1. Submit 8-1/2" x 11" finished samples of each wood species to receive transparent finish for Owner's review.
 - 2. Submit samples of all hardware.
- C. Submit manufacturer's descriptive literature of all items including plastic laminate and hardware within this section for Architect's review.

1.3 PROJECT CONDITIONS

- A. The woodwork manufacturer and the contractor shall be jointly responsible to make certain that woodwork is not delivered until the building and storage areas are sufficiently dry so that the wood work will not be damaged by excessive changes in moisture content, dampness, humidity, dryness, heat or cold.

- B. Install no interior finish carpentry or millwork until spaces are enclosed, dry and capable of being heated. Maintain temperature between 55 degrees F and 75 degrees F for 72 hours before beginning installation and for duration of project.
- C. Woodwork manufacturer, general contractor, and plumber shall be jointly responsible for coordination of sinks with cabinetry, ensuring that sink cutouts shall leave adequate anchoring space for fixtures and trim. Sinks shall center on cabinet doors. Notify architect of any conflicts before fabrication.
- D. Handle items to prevent racking, warping and damage to finished surfaces. Repair or replace damaged work.
- E. Store materials in such a way to provide ventilation, minimize warping and twisting, and otherwise provide protection recommended by fabricator.
- F. Unfinished woods subject to bleaching by sunlight shall be protected until finish is applied.
- G. All millwork items shall be installed only when normal temperature and humidity conditions approximate the interior conditions that will exist when the building is occupied.
- H. Clearly mark all materials for identification.
- I. All finish materials shall be provided with a protective covering as allowed by AWI Standards.

1.4 QUALITY CRITERIA

- A. Materials and installation shall comply with the following standards:
 - 1. The latest edition of the "Quality Standards" of the Architectural Woodwork Institute shall apply and by reference is hereby made a part of this specification. Any reference to Premium, Custom or Economy quality grades in this specification shall be as defined in the AWI "Quality Standards." Affix the AWI quality grade stamp to each unit of product (e.g. each case panel or Bundle, etc.). The AWI quality grade stamp shall display grade as specified for each section of work.
 - 2. Any item not given a specific quality grade shall be Custom grade as defined in the AWI "Quality Standards."
- B. The accepted woodwork manufacturer must have a reputation for doing satisfactory work on time and shall have successfully completed comparable work. The fabricator or manufacturer will submit AWI Prequalification form. The architect reserves the right to review the woodwork manufacturer selected to furnish all of the woodwork.

- C. All cabinets and shelving shall comply with the flame spread requirements of ASTM E-84, and all local Code requirements.
- D. All cabinets shall be constructed to meet latest edition of ANSI, Georgia Accessibility Code, and Americans with Disabilities Act (ADA).
- E. Work shall be straight, plumb, level and in true alignment. Fit all joints closely and fasten all pieces rigidly in place. Nails used for finish work shall be countersunk and left to be puttied. Neatly match all joints and leave work clean and free from warp, twist, open joints or other defects. Provide protection until completion of the job. Measurements shall be taken and verified at the project before any fabrication begins to ensure accurate dimensions.
- F. FIELD DIMENSIONS
 - 1. The woodwork manufacturer shall be responsible for details and dimensions controlled by job conditions and shall show on his shop drawings all required field measurements beyond his control. The general contractor and the woodwork manufacturer shall cooperate and maintain these field dimensions. Measurements shall be taken and verified at the job before any fabrication begins to ensure accurate dimensions.

II. PART 2 - PRODUCTS

2.1 WOOD CABINETS

- A. AWI quality grade for wood cabinets shall be custom grade.
- B. Details shall conform to Full Overlay Design.
- C. Exposed parts of wood cabinets shall comply with the following finish requirements:
 - 1. Wall Hung Cabinets
 - a. Tops and bottoms and sides shall be ¾" plywood with high pressure plastic laminate on the exterior and interior.
 - b. Back shall be ¼" plywood with high pressure plastic laminate finish.
 - c. Adjustable shelves shall be ¾" plywood with high pressure plastic laminate on all exposed surfaces with metal standards.
 - d. Door shall be ¾" particle board with high pressure plastic laminate on the edges, front and back. Balance of cabinets shall remain plywood.
 - e. Wall cabinets shall be lockable.

2. Base Cabinets
 - a. Base shall be $\frac{3}{4}$ " plywood with high pressure plastic laminate on all exposed surfaces except counter tops.
 - b. Countertops shall be $\frac{3}{4}$ " plywood roll formed, with high pressure plastic laminate top, and with high pressure plastic laminate balancing sheet
 - c. Back shall be $\frac{1}{4}$ " plywood with a high pressure plastic laminate finish.
 - d. Bottom shall be $\frac{3}{4}$ " plywood with a high pressure plastic laminate finish.
 - e. Drawer fronts shall be $\frac{3}{4}$ " particle board with high pressure plastic laminate front and edges. Balance of cabinets shall remain plywood. All interior surfaces of drawers shall be high pressure plastic laminate.
 - f. Drawer bottoms, sides and back shall be $\frac{1}{4}$ " plywood with a high pressure plastic laminate finish.
 - g. Shelves shall be $\frac{3}{4}$ " plywood with high pressure plastic laminate on all exposed surfaces.
 - h. Doors shall be $\frac{3}{4}$ " particle board with high pressure plastic laminate front, sides and back. Balance of cabinets shall remain plywood.
 - i. Frame of cabinet that touches concrete floor or concrete block walls shall be 2 x pressure treated.
 - j. Base cabinets shall be lockable.
3. Cabinet Hardware
 - a. Hinges shall be clip-top 110-120° full overlay, self closing European style hinges, all metal construction with nickel plated finish and 3-dimensional adjustment, by Blum, Stanley, EPCO or Grass.
 - b. Door and drawer pulls shall be dull chrome, wire type, 4" centers, Epco Chrome "MC 4023.5", or equal by Stanley or Blum.
 - c. Door bumpers shall be Blum Clear "TP150", or equal by Stanley or Epco.
 - d. Door latches shall be Stanley #SP46(AL), or equal by Epco or Blum.
 - e. Drawer slides shall be epoxy-coated, bottom-mounted 75 lb. min. load rating, Blum "BF 230M", or equal by Epco or Stanley. Alternate acceptable drawer slide shall be side-mounted 100 lb. min. load rating.
 - f. Cabinet locks (wall cabinets, base cabinets and drawers) - cylinder lock with master key capability, keyed alike within each room. Provide two keys per lock.
4. Cosmetology sliding door hardware shall be Knappe & Vogt as follows:
 - a. Double track #469, ZC surface mounted.
 - b. Upper T guide for ball bearing track #953 ZC, recessed $\frac{1}{4}$ ".
 - c. Ball bearing round groove sheave #430, STL, recessed.
 - d. Oval steel finger pull #813 ANO.

5. Cosmetology mirrors shall be custom fabricated double sided 24" wide x 42" high x 1/2" thick framed with 4-side outriggers to attach to cabinets. Acceptable fabricator shall be Robelan Displays, Inc. (516)-564-8600.
6. No melamine shall be used.

D. Accessories

1. Work Station Brackets

- a. Provide 1/8" steel brackets with almond powder coat finish, 18" x 24" with 3" x 3" 45° notch for wire way. See drawings for locations. Maximum spacing shall be 48" o.c. See AandMhardware.com

III. PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine surfaces designated to receive work described in this section for conditions adversely affecting the finished work. Repair or replace surfaces not meeting tolerances or quality requirements imposed by specifications governing substrate construction prior to initiating this work. Start no work until all wet trades have completed their work and it is cured and dry and minimum temperature for finished work is established and maintained.

3.2 WORKMANSHIP

- A. Use only highly skilled finish carpenters for installation of all work. All work shall be performed in accordance with referenced standards, thoroughly smoothed, sanded and prepared for finishing and shall be free from machine and toolmarks, abrasions, raised grain, slivers, etc. All millwork shall be struck clean and smooth in accordance with details and shall be bradded in quirks with all nails set for putty fill. Drill pilot holes for nails to prevent splitting. Joints shall be absolutely tight and all work shall be plumb, square, level and true.
- B. Cut work to fit unless specified to be shop-fabricated or shop-cut to exact size. Where architectural woodwork abuts other finished work, scribe and cut for accurate fit. Before making cut-outs drill pilot holes at corners.
- C. Distribute defects allowed in the quality grade specified to the best overall advantage when installing job assembled work.
- D. Items which cannot be manufactured in one piece shall have joints at logical breaking points and shall be noted on shop drawings.
- E. Work shall be straight, plumb, level and in true alignment. Fit all joints closely and fasten all pieces rigidly in place. Nails used for

finish work shall be countersunk and filled. Neatly match all joints and leave work clean and free from warp, twist, open joints and other defects. Provide protection until completion of the job.

- F. Coordinate work with installation work of other trades.

3.3 INSTALLATION

A. Furring

1. Fastenings of wood furring to concrete and CMU shall be of metal and of type and spacing best suited to conditions. Hardened steel nails, expansion screws, toggle bolts, self-clinching nails, metal plugs, inserts, or similar fastenings shall be used.
2. Wood furring shall be provided where necessary to obtain the required lines, contours, and levels in the finished surfaces of the work, and where shown in conjunction with other work.
3. Nailing or bearing strips on steel framing shall be securely fastened to the steel at points staggered and spaced approximately 30" on center.
4. Wood furring against concrete or CMU shall be pressure treated.
5. Secure cabinets to wall with anchors through blocking at maximum 8" o.c. horizontally and 16" o.c. vertically.
6. Provide solid blocking at stud walls.

B. Cabinets

1. Install cabinets in a manner consistent with the specified Quality Grade, plumb, level, true and straight without distortions. Shim as required using concealed shims. Accurately scribe all face plates, filler strips, trim strips, etc., closely to adjacent surfaces.
2. Secure cabinets to blocking with countersunk, concealed fasteners and blind nailing. Scribe and cut for accurate fit to other finished work.
3. All cabinets shall be assembled as indicated in as large as practical sections. Pieces shall be tongue and groove, dove-tailed or mortise and tenoned in accordance with referenced standards.
4. Joints between cabinet tops and backsplash/sidesplash shall be sealed with clear silicone sealant.
5. Backsplash/sidesplash shall be set in a full bed of sealant between top and splash during installation.

3.4 PROTECTION

- A. Protect finished and prefinished surfaces from work of other trades.
- B. Provide protection necessary for all millwork to prevent all forms of damage.

- C. Prior to date of substantial completion, examine work for damage. Remove and replace any damaged or defective architectural woodwork at no extra cost to Owner.

3.5 CLEANING AND ADJUSTING

- A. Clean wood, metal and accessory items using a neutral cleaner. Check and correct all mechanisms for proper operation. Adjust and lubricate hinges, catches and other operating hardware on cabinets.

END OF SECTION

SECTION 07 150

DAMPPROOFING

I. PART 1 - GENERAL

1.1 SCOPE

- A. Apply dampproofing to exterior face of concrete and CMU on above grade exterior walls behind new brick veneer.

1.2 SUBMITTALS

- A. Submit manufacturer's product specifications and installation instructions, including rates of application.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver dampproofing materials in manufacturer's unopened packaging with labels intact.
- B. Store materials in a dry place at least 6" off the ground.

1.4 QUALITY CRITERIA

- A. Must comply with ASTM D 1227-87, Type IV and Federal Specification SS-R-1781, Type I.

1.5 WARRANTY

- A. Warrant dampproofing work from defects in materials and workmanship for a period of one year beginning at date of substantial completion.

II. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acceptable products include the following:
 1. Koch Materials Company "Mulseal"
 2. Karnak Chemical Corp. "Emulsion Coating #100" non-fibrated, protective coating
 3. Sonneborn Division of Contech, Inc. "Hydrocide 700 B Semi Mastic"
 4. W. R. Meadows/Sealtight "Sealmastic"

III. PART 3 - EXECUTION**3.1 SURFACE PREPARATION**

- A. Prior to application of materials, remove dirt, grease, mortar droppings and other foreign matter from substrate.
- B. Apply dampproofing at temperatures above 40 degrees F to dry, cured surfaces.

3.2 APPLICATION

- A. Spray or brush apply two coats dampproofing in accordance with manufacturer's printed instructions. Observe minimum drying time between coats as specified.
- B. Protect adjacent finished surfaces from damage or staining from dampproofing by masking prior to application. Repair or replace surfaces damaged or stained by dampproofing.
- C. At completion of dampproofing operations, remove debris resulting from work, including spilled materials.

END OF SECTION

SECTION 07 190

VAPOR BARRIERS

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit manufacturer's product literature and installation instructions.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in manufacturer's original packaging or containers.
- B. Store to prevent damage, deterioration and contamination.

1.3 QUALITY CRITERIA

- A. ASTM E-1745-97, Class A
- B. ASTM E-154

1.4 WARRANTY

- A. Provide manufacturer's one year warranty.

II. PART 2 - PRODUCTS

2.1 VAPOR BARRIERS

- A. Product shall be 15 mil polyolefin film reinforced with resin fibers with tensile strength of 45 lb^f/in minimum and perm rating of .02.
- B. Acceptable below slab vapor retarder products shall include the following:
 - 1. "Moistop Ultra 15" - 15 mils minimum underslab vapor retarder as manufactured by Fortifiber Corporation.
 - 2. "Sure-Seal Butyl Sheet Membrane" underslab moisture vapor retarder as manufactured by Carlisle Syntec Systems.
 - 3. "Premolded membrane vapor seal" with plasmatic core as manufactured by W. R. Meadows, Inc.
 - 4. Equal product by W. R. Grace shall be subject to review.
 - 5. "Stego Wrap 15 mil" by Stego Industries.

2.2 TAPE

- A. Provide tape recommended by vapor retarder manufacturer for sealing joints in vapor barrier materials.

III. PART 3 - EXECUTION

3.1 BELOW SLAB VAPOR RETARDER INSTALLATION

- A. Install vapor retarder over compacted, clean sub-grade material, free of debris and protrusions which might damage vapor retarder.
- B. Lay vapor retarder over interior building areas to receive concrete slabs. Lap edges 6" and seal with tape over entire lap. Lay membrane with seams perpendicular to and lapping in direction of concrete pour. Turn edges of membrane up to within ½" of top of slab at intersection with vertical surfaces.
- C. Where expansion or control joints are indicated in slab, lay vapor retarder continuous under joint filler.
- D. Seal openings in vapor retarder around pipes and other protrusions with tape. Fold at corners to form envelope.
- E. Prevent damage to vapor retarder installation until concrete slab is in place.

END OF SECTION

SECTION 07 200

INSULATION

I. PART 1 - GENERAL

1.1 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials from moisture, soiling and breakage. Comply with manufacturer's printed recommendations for handling and storage.
- B. Store materials 6" off ground and under waterproof cover.

1.2 SUBMITTALS

- A. Submit manufacturer's product specifications and installation instructions for each type of insulation listed.
- B. Provide all insulation materials from one source whenever possible.

II. PART 2 - PRODUCTS

2.1 BATT INSULATION

- A. Batt insulation includes a 3-1/2" thick, R-13 unfaced, fiberglass batt material in rolls of a width to suit the spacing of framing members. Fiberglass insulation shall have a flame spread rating of 25 or less.
 - 1. Acceptable manufacturers shall be:
 - a. Schuller
 - b. Owens Corning
 - c. CertainTeed Corp.
 - d. USG Interiors.
- B. Firestopping insulation shall be 3-1/2" thick. Acceptable products include USG "Thermafiber" FS-15 blankets or approved equal by Schuller, Owens Corning, or CertainTeed. Fire stopping insulation shall be placed at all floor, ceiling and wall penetrations of fire-rated installations.
- C. Sound control blankets shall be mineral wool fiber blankets 3-1/2" or 6" thick at walls and 6" thick at ceilings. Acceptable products shall include U.S.G. "Thermafiber Sound Attenuation Fire Blankets" or approved equal by Schuller, Owens Corning, or CertainTeed. Install in all metal stud gypsum board partitions, in all toilet chases, and directly above lay-in acoustical ceiling tile panels in music rooms, administration, toilets and ceilings and as indicated on drawings.

2.2 RIGID ROOF INSULATION

- A. See Section 07 520 for insulation at Built-Up Roofing.

2.3 RIGID WALL INSULATION

A. Characteristics

1. Extruded polystyrene wall insulation shall have a minimum R-value of 5 per inch of thickness and maximum water vapor transmission of 0.6 per inch, conform to ASTM C578-92, Classification Type IV. Thickness of rigid insulation to be used in cavity shall be 1-1/2". Exterior polystyrene wall insulation shall be formed in boards 24 inches wide. Acceptable manufacturers shall include:
 - a. Dow Styrofoam "Square Edge"
 - b. Foamular "Square Edged 250" by Owens Corning.
 - c. Pactiv Building Products "greenguard"

2.4 EXTERIOR INSULATION FINISH SYSTEM

- A. Expanded polystyrene insulation to be used in EIFS installation shall be fully approved for use by Exterior Insulation and Finish System manufacturer and meet all printed requirements of that manufacturer. See Section 07 240 - Exterior Insulating Finish System. Thickness of expanded polystyrene shall be as indicated on architectural drawings. Minimum R-value of insulation shall be 5 per inch of thickness.

2.5 FASTENERS AND ADHESIVES

- A. Adhesives shall comply with printed recommendations of rigid insulation manufacturer.
- B. Staples shall be flattened and galvanized with a 7/16" minimum crown and a 1/2" minimum shank.

III. PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to installation ensure that:
 1. All preceding work to be concealed shall have been completed.
 2. Surfaces to receive insulation shall be dry, in uniform plane, and free of debris and projections which might damage insulation.
 3. Work which will conceal or protect insulation is ready for immediate installation.

3.2 BATTS

- A. Install at all exterior metal stud walls, gaps in rigid insulation, or as shown on drawings.
- B. Install batts without gaps over entire surface to be insulated.
- C. Do not block required ventilation.
- D. Install batts snugly between framing members, including small areas between closely spaced framing members.
- E. Carefully cut batts to fit snugly around penetrations.
- F. Where pipe or conduit run in the wall space, install batts between pipes, conduits, etc. and the exterior, compressing insulation as required.
- G. Install sound attenuation batts at all interior gypsum board/metal stud partitions and above ceiling at music rooms, administration areas, and as designated on drawing.

3.3 RIGID INSULATION

- A. Install rigid insulation without gaps over entire surface to be insulated.
- B. Secure rigid wall insulation with adhesives or mechanical fasteners as required by manufacturer's recommendations. Cut to lines as required for flashing installation. Fit insulation tightly around penetrations and pack remaining voids with batt insulation.
- C. Install rigid roof insulation according to manufacturer's recommendations. See Section 07 201.

3.4 PROTECTION OF MATERIAL FROM DAMPNESS

- A. At the time construction materials are received on site, they shall be inspected for dryness, and any material not completely free of dampness shall be rejected and replaced prior to being set into the building areas. If materials are to be stored on site prior to use in construction, they shall be stored on pallets, clearly and visibly off the ground and away from any ponding or puddling of ground water. The stored material shall further be completely protected from rain and other moist weather with plastic sheeting, which shall be adequately vented to avoid condensation build-up. Once built into the construction, even though the building may not be dried-in, the materials shall be protected from becoming wet by rain or other moist weather with plastic sheeting.

END OF SECTION

SECTION 07 240

EXTERIOR INSULATION AND FINISH SYSTEM (EIFS & EFS)

I. PART 1 - GENERAL

1.1 SCOPE

A. Related Work Specified Elsewhere

1. See Section 07 900 - Joint Sealers. Sealant System shall be approved by the EIFS manufacturer as compatible with the selected system.

B. Provide all labor, materials and equipment necessary to install the Class PB, Flexible Polymeric System. The system shall meet the physical, structural and fire test properties set forth by the Exterior Insulation Manufacturer's Association (EIMA) for Exterior Insulating Finish Systems (EIFS).

C. The EIFS System shall consist of the following components:

1. Expanded polystyrene insulation board field adhered and/or mechanically attached to a previously installed substrate
2. Woven or welded fiberglass mesh embedded in plastic veneer base over insulation board
3. Finish plastic coating with integral color and texture

D. EFS System shall consist of the following components:

1. Woven or welded fiberglass mesh embedded in plastic veneer base over high-impact gypsum board substrate.
2. Finish plastic coating with integral color and texture.

E. Installation shall conform with EIFS System manufacturer's current published typical details and specific recommendations for the project.

1.2 SUBMITTALS

A. Submit manufacturer's product specifications and installation instructions.

B. Submit color samples of all colors available for architect's review and selection.

C. The applicator shall submit evidence with the bid that he is a manufacturer-approved applicator of the system with whom the project has been bid.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in original, unopened packaging with legible manufacturer's identification and labels intact.
- B. Store products in a cool, dry place out of direct sunlight, protected from the elements and damage.
 - 1. Finish coating and adhesive shall be stored at a temperature of not less than 40 degrees F at all times.

1.4 PROJECT CONDITIONS

- A. Environmental Requirements
 - 1. Application of the system shall be in ambient temperatures above 40 degrees F and rising to unfrozen surfaces.
 - a. For installation in temperatures less than 40 degrees F supplementary heat shall be provided.
 - 2. A minimum ambient temperature of 40 degrees F shall be maintained for at least 24 hours prior to and following the system installation.
- B. Protection
 - 1. Protect surrounding areas and surfaces to preclude damage during application of the system.
 - 2. Protect finished work when stopping for the day or when completing an area in order to prevent water from penetrating the system.
- C. Coordination
 - 1. The work of this section requires close coordination between related trades.
 - 2. The tops of all walls must immediately be covered with either the final trim or temporary protection to prevent water infiltration behind the system. Coping shall be installed as soon as possible after the installation of the system.
 - 3. All joints to be sealed shall be done immediately after the installation of the system.

1.5 QUALITY CRITERIA

- A. Applicator
 - 1. Application of the system shall be by an applicator approved by the manufacturer.
 - 2. Applicator shall follow manufacturer's current printed application instructions.

B. Code Approvals

1. The proposed EIFS Systems are to comply with 2006 IBC Section 1404.11 and 1405.18 of 2007, 2008 and 2009 Georgia State Amendments.
 2. Proposed Exterior Insulated and Finish System (EIFS) shall be from a manufacturer with a current ICC Evaluation Report and shall be installed in accordance with the specific manufacturer's ICC evaluation report criteria and the manufacturer's installation and application instructions to provide the building with a weather-resistant exterior wall envelope.
- C. The performance of the EIFS and recommendation of the proper method of attachment of the system (adhered and/or mechanically fastened) shall be the sole responsibility of the EIFS manufacturer. The EIFS installer shall maintain compliance with the manufacturer's recommendations.

1.6 MAINTENANCE MATERIALS**A. Maintenance Kit**

1. Supply maintenance kit and store at site where directed by Architect.
 - a. Containers of liquids shall be unopened.
2. Maintenance kit shall contain the following components:
 - a. Printed maintenance instructions
 - b. One gallon of adhesive
 - c. One gallon of finish color coating for each color used
 - d. 20 square feet of each type reinforcing fabric
 - e. 20 square feet of insulation board

II. PART 2 - PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS****A. Acceptable manufacturer's shall include the following:**

1. Dryvit "Outsulation Plus"
2. Sto "Classic Next"
3. Equal by Senergy
4. Equal by Parex

2.2 ADHESIVE/LEVELER**A. Adhesive/leveler shall be a portland cement, type I based material w/co-polymer or plaster adhesive additives. Adhesive shall be compatible with the insulation board, substrate and reinforcing fabric. Acceptable products include:**

1. Dryvit Primus/Adhesive
2. Sto Dispersion Adhesive

3. Senergy Adhesive
4. Parex Adhesive

2.3 MECHANICAL FASTENERS

- A. Incorporate mechanical fasteners in the EIFS installation only if required by the EIFS manufacturer for a guaranteed installation.

2.4 SECONDARY AIR AND WEATHER BARRIER

- A. The secondary air and weather resistive barrier shall consist of the following components:
 1. Backstop NT Smooth - A 100% acrylic non-cementitious polymer product to be applied to exterior gypsum sheet products (sheathing and exterior ceiling board).
 2. Backstop NT Texture - A 100% acrylic non-cementitious polymer product to be applied to exterior cementitious substrates.
 3. Grid Tape - An open weave fiberglass mesh pressure sensitive tape. Flashing Tape - A high density polyethylene backed tape with rubberized asphalt adhesive.
 4. Tape Surface Conditioner - A water-based adhesion promoter.
- B. Drainage track to be applied at the base of all exterior wall surfaces with an EIFS finish shall consist of the following components:
 1. J Channel PVC perforated drainage track with weep holes (Four different products are available. Provide and install track(s) suitable for the applicable installations in compliance with recommendations from the EIFS manufacturer).
 2. AP Adhesive - A moisture cured urethane-based adhesive used to adhere drainage track and drainage strip.
- C. Urethane based adhesive used to adhere the drainage strip and drainage track to the substrate shall be "AP Adhesive" manufactured by Dryvit.
- D. Drainage track to be applied at the base of all EIFS exterior wall surfaces shall be UV treated PVC perforated J channel with weep holes manufactured in compliance with the requirements of ASTM D 1784 and ASTM C1063. Acceptable products shall include one of the following tracks suitable for the applicable installation:
 1. Starter Trac STWP without drip edge manufactured by Plastic Components, Inc.
 2. Starter Trac STDE with drip edge manufactured by Plastic Components, Inc.
 3. Universal Starter Track manufactured by Wind Lock Corporation.
 4. Sloped Starter Strip with drip manufactured by Vinyl Corporation.

- E. Drainage strip shall be a corrugated plastic sheet material to provide drainage. Acceptable products shall include "Drainage Strip" manufactured by Dryvit.
- F. Adhesive/base coats used to adhere insulation board to secondary weather and air resistive barrier and to embed reinforcing mesh over insulation board shall be an acrylic, polymer-based product field-mixed in a 1:1 ratio with Portland cement, equal to Dryvit "Primus."

2.5 INSULATION BOARD

- A. Insulation shall comply with the following guidelines and shall be certified by the manufacturer as an acceptable product.
 - 1. Expanded Polystyrene (EPS)
 - a. EPS shall comply with ASTM C578, Federal Specifications HH-I-524C Type (I or II) and tested in accordance with ASTM C578 or UL723, with a flame spread of less than 25 and smoke development of less than 450 as required by the applicable building codes. R value shall be 5 per inch of thickness. Minimum allowable density shall be 1.0 PCF in accordance with ASTM C177, thermal conductivity shall provide a K-factor of .24 at 40 degrees Fahrenheit and .26 at 75 degrees Fahrenheit.
 - b. Insulation board shall be aged. If air dried, insulation board shall be aged for not less than six weeks in block form prior to cutting and shipping. Other methods of aging shall be equivalent to six weeks aged (air dried) insulation board and certified as equivalent by insulation board manufacturer.
 - c. Variations in tolerances in dimensions of insulation board shall be minimized.
 - d. All insulation board shall be labeled on each package to provide information required by Applicable Codes.
 - e. Insulation board thickness shall be as noted on drawing. Maximum board size shall be 2' x 4'. Minimum thickness shall be ¾", unless joints are shown on drawings, whereas minimum thickness shall be 1-½". Additional thicknesses are shown on Drawings.
 - f. Acceptable products shall be Dow "Styrofoam" Square Edge, or approved equal by Foamular or Amoco Foam.

2.6 REINFORCING FABRIC

- A. The following products are manufactured by Dryvit Systems, Inc. Products of other manufacturers listed at 2.1 shall be subject to Architect's review. All products are treated, open weave, glass fiber,

two directional, woven/welded mesh which are compatible with all other components of the "Dryvit" EIFS System.

1. "Detail" reinforcing mesh
2. "Hi-Standard II" reinforcing mesh
3. "Intermediate" reinforcing mesh
4. "Panzer" reinforcing mesh

2.7 GROUND COAT

- A. Ground coat shall be portland cement, type I based or acrylic co-polymer based material.

2.8 FINISH COAT

- A. Finish coat shall be a synthetic plaster or acrylic based material premixed at the factory.
- B. Final Color Selection shall be by Owner. Basis of design shall be Dryvit #110 "VanDyke" for all exterior finishes.
- C. Basis of design texture shall be "Sandblast".

2.9 WATER

- A. Water shall be clean and potable. All water shall be tested by the installer for excessive levels of iron and all other potentially damaging substances prior to its incorporation in accordance with the manufacturer's written instructions.

2.10 SEALANT SYSTEM

- A. The finish system applicator shall be responsible for sealing all joints that include any portion of the exterior insulating finish system. See Specification Section 07 900. The following products shall be used unless the manufacturer recommends an alternate:
 1. Sealant shall be two part polyurethane sealant. See Section 07 900, Joint Sealers. Acceptable product shall be Tremco "Dymeric 511", or approved equal by Thoro Systems or Sonneborn.
 2. Primer shall be Tremco "Primer #1" or approved equal by Thoro Systems or Sonneborn. Ensure that primer is applied before the sealant at all locations.
 3. Provide backer rod and bond breaker tape.
- B. Provide sealant in colors to match adjacent EIFS, brick, hollow metal. Colors to be selected by Owner. Provide color chart samples for selection.

2.11 TWO PIECE REGLET AND FLASHING SYSTEM

- A. Provide at intersection between roofing membrane at EIFS or EFS Systems, between brick veneer and roofing membranes.
- B. Acceptable manufacturer FRY Springlok, Type ST or STX stucco reglet or approved equal product by MM Systems Corp or W.P. Hickman Co. See drawings for locations.

III. PART 3 - EXECUTION

3.1 SAMPLE WALL PANEL

- A. Construct a 6'-0" long by 4'-0" high sample wall panel (including a corner, one control joint, one expansion joint and all colors) of EIFS, which includes an "intermediate mesh" base coat. Locate panel as directed by Architect. Panel may be a portion of the permanent construction. Erect beside brick sample panel showing typ. Joint between brick and EIFS.
- B. Indicate the following qualities to be expected on the project:
 - 1. Texture
 - 2. Color
 - 3. Joint tooling
 - 4. Workmanship
 - 5. Reinforcing mesh
- C. Prepare panel at least 14 days prior to beginning system work. Should panel be rejected, prepare additional panels until architects review indicates compliance with requirements. Do not proceed with work until sample panel has been reviewed by architect.
- D. Maintain panel throughout project as standard of quality. Do not destroy panel until directed by Architect.

3.2 INSPECTION

- A. Examine surfaces to receive the system for:
 - 1. Substrates contrary to manufacturer's recommendations
 - 2. Defects or coatings on the substrate that will adversely affect the execution and quality of work
 - 1.) The substrate shall be sound, free of hot spots, releasing agents (silicones, oils, etc.) and other residue.
 - 2. Deviations beyond allowable tolerances for installation of substrates material
 - a. The substrate shall have no planar irregularities greater than ¼ inch in any dimension.
- B. Do not start work until unsatisfactory conditions are corrected.

3.3 PREPARATION

- A. Clean substrate surfaces to receive insulation application in accordance with requirements of Section 04 220 -Concrete Unit Masonry.
- B. Protect all adjacent surfaces and materials including window and door frames, glass, glazing, etc. from system residue.

3.4 MIXING

- A. Adhesive, Leveler and Ground Coat
 - 1. Use clean container, free of all foreign substances, for mixing and preparing material. Do not use container which has been used for or cleaned with a petroleum product.
 - 2. Use a mixer, powered by ½ inch drill 400-500 RPM.
 - a. After mixing, clean mixer immediately with water.
 - 3. Stir before adding portland cement to assure homogeneous material.
 - 4. Mix Type I portland cement with adhesive in a ratio of one part Portland cement to one part adhesive.
 - a. Measure quantities of adhesive and portland cement separately before mix.
 - b. Add portland cement to adhesive in small increments while thoroughly mixing each increment.
 - 5. Keep container closed when not in use.
 - 6. No additives such as rapid binders, anti-freeze, accelerators, etc., shall be added to any material under any circumstances.
- B. Finish
 - 1. Thoroughly mix the factory-prepared finish material with the high speed mixer until a uniform workable consistency is attained.
 - a. A small (less than 2% of total mixture volume) amount of clean potable water may be added to adjust workability.

3.5 APPLICATION OF SECONDARY AIR AND WEATHER BARRIER

- A. The secondary air/weather barrier shall be applied to all exterior gypsum sheet substrate surfaces (exterior gypsum sheathing and exterior gypsum ceiling board), and all exterior cementitious substrates (concrete and CMU) which will receive EIFS in strict compliance with the manufacturer's recommendations. The secondary air/weather barrier shall not be applied to exposed first floor concrete slab edges.

- B. Apply grid tape over sheathing joints, inside and outside sheathing corners and exposed edges at sheathing terminations. Apply only an amount of grid tape which can be covered with Backstop NT in the same day.
- C. All exposed fastener heads and sheathing joints shall be treated with an additional application of Backstop NT and grid tape prior to application of Backstop NT Smooth. Roll or spray-apply Backstop NT Smooth over all exterior gypsum sheathing and exterior gypsum ceiling board substrates in a uniform continuous film at the coverage rate recommended by the product manufacturer.
- D. Roll or spray-apply Backstop NT Texture over all exterior CMU and concrete substrates in a uniform continuous film at the coverage rate recommended by the product manufacturer.
- E. Prime all surfaces to receive Flashing Tape prior to application with Dryvit Flashing Tape Surface Conditioner with a brush or roller at an application rate recommended by the manufacturer. Surface conditioner shall cure completely prior to application of Flashing Tape. Only apply as much surface conditioner which can be covered with Flashing Tape in the same day. Warm surfaces with a heat gun prior to application if recommended by the manufacturer.
- F. Apply Dryvit Flashing Tape at discontinuities and terminations such as wall openings, expansion joints and tops of walls in strict compliance with the application procedures defined in applicable details of Dryvit Publication DS110. Cut Flashing Tape to the necessary lengths, peel release paper and position it so it overlaps the Backstop NT 2" and the remainder is turned into the wall opening. Avoiding fishmouths and wrinkles, apply pressure to firmly seat the Flashing Tape. Roll over Flashing Tape with a hand roller to ensure continuous bond. Sill / Jamb and Head / Jamb applications of Flashing Tape shall be addressed specifically as required by the manufacturer.
- G. Drainage Track shall be applied at the base of all walls with an EIFS finish. Adhere Drainage Track to substrates with AP Adhesive. Butt adjacent track sections rather than overlapping. Secure the Drainage Track to the substrate using corrosion resistant fasteners. Center Grid Tape over the Drainage Track flange / substrate interface and apply Backstop NT over the grid tape to provide a continuous film.

3.6 EIFS AND EFS APPLICATION

- A. Application methods shall be the following:
 - 1. Where "Exterior Insulation Finish System" (EIFS) is indicated on the drawings, the installation shall include the application

- of rigid insulation as a substrate for the exterior finish system.
2. Where "Exterior Finish System" (EFS) is indicated on the drawings or specs, the installation shall not include the application of rigid insulation, but shall include a reinforcing fabric in the system.
- B. Expanded polystyrene insulation as described in Section 07 200 - Insulation and part 2.03 of this section shall be attached as follows:
1. General
 - a. Insulation shall be applied to the substrate surface starting from the bottom and shall be supported by permanent or temporary means.
 - b. Insulation shall be applied with the long edge oriented horizontally, with its joints offset with respect to the substrate joints using a running bond pattern.
 - c. Insulation shall be precut to fit openings, corners and projections prior to application of the adhesive mixture.
 - d. Joints shall be staggered and interlocked at corners.
 - e. Pieces smaller than 2' x 4' may be used, such as at corners, etc. In all cases, the perimeter of the insulation board shall have the 2" ribbon per the ribbon and dab method and 32% minimum contact area shall be maintained.
 2. Adhesive Mixture
 - a. Adhesives shall be applied with the ribbon and dab method.
 - 1.) Ribbons of adhesive mixture shall be applied with a trowel to one surface of the insulation board.
 - 2.) The ribbons shall be 2" wide x $\frac{3}{8}$ " thick around the entire perimeter of the insulation board.
 - 3.) The adhesive mixture shall not be applied to the ends of the insulation board.
 - 4.) Eight dabs of adhesive mixture 4" in diameter x $\frac{3}{8}$ " thick shall be applied to the area within the perimeter ribbon.
 - 5.) A minimum of 32% of the insulation board surface shall be in contact with the adhesive mixture.
 - 6.) At intersections of dissimilar materials, apply adhesive only as indicated on the drawings, to ensure proper movement of the insulation board.
 3. The prepared insulation board shall be immediately taken to the Substrate and applied as follows:
 - a. The insulation board shall be lightly affixed to the substrate with the lower horizontal edge and adjacent vertical edge $\frac{1}{2}$ " from the adjacent insulation boards.
 - b. The insulation board shall be pressed down and slid diagonally until it tightly abuts the edges of the adjacent insulation boards.

- c. The entire outside surface of the insulation board shall be tamped with even pressure to ensure complete contact of the adhesive mixture to the substrate and squareness with the adjacent insulation boards. A straight edge at least 6' long shall be used for this purpose.
 4. If gaps in the insulation board occur, slivers of insulation board shall be cut and shaped to fit the gaps and inserted, without using the adhesive mixture.
 5. A period of 24 hours shall elapse to allow the adhesive mixture to form a positive bond. The insulation board shall not be moved nor the substrate flexed while the adhesive mixture is curing.
 6. The edges of the insulation board and all other surfaces which are out of plane shall be sanded until flush. Low areas shall not be filled with adhesive mixture to produce a level surface.
 7. Grooves and other features shall be routed into the outside surface of the insulation board, if required, using a high-speed wood router and proper bit. The minimum thickness of the insulation board at any point in the routed groove or feature shall not be less than $\frac{3}{4}$ ".
- C. Ground coat and reinforcing fabric shall be applied as follows:
 1. Prior to installation of ground coat, remove all yellow dust deposits resulting from excessive UV exposure.
 2. Using a stainless steel trowel, apply mixed ground coat to the entire surface on the insulation board to a uniform thickness of approximately 1/16 inch.
 3. Immediately place the reinforcing fabric against the wet ground coating, and, by troweling from the center to the edges, embed the fabric into the coating.
 - a. Reinforcing fabric shall be continuous at corners and lapped not less than 2-1/2 inches at fabric edges.
 - b. Avoid wrinkles when embedding the reinforcing fabric.
 - c. Coating shall be such that the reinforcing fabric is fully embedded.
 - d. "Detail" mesh shall be incorporated on all EIFS surfaces with reveals, complex contours, recesses, etc. It shall be installed in one layer.
 - e. "Hi-Standard II" mesh shall be installed on all EIFS surfaces subject to normal impact damage potential, including typical flat exterior wall surfaces above 8'-0" above finished adjacent grade. It shall be installed in one layer.
 - f. "Panzer" mesh shall be incorporated in EIFS installations subject to maximum impact damage potential, including all EIFS surfaces within 8'-0" of adjacent finished grade or as indicated on drawings. Following the installation of a single layer of "Panzer" mesh, a layer of "Hi-Standard II" shall be applied.

Provide and install "Panzer Corners" at all outside corners, including corner of fascia and soffit at all corridor exits.

- g. A 2" wide x 8" long strip of mesh shall be installed diagonally at a 45 degree angle at the corners of all openings.
4. The ground coating surface shall be dry and hard before proceeding to finish application.

D. Finish shall be applied as follows:

1. Using a clean stainless steel trowel, apply a light coat of the finish to the minimum attainable thickness consistent with uniform coverage.
 - a. It shall be applied and leveled during the same operation to the minimum attainable thickness consistent with uniform coverage.
 - 1.) Finish must be applied and textured continually over a wall surface.
 - 2.) Work to corners or joints and do not allow the material to set up within a distinct wall area.
2. The final texture shall be achieved after the finish has gelled so that it does not stick to the trowel.
3. The final thickness shall not be greater than the diameter of the largest aggregate of the finish material.
4. Colors of adjacent EIFS panels shall match one another to the Owner's satisfaction. If colors do not match, EIFS installer shall re-apply finish coat as required to attain Owner's approval.
5. Any scaffolding used to install EIFS shall be incorporated in such a fashion that a shadow from sunlight is not cast over a wet finish coat. Finish coat application shall be scheduled so that there is no direct sunlight on the section of the building where the scaffolding is constructed. The purpose of this requirement is to prevent engraved shadow lines in the finish coat.

3.7 CLEAN-UP

- A. Remove all construction debris and residue from project site daily.
- B. Clean all residue from glass, glazing, aluminum, etc. as recommended by manufacturer resulting from Exterior Insulation Finish System work.

3.8 PATCHING

- A. Any damage that might occur to the system during installation or cleaning shall be repaired or replaced by the applicator in accordance with the manufacturer's written recommendations.

END OF SECTION

SECTION 07 520

FOUR-PLY BUILT-UP ROOFING

I. PART 1 - GENERAL

1.1 SCOPE

- A. The roofing system required under this section consists of application of a four-ply gravel surface built-up roof over flat and tapered rigid perlite insulation adhered to rigid polyisocyanurate insulation which is mechanically attached paper to existing metal deck substrate. All applications shall be in compliance with the requirements of a Factory Mutual Class 1 (I-60) insulated deck. All products and systems used shall comply with the requirements for Underwriters Laboratories Class A fire hazard classification.
- B. Scope includes removal of existing roofing system, insulation, flashing and sheet metal.
- C. See drawings for replacement of nailers.

1.2 SUBMITTALS

- A. Submit shop drawings which include the following information:
 - 1. Architect's project number
 - 2. Manufacturer's technical product data for all products proposed for installation
 - 3. Project title
 - 4. General Contractor's signed and dated approval stamp
 - 5. Reference to specification sections and other construction documents
 - 6. Location of the work addressed with the shop drawing
 - 7. Any qualifications, deviations or departures from the Contract Documents shall be noted
 - 8. Any additional information required by the Specifications for submitted products and systems.
- B. All associated shop drawings and submittals relating to complete roofing system assembly shall be submitted at the same time so that each may be checked in relation to the entire assembly. Piecemeal submittals shall not be accepted.
- C. Shop drawings and installation layout shall be prepared which depict the proposed solutions for field conditions concerning two or more trades relating to the roofing installation. Composite shop drawings and field installation layout shall be coordinated in the field by the General Contractor for proper relationships to the work of the trades involved.

- D. Submit manufacturer's illustrated cut sheets of the products to be furnished showing details, sizes, dimensions and all other pertinent information.
- E. Submit manufacturer's complete description of the roofing system listing all components.
- F. Submit manufacturer's technical specifications and installation procedures for each roofing component.
- G. Submit a copy of the roofing system manufacturer's safety data sheets.
- H. Submit the following certificates from the roofing system manufacturer:
 - 1. Submit separate letters from the roofing system manufacturer and the insulation manufacturer stating that they have examined the construction documents and approve the use of their products and systems for this project.
 - 2. Submit a letter from the roofing system manufacturer acknowledging compatibility with and approving use of the roofing accessories with the proposed insulation.
 - 3. Submit a letter from the insulation manufacturer acknowledging compatibility with and approving use of the insulation with the proposed roofing system and accessories.
 - 4. Submit a copy of the Agreement issued by the roofing system manufacturer indicating that the proposed installer has been approved for this project.
 - 5. Submit a letter from the roofing system manufacturer clearly identifying components which are not packaged by the manufacturer and acknowledging approval to use those components for this project.
 - 6. Submit for each bulk shipment of asphalt a manufacturer's certificate clearly indicating the type of asphalt and compliance with referenced standards.
 - 7. All manufacturer's certificates submitted shall be signed by an authorized officer of the product manufacturer and notarized.
 - 8. Roofing installer shall furnish an affidavit from the roofing material manufacturer certifying that the installer has satisfactorily applied the type of roof specified on at least three projects similar in magnitude which have been completed during the last five year period.
 - 9. Submit a letter executed by the authorized representative of the roof system manufacturer indicating that he has inspected the roof prior to and after flood coat and gravel and approves all work completed.

1.3 DELIVERY, STORAGE AND HANDLING

- A. All project components shall be delivered to the site in the manufacturer's original, unopened containers and wraps, dry, undamaged with labels and seals intact.

B. Storage

1. Store moisture absorbent materials in a dry, covered or enclosed storage location 6" off the ground.
2. Store roofing felts by standing rolls on end and covering with water repellent covers.
3. Insulation shall not be stacked over a height as recommended by the insulation manufacturer.
4. All materials shall be placed on pallets above grade and shall be covered with waterproof covers to maintain in a dry condition. Manufacturer's packaging wrappers are not acceptable as waterproof protection. Neither wet nor damp material shall be used in built-up roofing assemblies. Wet material shall be removed from the project site.
5. Store bituminous materials at temperatures above 40 degrees F and below 100 degrees F.

1.4 PROJECT CONDITIONS

- A. Roofing installation shall take place only in dry weather and when temperature is above 45 degrees F unless prior written approval has been received from the Owner and the Architect. Asphaltic bitumen shall not be applied when ambient air temperature is expected to fall below 32 degrees F within a 24 hour period of their application.
- B. Do not apply roofing felts or insulation to damp or frozen deck surfaces.
- C. The building shall be maintained in a weathertight condition throughout all phases of the roofing installation. The installed portion of the roofing system shall be completely weathertight at the end of each working day.
- D. All work in place shall be protected at the time the roofing operations take place. Provide and maintain protection required to prevent masonry and other finish work from being damaged. General Contractor shall be responsible for all costs incurred in repairing, replacing and cleaning operations which may be required due to damage caused by roofing installation.
- E. Asphalt bitumens and kettles and handling equipment shall be maintained within the following ranges at all times during application:

Bitumen Temp. Deg. F. Mop Cart/Spreader Temp.

Type III 500 max. 400 - 425

Asphalt

Type IV 500 max. 400 - 450

Asphalt

At point of application the equiviscous temperature shall be maintained ± 25 degrees F. The kettle temperature shall be maintained below the

flash point of the asphaltic bitumen contained therein at all times. Kettle temperature shall not be kept at or above the boiling temperatures of the bitumen for more than 2 hours. Kettles shall have accurate working thermometers or kettle operator shall use a manual thermometer to check bitumen temperature at the farthest point from the burners or at the draw-off spigot.

- F. General Contractor shall notify the Owner and the occupied school two (2) weeks prior to start of roofing operation and coordinate schedule with school activities. Special care shall be exercised to minimize fumes to existing building.

1.5 QUALITY CRITERIA

- A. Roofing installation shall comply with Underwriters Laboratories Class A fire hazard classification.
- B. Roofing installation shall comply with Factory Mutual Roof Assembly Class I in compliance with Factory Mutual Construction Bulletin 1-27 for I-60 Uplift Construction.
- C. All roofing materials, with the exception of the aggregate surfacing and perlite insulation products, shall be provided by the same manufacturer. Roofing products of different manufacturers shall not be combined without written approval from the Architect, the Owner and the roofing system manufacturer which will provide the warranty.
- D. Any details or specified requirements which, in the opinion of the roofing system manufacturer, may impair the life, serviceability or intended function of the roofing system, shall be brought to the attention of the Architect immediately with written notification. Work relating to such specified or detailed requirements shall not proceed until conditions are resolved.
- E. The General Contractor shall observe the condition of the substrate to which the roofing system is to be applied and shall record the physical condition of the substrate on a daily basis for the owner's review.
- F. Roofing products shall comply with the following referenced standards:
 - 1. ASTM C728-97 Perlite insulation board.
 - 2. ASTM D41-94 Asphalt based liquid primer.
 - 3. ASTM D312-00 (Types I-IV) Roofing asphalts.
 - 4. ASTM D1863-03 Mineral aggregate surfacing.
 - 5. ASTM D2178-97a Inorganic fiberglass felt.
 - 6. ASTM D2626-86 Asphalt-saturated and organic coated felt base sheet.
 - 7. ASTM D4586-00 Asphalt base plastic cement.
 - 8. ASTM C1289-98, Grade 2 Polyisocyanurate insulation board.
 - 9. FS SS-R-620B (Type III) Inorganic fiberglass felt.
 - 10. ASTM D6164-00, SBS Modified Bitumen Sheet using Polyester Reinforcement.

- G. The Owner may elect to have test cuts taken, samples procured and laboratory tests performed related to the roofing system installation. If the roofing tests yield satisfactory results, all costs of cuts, samples, laboratory work and patching shall be borne by the Owner. In the event that tests reveal workmanship or materials which do not comply with the requirements of the contract documents, all costs related to the testing, the removal of the unsatisfactory roofing and the replacement thereof shall be borne by the Contractor.
- H. An inspection of the 4 felt plies shall be performed by the Owner and the roofing consultant prior to the application of the flood coat and aggregate surfacing.

1.6 PRE-ROOFING CONFERENCE

- A. Prior to beginning roofing installations, a meeting shall be conducted at the project site to review the specified and detailed roofing requirements. Installation procedures and coordination required with related work shall be discussed. The General Contractor shall advise the Owner and other invited parties of the meeting time a minimum of three days in advance. The meeting shall be attended by, but not limited to, the following persons:
 - 1. Owner's representative
 - 2. Roofing system installer
 - 3. Roofing subcontractor
 - 4. Roofing subcontractor's foreman who will be on this job
 - 5. Roofing system manufacturer's representative
 - 6. General Contractor's project manager
 - 7. General Contractor's project superintendent
 - 8. Architect
 - 9. Roofing Consultant

1.7 WARRANTY

- A. A roofing consultant shall be employed by the Architect to be present on a minimum of four hours per day during the entire roofing operation to supervise all work. Contractor must coordinate all work and scheduling with the roofing consultant.
- B. General Contractor shall provide a guarantee that work performed specified herein shall be in compliance with the requirements of the contract documents, shall be in compliance with Master Roofing and Sheet Metal Contractors Association of Atlanta, Inc., and shall be free from faults and defects in materials and workmanship for a period of two years beginning at the date of substantial completion. Warranty shall be countersigned by the roofing installer. Defects which occur during the specified warranty period shall be promptly corrected at no additional cost to the Owner following written notification by the Owner to the General Contractor.

- C. All guarantees shall be provided to the Owner prior to issuance of final payment to the General Contractor. Sample guarantees shall be submitted for Architect's review.
- D. Roofer shall certify that no asbestos material has been used.

II. PART 2 - PRODUCTS

2.1 ACCEPTABLE SYSTEMS

- A. Acceptable four-ply mineral surface built-up roofing systems shall include the following gravel surface, 400 #/SQ:
 - 1. Certaineed Corp. Glass and Asphalt Ply Sheet Membrane System, Specification No. "G-C-B4", non-nailable, four-ply system.
 - 2. Johns-Manville Roofing Systems Division, four-ply Gravel surface Fiberglass Built-Up Roof, Specification No. "4GIG"
 - 3. Tamko Asphalt Products, Inc., four-ply "603 Tam-Ply IV" gravel surfaced.
 - 4. GAF "IB-4G", four-ply system.
 - 5. Firestone I4FG four-ply system.
- B. Roofing system manufacturer shall have a local Atlanta-area representative and shall provide all specified materials for a bonded roofing system with the exception of the perlite insulation and aggregate surfacing.
- C. All products, including aggregate surfacing and perlite insulation, shall be covered by the roofing bond and all products shall be subject to the Architect's review.

2.2 SHEET MATERIALS

- A. Base flashing shall be polymer modified bitumen, reinforced flashing felt, with white granular surface, designed for hot mop asphalt application. Acceptable products shall include the following:
 - 1. Certaineed "Celopal Mineral Surface Cap Sheet"
 - 2. Johns-Manville "Dynaflex"
 - 3. Tamko Asphalt Products, Inc. "Versaflash 160"
 - 4. GAF "GAF Glas Flashing"
 - 5. Firestone
- B. Membrane flashing shall be a 20 mil thick, non-reinforced, homogeneous vinyl sheet product with 1,800 psi minimum tensile strength and 250% maximum elongation. Acceptable products shall include the following:
 - 1. B.F. Goodrich "BFG Vinyl Water Barrier"
 - 2. Sonneborn PVC "Hydrocide Vinyl Seal"
 - 3. Firestone "Rubberguard"

- C. Fiberglass plysheets shall be manufactured using a heavy duty fiberglass mat impregnated with asphalt, dusted lightly on the top side and marked with eight application lines. Rolls shall be 36" wide and product shall comply with ASTM D2178-97a Type IV. Acceptable products shall include the following:
1. Certainteed Corp. "Celo-glass AGS" Plysheet
 2. Johns-Manville "Glasply Premier"
 3. Tamko Asphalt Products, Inc. "Tam-Glass Premium"
 4. GAF "GAF glas Ply 4"
 5. Firestone

2.3 BITUMINOUS MATERIALS

- A. All asphaltic bitumen shall comply with ASTM D-312-00. The following asphalt applications shall be performed:
1. For adhesion of perlite insulation to polyisocyanurate insulation, Type III asphalt shall be used.
 2. For adhesion of fiberglass felts to one another, Type III asphalt shall be used.
 3. Top flood coat shall be performed with Type III asphalt.
 4. Base flashing may be adhered using Type IV asphalt at temperatures below 45 degrees F with the written permission of the Owner and the Architect. Otherwise, plastic asphalt based roof cement shall be used.
- B. Asphalt base liquid primer for metal, concrete and masonry surfaces, which conforms to ASTM D-41-94 shall be:
1. Certainteed "Asphalt Primer"
 2. Similar products by Johns-Manville, Tamko, GAF, Firestone
- C. Plastic asphalt base roof cement shall comply with ASTM D-4586-00. Acceptable products shall include the following:
1. Certainteed "Elastigum Roofer's Cement"
 2. Similar products by Johns-Manville, Tamko, GAF, Firestone
- D. Aggregate surfacing material shall be No. 7 Washed Granite applied at a rate of 400 lbs. per square with no more than 2% moisture content by weight in compliance with ASTM D1863-03. All aggregate surfacing shall pass a 3/4" screen and none shall pass a 1/4" screen.

2.4 INSULATION

- A. Flat, polyisocyanurate roof insulation shall be 2.5" thick, with an R factor of 15.3, furnished in 4'-0" x 8'-0" boards with asphalt saturated

felt facing sheets on both sides designed to receive bitumen mopping, laminated to foam core. Acceptable products shall include the following:

1. Certainteed Corp. "Hy-Therm AP"
 2. Johns-Manville "E'nerg'y 2"
 3. GAF "Isotherm R"
 4. Tamko
 5. Firestone
- B. Flat perlite roof insulation shall be 1" thick with an R factor of 2.78, furnished in 4'-0" boards, surface treated for enhanced asphalt bond. Acceptable products shall include the following:
1. Certainteed Corp. "Celo-Therm"
 2. International Permalite, Inc. "Permalite Sealskin"
 3. Manville "Fesco Board"
 4. GAF "GAF Temp Perlite"
 5. Firestone
- C. Tapered monolithic perlite roof insulation shall be a minimum of 1/2" thick and shall be furnished in 2'-0" x 4'-0" boards, surface treated for enhanced asphalt bond. All tapered components shall provide 1/4" per foot smooth slope. Acceptable products shall include the following:
1. Certainteed "Hy Therm" tapered roof insulation.
 2. Johns-Manville Roofing Systems "Tapered Fesco Board"
 3. Similar products by GAF, Tamko and Firestone.

2.5 MISCELLANEOUS ROOFING COMPONENTS

- A. Cant strips shall be mineral Perlite or wood fiber triangular shape, with a face dimension of not less than 5" and a total thickness of not less than 2".
- B. Acceptable mechanical fasteners used to attach polyisocyanurate insulation to steel roof deck with a minimum penetration through the deck of 3/4" shall be No. 12 fasteners with hex plates.
- C. Existing wood blocking shall remain unless required for new equipment. Examine existing nailers and notify Architect if replacement is advised using No. 2 common southern yellow pine, kiln-dried after treatment to a moisture content of not less than 19%. They shall be sound, thoroughly seasoned, dressed to nominal finish dimensions and free of warpage, cupping and bowing. All nailers and other blocking associated with roofing installation shall be pressure treated with 0.25 pcf retention of chromated copper arsenate (CCA Type C) and shall conform to AWPA Standard C2 for above ground contact. AWPA quality marks LP-2 shall be visible on each piece of lumber.

- D. Add 5/8" CDX plywood on 1 x 2 P.T. Nailer over existing wood nailer at all parapets on 1992 building addition.
- E. Roofing nails shall be galvanized or non-ferrous, flat head, barbed in a size required to suit application and penetrate substrate minimum of 3/4". Provide tin disks where specified.
- F. Custom fabricated curbs for roof mounted equipment shall be accurately sized to include all flashing and felts. Undersized and oversized curbs shall be rejected and replaced.
- G. Provide molded plastic splash blocks at all roof to roof downspouts.
- H. Sheet metal expansion joints shall be per SMACNA Manual.
- I. Provide red rosin paper against existing cementitious wood fiber roof deck at patches to original building.

2.6 SHEET METAL WORK

- A. Gravel-Stop Fascia: .050 galvanized steel with Kynar 500 coatings.
- B. Sheet Lead: 4 lb. Sheet lead for re-flashing vents and around roof drains. Flanges for soil pipe vents shall have minimum dimensions of 24" x 24".
- C. Bonnet Flashings: 24 gauge galvanized steel.
- D. Fasteners: Non-staining types as recommended by the manufacturer of the different materials used.
- E. Joint materials: G. E., Tremco or Dow-Corning Silicone Rubber Sealants.
- F. Solder: ASTM D32-66T with 50% lead and 50% tin unless otherwise specified. Follow manufacturer's recommended soldering procedures.
- G. See Specification Section 07 600.

III. PART 3 - EXECUTION

3.1 INSPECTION

- A. Roofing installation shall not begin until all vents, drains, curbs, cants, blocking and projections through the steel deck have been installed. All soil vent pipes shall terminate a minimum of 8" above the finished roof surface.
- B. All metal, masonry and concrete surfaces to which asphaltic bitumens or plastic asphalt base roof cement are to be applied shall be primed with asphalt based liquid primer at a rate of approximately 1 gallon per 100 square feet of surface area. Primer shall be allowed to dry in

accordance with manufacturer's written recommendations prior to applications of bituminous and cementitious materials.

- C. Prior to the installation or application of any roofing system components, all substrates shall be cleaned of all foreign matter which may impair the performance of the roofing system. No moisture in any form shall be present in or on any of the roofing products or substrates prior to or during roofing system installation.
- D. Provide and install minimum nominal 6" wide, continuous pressure treated wood blocking at all roof edges and openings in the thickness required for top of blocking to be flush with top of insulation. Blocking shall also be installed under roof-mounted equipment curbs in the thickness required to maintain the full depth of the cant face and a minimum flashing height of 8" above the finished roof surface.
- E. Roofing consultant shall inspect for compliance with drawings, specifications and manufacturer's recommendations prior to and during all phases of construction.

3.2 ROOF INSULATION INSTALLATION

- A. Following confirmation by the roofing installer that the steel deck substrate is acceptable, a single layer of 2.5" thick polyisocyanurate rigid insulation shall be mechanically attached to the deck. One fastener shall be installed for each 4 square feet of surface area of insulation boards. Fastener pattern shall be in accordance with Factory Mutual Class 1, I-60 requirements.
- B. All insulation boards shall be applied with end joints staggered approximately one half the length of the boards. Boards shall be installed tightly to one another and all adjacent vertical surfaces. All rigid insulation panel joints parallel to bearing surfaces shall occur over the bearing surface to provide adequate support for panel edges.
- C. Over flat polyisocyanurate, install a single layer of 1" thick perlite rigid insulation boards with vertical joints staggered between the layers. Perlite shall be installed over polyisocyanurate in a mopping of Type III asphalt bitumen using not less than 30 lbs. of bitumen per 100 S.F. of roof surface.
- D. Following installation of a layer of 1" thick perlite insulation over the complete surface area form crickets using factory tapered perlite insulation mopped over flat perlite insulation using Type III asphalt at a rate of not less than 30 lbs. per 100 S.F. of roof surface area. Provide a minimum insulation slope in valleys of 1/4" per linear foot. Provide crickets at all roof equipment and as shown on drawings with minimum slope of 1/2" per foot.
- E. Begin tapered perlite insulation system at drains and increase tapered insulation thickness toward adjacent roofing high point. Provide a

minimum tapered perlite insulation thickness at roof drains 1/2" above the 2.5" thick flat isocyanurate insulation.

- F. Install wood fibrous cants at all locations where roofing condition changes from horizontal to vertical. Set wood fiber cants in a continuous bed of hot Type III asphalt on both the vertical and horizontal surfaces.
- G. No more rigid insulation shall be applied than can be covered with built-up roofing on the same day. Exposed insulation edges at the end of each workday shall be temporarily sealed with a mopped in place roofing system tie off by applying a 5 course seal over four-ply roofing felts. Tie off shall be removed when the work is resumed on the following day. Insulation layers at tie offs shall be staggered in order to minimize a continuous vertical joint when work is resumed.

3.3 ROOFING FELT APPLICATIONS

- A. Beginning at the low point of the roof, embed four plies of fiberglass felts in uniform moppings of Type III asphalt at a rate of 25 lbs. per ply per square in a shingle fashion without voids between plies. Starting strips cut 9", 18" and 27" wide shall be installed beginning at the low point to be followed by full-width plies. Each sheet shall be lapped 27 1/2" over the preceding sheet. All plies shall be lightly broomed into place with a 36" wide broom while the mopping asphalt is still fluid enough to act as an adhesive. In no cases shall felt ever touch felt, or asphalt be displaced.
- B. Asphalt shall extend beyond the edge of each lap a minimum of 1/2". Exposure of asphalt along the edges shall be minimized in accordance with the manufacturer's written recommendations and roofing felts shall be kept within a 6'-0" distance of the hot mopping asphalt.
- C. Whenever possible, complete rolls of roofing felt shall be applied in a continuous manner. If rolls are allowed to set while partially unrolled, they shall be rolled back sufficiently to expose the area where the rolling stops so that the asphalt may be applied to that area.
- D. Extend roofing plies up faces of cants and cut off evenly at wall line approximately 2" above the top of all cants.
- E. At all roof edges and openings, felts at the outer edge of the deck or the blocking shall be terminated over the outermost face of the blocking.
- F. Over entire roofing surface, apply uniform flood coat of Type III asphalt at a rate of 65 lbs. per square and immediately embed surfacing aggregate at a rate of not less than 400 lbs. per square in the hot bitumen. Aggregate shall be embedded no more than 7 seconds following flood coat application. Apply sufficient aggregate to cover the bitumen completely so that at least 50% of the aggregate is firmly retained in the asphalt. Use a light roller if necessary to ensure

adequate embedment. The application of flood coat and aggregate surfacing shall be performed no later than 30 days from installation of top felt.

- G. Dress the surface so there is no streaking of bitumen and so that the surface is reasonably uniform in thickness and appearance.

3.4 BASE FLASHING INSTALLATIONS

- A. Base flashing is required to be installed at the base of all curbs, walls and other vertical surfaces.
- B. Starting on the roof surface over 4 plies of previously installed felts, apply a Type III or Type IV asphalt 3" from the base of the cant, over the cant and up to the top edge of the vertical nailer at a rate of 35 #/square.
- C. Embed one fiberglass felt ply into asphalt, lapping ends 3".
- D. Embed one ply of base flashing, lapping ends 3" and extending a distance of 5" from the base of the cant to the top of the wood nailer. (Embed base flashing in Type IV asphalt in ambient temperatures of 45 degrees and below.
- E. Nail the top of the base flashing to the wood nailer one inch below the top edge using flat head barbed roofing nails with a tin disk at 12" o.c.
- F. Flashing materials above base flashing shall be installed from 8" to 12" above the finished roof surface and extend 4" over the base flashing.
- G. Base flashing shall be provided and installed in strict compliance with manufacturer's recommendations.

3.5 SHEET METAL INSTALLATIONS

- A. See section 07 600 - Flashing and Sheet Metal for information relating to the installations of sheet metal products on the roofing surfaces.
- B. Prior to the installation of copings, expansion joints and gravel stops, install a sheet of membrane flashing in a continuous bed of plastic asphalt base roof cement across the top of all perimeter wood blocking and cants, over the roofing felts, extending down the outside face a distance equal to the vertical length of the face of the coping, expansion joint or gravel stop. Install coping, expansion joint or gravel stop over membrane flashing.
- C. Install copings and gravel stops per Flashing and Sheet Metal Section 07 600 with a 1/4" gap between sections.
- D. At miscellaneous flanged flashing installations, comply with the following application procedure:

1. Install flanges in a continuous bed of plastic asphalt base roof cement after the metal has been primed both sides with asphalt based liquid primer. If flange width exceeds 12", secure flange to wood blocking with roofing nails staggered at 3" on center in each direction, and two at each corner.
 2. Except at locations where the flashing is turned in to the top of the penetration, or otherwise integrally secured against water entry, install bonnet flashing extending below and beyond the edges of the flashing riser secured mechanically to the roof penetration following installation of silicone sealant to prevent water intrusion.
 3. Strip flanges with 3 plies of felt and asphalt bitumen. Fit all plies tightly to the vertical flange. Extend the first ply a minimum of 6" beyond the flange edge and extend the second and third plies 6" beyond each successive ply.
- E. Install sheet metal expansion joint covers per SMACNA Manual.

END OF SECTION

SECTION 07 600

FLASHING AND SHEET METAL

I. PART 1 - GENERAL

1.1 SCOPE

- A. Replace flashing and sheet metal at all Phase 3D roof construction, at the 1992 building addition.

1.2 SUBMITTALS

- A. Submit shop drawings which indicate material types, sizes, shapes, thicknesses, finishes, fabrication details, anchors, connections, expansion joints and relation to adjacent work. Drawings shall be drawn to large scale and, where practical, shall be full size.
- B. Submit product data which indicates product description, finishes and installation instructions, including interface with adjacent materials and surfaces.
- C. Submit actual 12" square full spectrum samples of all prefinished sheet metal materials. Submit mock up of actual coping, showing cleats, fastening devices, or pressure treated wood nailers.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Store materials off ground, under waterproof cover. Protect from damage and deterioration.
- B. Handle materials to prevent damage to surface, edges and ends of sheet metal items. Damaged material shall be discarded and replaced.

1.4 QUALITY CRITERIA

- A. All sheet metal shall comply with "Architectural Sheet Metal Manual" published by the Sheet Metal and Air Conditioning Contractors National Association, Inc., latest edition.
- B. Installation of sheet metal items shall comply with National Roofing Contractors Association "NRCA Roofing & Waterproofing Manual" latest edition.
- C. Do not place dissimilar metals in contact with one another, nor in a position where water sheds across dissimilar metals.

1.5 WARRANTY

- A. Warranty flashing and sheet metal work to be free of defects in materials and workmanship for two years.
- B. All flashing products and fasteners used in the roofing installation shall be approved by the roofing manufacturer and shall be included in the roofing guarantee.

II. PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- A. Sheet lead shall be a minimum of 4 lbs/s.f. hard lead.
- B. Soldering Materials
 - 1. Solder shall comply with ASTM D32-66T, alloy grade 50A, 50% pig lead and 50% block tin.
 - 2. Solder flux for galvanized metal and copper shall be muriatic acid neutralized with zinc. For lead it shall be non-corrosive rosin.
- C. Plastic asphalt based roof cement shall comply with ASTM D4586. Products which contain asbestos shall be rejected.
- D. Fasteners shall be of the same material or compatible with sheet metal being fastened.
 - 1. Screws to attach cleats and gutter to nailers shall be stainless steel flathead wood screws, of sufficient length to penetrate substrate $\frac{3}{4}$ " minimum, 2-1/2" long minimum.
 - 2. Expansion shields shall be lead or bronze sleeves.
 - 3. Screws for fastening gutter strap to stiffener bar shall be zinc coated, self-tapping type with round heads.
 - 4. Bolts shall be zinc coated. Furnish with nuts and washers as required.
 - 5. Rivets shall be round head with solid shank.
 - 6. Blind clips and cleats shall be 18 gauge galvanized.
- E. Sheet Steel, Gravel Stops, Copings, Gutters, Downspouts:
 - 1. Concealed flashing shall be 24 gauge galvanized steel.
 - 2. Exposed prefinished steel products shall be 24 gauge galvanized with "KYNAR 500" coating of a color to be selected by Architect from samples provided by Contractor. Basis of design shall be dark bronze.
 - 3. Acceptable manufacturers shall be:
 - a. Peterson Aluminum Corporation
 - b. UNA-CLAD
 - c. Atlanta Metal Products
 - d. Perma-Clad

- e. IMETCO
- f. Architectural Metal Systems
- g. Firestone

F. Stainless Steel

1. All stainless steel used shall be type #302, of standard analysis 18-8 containing a minimum of 17-19 percent chromium, 8-10 percent nickel and 0.08-0.20 percent carbon.
2. Fractures or mill reject sheets that are not uniform in color and finish shall not be used. Sheet color and finish, whether mill or shop finished, shall be uniform throughout and shall have uniform finish and appearance.

G. Reglet Flashing and Counterflashing

1. Concealed reglet and counterflashing shall be 24 gauge galvanized steel.
2. Exposed flashing shall be prefinished roll-formed 24 gauge galvanized steel to match adjacent surfaces with "Kynar 500" resin fluoropolymer. Color must match existing gutters and downspouts.
3. Provide flashing in 10 foot long sections shop formed.
4. Anchors shall be provided at 16" o.c. or as recommended by manufacturer.

2.2 STEEL FABRICATION

- A. All bends shall have a 1/16 inch minimum radius.
- B. Brazing, soldering and welding methods shall be suitable for the product used. Thoroughly remove flux residue after attachment.
- C. Fasteners shall not cause galvanic action with steel.
- D. Parts of fabrications which are concealed or which contact materials causing galvanic action shall be protected by the application of alkali-resistant bituminous paint or other suitable coating before installation.
- E. Provide linear items in 10 foot long sections.
- F. Formed Steel Gravel Stop
 1. Gravel stop shall be fabricated in minimum 10'-0" lengths with 6" wide concealed joint covers and continuous hold down clips.
 2. Front face shall be 6" high, dam height shall be ½" high or as recommended by roofing manufacturer, and front to back length shall be min. 6", or as detailed on drawings. Profile dimensions shall be verified by Contractor before fabrication to insure they coordinate with field conditions.

3. All inside and outside corners shall be factory fabricated one piece construction. Maximum length from corner of bends or breaks to be five feet (5'); minimum length to be two feet (2').
4. Provide ¼" expansion joints at 10' on center per SMACNA manual, using 6" splice plate under joints with 20 mil membrane under splice plate.
5. Gravel stop shall be primed both sides with asphalt based liquid primer.

G. Prefinished Steel Copings

1. Provide in 10'-0" minimum lengths factory formed per profile on drawings. Copings shall be snap-lock style. Cleats shall be continuous 18 gauge galvanized steel on front and back sides.
2. Outside face shall be min. 6" high, inside face minimum 5" high with min. slope of 1" toward roof, except as noted otherwise on drawings.
3. All inside and outside corners shall be factory fabricated one piece construction.
4. Provide expansion joint with interlocking standing seam at 10' on center per SMACNA.

H. Steel Gutters and Downspouts:

1. Downspouts shall be 4" x 6" rectangular in section with locked and sealed longitudinal seams. Upper end shall be flanged ½" and fastened and sealed to gutter lining. Gutter shall be 6" square. Provide heavy duty gutter straps at 2'-6" on center. Provide ¼" x ¾" galvanized steel stiffener bar attached to gutter with ¼" stainless steel bolted at each gutter strap at 2'-6" o.c. Extend to top of nailers. Screw to nailers through back flange of gutter with 2-1/2" long stainless steel wood screws.
2. Gutter and downspout shall be fabricated in sections 10'-0" minimum in length. Anchors shall be stainless steel screws.
3. Provide expansion joints in gutters at maximum 40'-0" on center per SMACNA details for butt type expansion joints.
4. Provide stainless steel sleeves for all fasteners at all down spout installations at EIFS in thickness to be flush with EIFS finish.
5. Downspout connections shall be per SMACNA Manual, Plate Fig. 1-33, 1993 Edition.
6. Gutter expansion joints shall be per SMACNA Manual, Plate 1-7; end cap shall be similar as well (fully soldered).

I. Downspout Boots:

1. All external downspouts shall be covered with three sided (front and sides) rectangular 16 gauge galvanized steel five (5) feet above grade, painted to match downspouts. The pipe shall be secured to the wall with correspondingly sized brackets and stainless steel lag screws and shields. Boot shall be ¼" larger

than downspout in each direction with hemmed edges and sealed at top. Provide PVC square to round transition into PVC pipe and "por-rox" downspout into PVC. Provide molded plastic splash blocks at all roof to roof downspouts.

J. Pipe Curb Assemblies

1. Pitch pans shall not be used. In lieu thereof, provide and install aluminum pipe curb assemblies at all locations where pipes up to 12" in diameter penetrate the roof surface. Curbs shall be 11" high and shall have mitered and welded corner seams and shall be insulated with rigid polystyrene and shall have a flange for attachment to P.T. wood nailers. Units shall include an ABS plastic cover with an EPDM molded rubber cap with boots for pipe penetrations to be secured with two stainless steel clamps.
2. Acceptable products shall include curb mounted pipe portals as manufactured by:
 - a. Portals Plus of Bensenville, Illinois
 - b. Pate Company, Broadview, Illinois
 - c. Manville Curbs

2.3 COPPER PRODUCTS

- A. Roof penetration bonnet (storm collar) flashing shall be fabricated from 20 ounce/sf copper to match SMACNA plate 65, Figure B. Bonnet flashing shall be used on all pipes greater than 12" diameter which penetrate the roof.

2.4 OTHER SHEET METAL FABRICATION

- A. Fabricate sheet metal work in accordance with reviewed shop drawings, contract documents and industry standards. Form sheet metal work with clear, sharp and uniform breaks. Hem exposed edges.
- B. Seam and solder all joints in sheet metal products. Solder sheet metal joints with heavy, well-heated coppers. Pre-tin joints not less than 1- $\frac{1}{2}$ " wide. Provide 1" minimum soldered joints. After soldering, wash joints and neutralize remaining acid with alkaline solution. Paint to match.
- C. Provide linear sheet metal items in minimum 10'-0" sections except as otherwise noted. Form flashing using single pieces for the full width.
- D. Provide prefinished 24 gauge 2-piece reglet at intersections of dissimilar materials where shown on drawings. Continue weather barrier membrane between dissimilar metals.

2.5 SHEET METAL EXPANSION JOINT COVERS

- A. Provide 24 gauge galvanized steel sheet metal expansion joint covers with Kynar 500 resin fluoropolymer finish with 20 yr. manufacturer's warranty. Color shall match gutters and gravel stops.
- B. Detail as shown on drawings and per SMACNA manual.

III. PART 3 - EXECUTION

3.1 SHEET METAL INSTALLATION

- A. Install work in accordance with contract documents and industry standards. Sheet metal items shall be installed true to line, watertight without buckling, waves, creasing, warp or wind in finished surfaces.
- B. Coordinate flashing at roof surfaces with roofing work to provide weathertight condition as soon as practical following roofing installation. Use minimum 6" wide concealed splice plates at gravel stops.
- C. Provide joints at minimum 10'-0" o.c. Joints shall be ¼" between sections.
- D. Isolate dissimilar materials to prevent galvanic action. Separate using bituminous paint both sides or roofing felt. All fasteners shall be fabricated from the same material as the product to be attached, unless noted otherwise.
- E. Form seams in direction of flow. Seams shall be flatlock with cleats filled with sealant. Lap seams occurring in members sloping 45 degrees or more 4" minimum and embed in flashing cement. Miter and solder inside and outside corners of all exposed metal products.
- F. Secure sheet metal items using continuous cleats clips and/or blind fasteners as indicated. No exposed face fastening shall be performed.
- G. Caulk around all roof deck penetrations with silicone sealant to prevent leaks of bitumen and water to interior of building.
- H. Fastening
 - 1. Screws
 - a. Space screws evenly at 4" o.c. on cleats and gravel stops/fascias, staggered at 1" off front and back edge.
 - b. Space screws at 4" o.c. confined to one edge only of flashing 12" or less in width.
 - 2. Cleats shall be continuous in 10'-0" lengths and formed to profile of item being secured.

I. Pipe Curb Installations

1. After roofing felts are completed, install pipe curbs on top of the last ply, bed flanges in asphalt based roofing cement and strip flanges with 3 plies of felts. Fit all plies tightly against flange edge. Extend first ply 6" beyond the flange edge and extend following plies 6" beyond edge of previous plies.
2. Cut PVC boots to accept pipe penetrations and seal each boot with silicone sealant and two pipe clamps.

J. Pre-fabricated Steel Gravel Stops

1. Installation shall be in strict accordance with SMACNA Manual published directions. Specified product installation details provide adequate allowance for expansion and contraction and securing of gravel stop to nailers and these details shall be followed implicitly.
2. Gravel stops shall be secured at front edge to continuous cleats.
3. Prime both sides of gravel stop prior to installation in roof cement.
4. Set gravel stop in roofing cement over 20 mil thick flexible flashing imbedded in roofing cement. Flashing shall extend to back of gravel stop and to bottom of cleat.

K. Pre-fabricated Steel Coping

1. Installation shall be in strict accordance with SMACNA Manual published directions. Specified product installation details provide adequate allowance for expansion and contraction and securing of coping to parapet and these details shall be followed implicitly.
2. Set copings in roofing cement over 20 mil thick flexible flashing set in roofing cement, secured under continuous front and back coping cleats, trimmed even with bottom edge of cleats, and sealed at laps using manufacturer's recommended adhesive. Secure copings with front and back continuous cleats only; do not penetrate coping with mechanical anchors.

L. Strip in metal with three plies of felt and asphalt bitumen. Extend the first ply a minimum of 6" beyond the metal edge and extend the second and third plies 6" beyond each successive ply.

M. Provide for expansion and contraction in sheet metal work at intervals not exceeding the recommendations of the SMACNA manual. Where continuous runs of sheet metal exceeds interval by more than 12', provide additional joint. Where the run is less than interval specified and more than 12', provide one joint at the center of run. Joints shall be evenly spaced. Provide ¼" expansion joints at 10' on center per SMACNA manual, using 6" splice plate under joints for gravel stop.

N. Install lead flashing at all soil vent pipes, extending not less than 12" in all directions beyond outside diameter of pipe.

- O. Review mechanical and electrical drawings and specifications and furnish and install all flashing and curbs required by them, including custom fabricated curbs.
- P. Form all fabricated parts to profiles detailed, maintaining uniformity throughout the project. Hem all edges of sheet metal smoothly and neatly.
- Q. All welding of exposed stainless steel whether specifically specified or not shall be accomplished by the arc welding (heli-arc) method using stainless steel rod of same composition as the parts being welded. Welds shall be free of pits, flaws and peened to remove flux and other impurities. Welds shall be ground smooth and polished to original finish of the metal, with the grain uniform to the grain of the original sheet.
- R. Where grinding and polishing has destroyed the grain restore and blend to obliterate all traces of welding. All welds, whether exposed or concealed on unpolished surfaces, shall be ground back to the surface of the original metal.

END OF SECTION

SECTION 07 651

WALL FLASHINGS

I. PART 1 GENERAL

1.1 SUBMITTALS

- A. Submit product data which indicates product description, finishes and installation instructions, including interface with adjacent materials and surfaces.
- B. Submit actual full spectrum samples of all flashing material.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Store materials at least 6" off ground and under waterproof cover. Protect from damage and deterioration.
- B. Handle materials to prevent damage to surfaces, edges and ends of flexible flashing. Damaged material shall be discarded and replaced.

1.3 QUALITY CRITERIA

- A. Installation shall comply with National Roofing Contractors Association "NRCA Roofing and Waterproofing Manual" latest edition.

1.4 WARRANTY

- A. Warrant flashing and installation to be free of defects in materials and workmanship for two years.

II. PART 2 - PRODUCTS

2.1 THROUGH WALL FLASHING - Typical Unless Noted Otherwise

- A. Acceptable manufacturer's shall include the following:
 - 1. Keystone Flashing Company (800-526-8348).
 - 2. Scott-Lokk (718-384-3456).
 - 3. Cheney (800-322-2873)
 - 4. Fabricated components from Atlanta area fabrication shops are acceptable in the specified material and profile.
- B. Characteristics of wall flashing shall comply with the following requirements:
 - 1. Stainless steel through wall flashing shall be 26 gauge fabricated to the profiles indicated on the Drawings.

2.2 FLEXIBLE FLASHING - Where Shown on Drawings

A. Acceptable manufacturer's shall include the following:

1. B. F. Goodrich, "BFG Vinyl Water Barrier".
2. Sonneborn "Hydrocide vinyl seal"
3. Similar products of other manufacturers shall be subject to Architect's review.

B. Characteristics of flexible flashings shall comply with the following requirements:

1. Flashing shall be 20 mils thick, non-reinforced, homogeneous vinyl sheet with 1800 psi minimum tensile strength and 250% maximum elongation.
2. Adhesive shall be flashing manufacturer's recommended product.

III. PART 3 - EXECUTION

3.1 INSTALLATION OF THRU WALL FLASHING

- A. Install work in accordance with contract documents and industry standards. Steel metal items shall be installed true to line, watertight without buckling, waves, creasing, warp or wind in finished surfaces. Membrane shall be free of holes and tears.
- B. Install wall flashing at exterior door heads, window heads and other wall openings and at weep wick locations, continuous in the bed joint beneath the weep wicks.
- C. Extend flashing 8" beyond opening on each side. Lap joints 3" minimum and seal with adhesive.
- D. Start flashing ½" in from outside face of exterior wythe, extend through cavity, rising not less than 4", and terminate in bed joint of interior wythe, ½" from inside face or tape at interior concrete wall. Do not extend past outside face of brick.
- E. Locate flashing to ensure that portion extending thru exterior brick shall be one brick course above grade or sidewalk. If necessary move thru wall portion in bed joint of interior wythe up one course from slab.
- F. Repair or replace all flashing during construction before covering up.

3.2 INSTALLATION OF FLEXIBLE FLASHING

- A. Install where shown on drawings.
- B. Membrane shall be free of holes and tears. Repair or replace all flashing during construction before coverup.

END OF SECTION

SECTION 07 900

JOINT SEALERS

I. PART 1 - GENERAL

1.1 SCOPE

- A. Work of this section includes furnishing and installing all sealants and caulking compounds where required by contract documents and manufacturers recommendations.
- B. A sealant is a weatherproof elastomer used for filling and sealing joints which has properties of adhesion, cohesion, extensibility under tension, compressibility and recovery Sealants shall be designed to make joints air and watertight. The sealant shall have been tested by the sealant manufacturer for compatibility and performance with the exterior finish. Material shall be designed for application to joints at exterior of structures and for other joints subject to movement and/or moisture infiltration at interior and exterior of structures.
- C. A caulking compound is an acrylic emulsion used for filling joints and seams, having properties of adhesion and cohesion. Caulking compounds shall not be required to have extensibility and recovery properties. It shall be applied to joints at interior of structures not subject to movement or moisture infiltration.
- D. Caulking is the process of filling joints without regard to type of material.
- E. Joint failure refers to a caulked joint exhibiting one or more of the following characteristics:
 - 1. Joint leaks air and/or water.
 - 2. Sealant or caulking compound migrates.
 - 3. Sealant or caulking compound loses adhesion.
 - 4. Sealant or caulking compound loses cohesion.
 - 5. Sealant or caulking compound does not cure.
 - 6. Sealant or caulking compound discolors.
 - 7. Sealant or caulking compound stains adjacent work.
 - 8. Sealant or caulking compound develops bubbles, air pockets or voids.
- F. Clean out all exterior sealant joints and reseal with backer rod, including at brick, concrete, hollow metal.

1.2 SUBMITTALS

- A. Submit manufacturer's product data indicating product description, conformance with specified requirements and installation instructions for each type caulking compound and sealant. Indicate preparation requirements for each substrate condition.
- B. Samples
 - 1. Submit samples of manufacturer's standard caulking compound/sealant material colors and special colors as indicated at least 30 days prior to application.
 - 2. Samples shall be actual materials or literature depicting actual material colors. Architect reserves the right to reject work not in conformance with selected colors based upon samples submitted.
 - 3. Should Contractor select a manufacturer meeting specified requirements, except for minimum color range requirements, the Contractor shall be responsible for furnishing special colors within color range requirements. Special colors shall be submitted for Architect's review.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store materials in manufacturer's unopened packaging with seals and labels intact. Comply with manufacturer's instructions regarding environmental conditions under which materials may be stored.
- B. Handle materials in accordance with manufacturer's printed instructions.

1.4 PROJECT CONDITIONS

- A. Environmental Conditions
 - 1. Install no materials under inclement weather conditions or when temperatures are below or above those recommended by manufacturer.
 - 2. Proceed with work only when forecasted weather conditions are favorable for joint cure and development of high early bond strength.
 - 3. Wherever joint width is affected by ambient temperature variations, install materials only when temperatures are in lower third of manufacturer's recommended installation temperature.
- B. Protection of Adjacent Surfaces
 - 1. Protect adjacent surfaces by applying masking material or manipulating application equipment to keep materials in joint. If masking materials are used, allow no tape to touch cleaned

surfaces to receive sealant. Remove tape immediately after caulking, before surface skin begins to form.

2. Remove misapplied materials from surfaces using solvents and methods recommended by manufacturer.
3. Restore surfaces from which materials have been removed to original condition and appearance.

1.5 WARRANTY

- A. Warrant work to be free from defects in materials and workmanship, including joint failure, for a period of three years beginning at Date of Substantial Completion. In addition to the warranty of the material suppliers, the contractor shall provide a warranty of the interface between the sealant or caulking compound and adjacent surfaces equal to the greater warranty period of the adjacent materials.

II. PART 2 - PRODUCTS

2.1 SEALANTS

- A. Acceptable polyurethane sealant products for installation at exterior expansion joints, control joints, door/window exterior perimeters, other dynamic interior/exterior joints and as a general weatherproofing sealant shall be a two part sealant. Acceptable products include the following:
 1. Tremco "Dymeric 240"
 2. Sonneborne, Division of Contech, Inc., "Sonolastic"
- B. Acceptable mildew resistant silicone sealant products for installation in interior areas subject to high humidity and moisture infiltration shall be a one part acetoxy silicone. Acceptable products shall include the following sealants:
 1. Dow Corning 786
 2. G.E. Silicones Sanitary 1700
 3. Bostock Silicone Rubber Bathroom Caulk

2.2 ACRYLIC-LATEX CAULKING COMPOUND

- A. Caulking compound shall be a flexible, paintable, non-staining, non-bleeding, acrylic emulsion.
- B. Acceptable products shall include the following:
 1. DAP, Inc. - DAP Acrylic-Latex caulk
 2. Sonneborn Division of Contech, Inc. - Sonolac
 3. Tremco Manufacturing Company - Acrylic-Latex caulk

2.3 COLORS

- A. For exposed applications of sealant and caulking compounds, colors shall be selected by Architect.
- B. For unexposed applications provide black color sealant and caulking compounds.

2.4 GLAZING SEALANT

- A. See Section 08 800 for specified product.

2.5 FIRE BARRIER CAULK

- A. Fire barrier caulk shall be a synthetic elastomeric premium latex product with endothermic and intumescent properties designed to prevent fire, smoke, and toxic fumes from penetrating walls for a minimum of 1 hour. Fire barrier caulk shall be installed at all fire rated wall utility pipe penetrations.
- B. Acceptable products shall include the following:
 - 1. 3M fire retardant CP 25 WB caulk.
 - 2. 3M fire barrier moldable putty (MP).
 - 3. Dow Corning firestop sealant.

2.6 ACCESSORY MATERIALS

- A. Provide and install joint cleaner recommended by caulking compound/sealant manufacturer for substrates indicated.
- B. Provide and install joint primer/sealer recommended by caulking compound/joint sealer manufacturer.
- C. Apply polyethylene bond breaker tape to contact surfaces where bond to substrate or joint filler must be avoided for caulking compound/joint sealer performance.
- D. Provide and install compressible back-up rod stock polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam or neoprene foam as recommended by caulking compound/sealant manufacturer for compatibility with material. Provide size and shape of rod to control joint depth, break bond at bottom of joint, form optimum shape of bead on back side and minimize possibility of extrusion when joint is compressed. Acceptable manufacturers shall include Sandell Manufacturing Co. Polytite Acme Highway Products Corp., and Acmasel.
- E. Provide and install tooling agent recommended by caulking compound/sealant manufacturer to ensure contact of material with inner joint faces.

- F. Provide and install synthetic rubber or closed cell synthetic foam divider strips not less than 1/16" thick and full depth of caulking compound/sealant. Strips shall be approved by manufacturers of dissimilar materials as being compatible with each.
- G. Provide precompressed expanding foam sealant composed of open cell polyester polyurethane foam impregnated with neoprene rubber. Sealant shall be factory produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to degree specified by manufacturer. Provide products which are permanently elastic, mildew resistant, non-migratory, nonstaining, compatible with joint substrates and other joint sealants. The following product is acceptable, similar products of other manufacturers shall be subject to Architect's review.
 - 1. Will-Seal construction foams: "Will Seal 150"

III. PART 3 - EXECUTION

3.1 JOB MOCK-UP

- A. Prepare, caulk and finish one sample of each interior and exterior joint condition for Architect's review. Joints may be a portion of the permanent construction.
- B. Sample joints shall be reviewed by Architect prior to beginning work. Retain reviewed samples as a standard for work.

3.2 JOINT SURFACE PREPARATION

- A. Clean joint surfaces immediately before caulking joints. Remove dirt, unsecure coatings, moisture and other substances which would interfere with bond.
- B. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless caulking compound/sealant manufacturer's printed instructions indicate that alkalinity does not interfere with bond and performance. Etch with 5% solution of muriatic acid and neutralize with dilute ammonia solution. Rinse with clean water and allow to dry before caulking.

3.3 APPLICATION

- A. Comply with caulking compound/sealant manufacturer's printed installation instructions except where more stringent requirements are shown or specified.
- B. Prime or seal joint surfaces where recommended by caulking compound/sealant material manufacturer. Do not allow primer/sealer to spill or migrate onto adjacent surfaces.

- C. Install backup rod for all caulking compound/sealant materials, except where recommended to be omitted by material manufacturer for application indicated.
- D. Apply installation techniques which will ensure that caulking compound/sealant materials are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces. Except as otherwise indicated, fill joint to concave surface, slightly below adjoining surfaces. Where joints are between a horizontal surface and a vertical surface, fill joint to form slight cove, so that joint will not trap moisture and debris.
- E. Do not allow materials to overflow or spill onto adjacent surfaces. Use masking tape or other precautionary devices to prevent staining of adjacent surfaces.
- F. Remove excess and misplaced materials as work progresses. Clean the adjoining surfaces to eliminate evidence of misplaced materials without damage to adjacent surfaces and finishes.
- G. Exterior finish material shall be cured prior to sealant application.
- H. Cure caulking compound/sealant materials in accordance with manufacturer's printed instructions to obtain high early bond strength, internal cohesive strength and surface durability.

3.4 CAULKING SCHEDULE

- A. Install sealant in exterior exposed joints including around perimeter of all framed openings in exterior walls and where shown on drawings. Also apply sealant to interior joints subject to moisture infiltration and/or movement.
- B. Install acrylic latex caulking compound in interior exposed joints, including around perimeter of all framed openings in exterior and interior walls and where shown on drawings. Do not apply acrylic latex caulking compound to interior joints subject to moisture infiltration and/or movement.
- C. Install mildew resistant silicone sealant products in all kitchen toilet and custodial closet areas, including joint between gypsum board ceiling and adjacent CMU.
- D. Caulk all intersections of flooring material with dissimilar materials, with silicone sealant in a color to be specified by the Architect.
- E. Install acrylic latex caulking compound at intersection with CMU.
- F. Install caulking at all existing open joints in areas to receive new paint.

- G. Caulk perimeter of fire extinguisher cabinets, plastic laminate cabinets and tops.
- H. Install full bed of sealant under all exterior thresholds, and at all threshold edges.
- I. Install clear silicone sealant across top of water coolers.
- J. Install sealant at all new and existing interior and exterior expansion and control joints, including at CMU, concrete, exterior finish and concrete floors.
- K. Install sealant at all control joints in porcelain tile.

END OF SECTION

SECTION 08 100

METAL DOORS AND FRAMES, METAL WINDOW FRAMES

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit shop drawings indicating door and frame elevations sections, materials, gauges, finishes, fabrication and erection details, location of finish hardware by dimension and locations and details of openings for glass and louvers.
- B. Submit manufacturer's literature indicating product description and characteristics, including compliance with specified requirements and manufacturer's recommended maintenance instructions. Mark manufacturer's brochures to include only those products proposed for use.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver hollow metal work cartoned or crated for protection. Use spreaders at frame bottoms to prevent twisting.
- B. Inspect work upon delivery for damage. Reject damaged items.
- C. Store materials under waterproof cover on raised platforms in a vertical position with blocking between units to allow for air circulation.

1.3 QUALITY CRITERIA

- A. Fabricate members in accordance with SDI-100, Steel Door Institute (SDI) Level III, Model I Standards and ANSI 250.8 Latest Edition, except where more stringent requirements are specified herein.
- B. Cold rolled material shall comply with ASTM A525.
- C. Allowable Manufacturing Tolerances
 - 1. Overall dimensions: 1/16" maximum variation.
 - 2. Doors and frames shall have a maximum 1/8" variation in diagonal dimension.
- D. Labeled components shall comply with the requirements of Underwriter's Laboratories, Inc. (UL) and the National Fire Protection Association (NFPA). Label shall be screw or rivet attached metal plate, not adhesive attached paper.

- E. All doors and frames shall be manufactured by the same company.
- F. Window frame assemblies shall restrict air infiltration to .31 CFM/SF of door area when tested in accordance with ASTM E-283.
- G. All doors shall conform to ANSI-A250.4-1994 Level "A" criteria, tested to 1,000,000 cycles and 23 twist tests. Submit certification from distributor.
- H. ANSI-A250-10 Test Procedures and Acceptances Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- I. ASTM A-366 and A-568 for Steel Manufacturer.
- J. ASTM-A569 Internal Reinforcing.
- K. ANSI A-250.10 Coatings Material.

II. PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Acceptable manufacturers are:

1. Steelcraft
2. Ceco
3. Curries
4. Amweld
5. Mesker

2.2 DOORS AND FRAMES

- A. Doors and frames shall be primed in accordance with the requirements of Section 09 900 following phosphatizing of surfaces for paint adhesion for interior and also galvanization for exterior.
- B. Flush Metal Doors
 1. Doors shall be 16 gauge steel.
 2. Doors shall have continuous vertical, interlocking joints at both lock and hinge edges.
 3. Vertical edges shall be beveled 1/8" in 2".
 4. Exterior and interior metal doors:
 - a. Exterior metal doors: A60 galvanized with polystyrene core. Minimum U-factor shall be 0.21.
 - b. Interior metal doors: Cold rolled steel. Acceptable core construction:
 - (a) Resin impregnated honeycomb.
 - (b) Polystyrene.
 - (c) 450 degree temperature rise fire door core.
 - (d) Mineral wool.

- c. Polystyrene and resin impregnated honeycomb core doors: Bond both sheets to core through application of adhesive to both door faces and core prior to assembly. Completely expand and fill inside of door with core. Cold rolled steel sheet material shall comply with ASTM A525.
 5. Bottom channel must be inverted. Provide weep holes in bottom channel to allow for escape of entrapped moisture.
 6. Top of doors shall have a box or channel type reinforcement for flush smooth, finished top with no openings or uneven areas that would permit water infiltration. All joints shall be caulked with sealant and painted for water tight finish.
 7. All doors shall be mortised for template hinges and other required hardware.
 8. Provide box or channel type reinforcement at lock and closer locations. Provide 7 gauge hinge reinforcements in doors and frames securely welded to door.
 9. Glass lite frames in doors and frames shall be fabricated of cold rolled steel at interior openings. Provide G60 galvanized at exteriors. Lite kits shall be 18 gage minimum. Glazing frame shall be 4-sided, mitered, reinforced and welded assembly and shall overlap interior and exterior of door face cutout. Attach using countersunk oval head machine screws at 12" o.c. maximum. Fasteners shall be on the secured side of the door. No snap glazing stops will be allowed.
 10. Fire labeled doors shall have a 450 degree temperature rise rating. Fire doors with asbestos are not acceptable.
 11. Field drill doors for thru-bolting.
- C. Welded Door and Window Frame Construction
1. All metal frames, unless otherwise noted, shall be 14 gauge steel construction at exterior and 16 gauge steel construction at interior, with joints die mitered, set up and welded at the miters, dressed and ground smooth. Provide frames with temporary spreaders during shipping and handling.
 2. Hinge reinforcements shall be 7 gauge steel drilled and tapped by the frame manufacturer to provide a minimum pullout strength of 1668 #/fastener. Provide minimum 3/16" plate at hinge side of header to receive closer arm bracket. Hinge jambs shall be mortised for lock strikes.
 3. Throat of interior door and window frames shall be sized to wrap around wall and applied finishes.
 4. Door Frames shall have 2" exposed faces with integral 5/8" high integral stops, except door heads at exterior shall have 4" exposed face at locations without transoms.
 5. Window frames shall have 2" exposed faces with 5/8" high integral stops and 5/8" high 20 gauge steel mitered corner stops applied with countersunk oval head machine screws at 12" o.c. Stops shall be predrilled and precut on room side of window (away from lock) at interior locations and on exterior side of exterior windows. Holes shall be drilled to accommodate window glazing

- requirements in Section 08 800 and as detailed on drawings. Provide 6" high exposed face at floor locations as shown on drawings.
6. At window frames, manufacturer shall install applied hollow metal stops. Window stops shall be applied to the exterior of windows at exterior locations and at room interiors at interior locations
- D. Frame Anchors
1. Wall anchors for frame attachment to exterior masonry construction with brick veneer shall be perforated offset T-shaped anchors to suit frame size, with legs not less than 2" wide by 10" long. Provide one anchor per jamb for each 24" of frame height or fraction thereof. Exposed fasteners shall not be used to anchor hollow metal frames.
 2. Wall anchors for interior frames shall be 3/16" wire anchor, capable of being installed in rated frames.
 3. 16 gauge floor anchors shall be clip type adjustable to receive two fasteners per jamb, welded to bottom of jambs and mullions.
- E. Removable mullions, where specified in finish hardware - Section 08 710, shall be constructed from 16 gauge steel. Mullions shall be attached to hollow metal frames with #8 x 1/2" FHMS in 4 places at the sill and 8 places at the head. Mullions shall have 12 gauge welded, tapped steel reinforcement plates for screw attachment to tapped 12 gauge steel mounting brackets anchored to the slab at the sill and frame at the head. Mullions subject to exterior exposure shall be A-60 galvanized. Interior mullions shall be phosphatized and prime painted.
- F. Preparation for Hardware
1. Reinforce components for hardware installation in accordance with SDI-107, except where more stringent requirements are called for.
 2. Punch single leaf frames to receive three silencers. Double leaf frames shall receive two silencers unless a mullion is be used. Mullions shall be punched to receive four silencers.
 3. Factory prepared hardware locations shall be in accordance with locations specified in Section 08 710.
- G. Hollow metal astragals where specified in finish hardware, Section 08 710, shall consist of a 16 gauge edge channel attached to inactive door leaf with #10 x 1/2 flat head sheet metal screws and overlapping 12 gauge steel strip attached to active leaf with a #8 x 5/8 sheet metal screws at 6" o.c. Interior astragals shall be constructed from phosphatized steel. Edge channel shall be prepped for a strike where required. Astragals subject to exterior exposure shall be A-60 galvanized.
- H. See Section 08 800 - Glass and Glazing for information relating to glass requirements for doors, sidelights and windows.

III. PART 3 - EXECUTION

3.1 SETTING FRAMES

A. Welded Frames

1. Set welded frames in position prior to beginning partition work. Brace frames until permanent anchors are set.
2. Set anchors for frames as work progresses. Provide mortar guards at frame mortises. Provide a minimum of 3 anchors per jambs.
3. Grout hollow metal frames in CMU walls solid. Mortar is not an acceptable substitute. If antifreeze additive is used in the grout, interior surfaces of all applicable frames shall be coated with a 10 mil thickness of asphaltic bitumen prior to frame installation.
4. Remove temporary braces and spreaders after wall construction is complete.

B. Caulking

1. All metal frames shall be fully caulked against adjacent wall surfaces with caulking compound at Interior areas and sealant at all exterior locations.

3.2 DOOR INSTALLATION

- ##### A. Install metal doors in frames using hardware specified in Finish Hardware - Section 08 710.

B. Edge clearances at doors shall be as follows:

1. Between door and frame at head and jambs: $\frac{1}{8}$ "
2. At carpeted floors without pad: $\frac{3}{4}$ "
3. At mud bed quarry tile floor: varies w/condition
4. At thin set quarry tile floor: $\frac{3}{4}$ "
5. At resilient tile floor: $\frac{5}{8}$ "
6. At exposed concrete floor: $\frac{3}{8}$ "

3.3 PAINTING

A. Metal Frames

1. Marred prime coat finish shall be thoroughly cleaned, touched-up and sanded smooth to match prime coat.
2. Finish paint shall be brush applied.

B. Metal Doors

1. Marred prime coat finish shall be thoroughly cleaned, touched-up and sanded smooth to match prime coat.
2. Finish paint shall be roller applied to all six sides of all metal doors prior to hardware installation in accordance with Specification Section 09 900 - Painting.

END OF SECTION

SECTION 08 210

WOOD DOORS

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Shop Drawings shall indicate door sizes, construction and hardware locations. Dimension and detail openings for glass lites and louvers.
- B. Submit 12" x 12" door corner samples indicating face veneers, stain color, sealer, edge bands and core construction for each door type specified.
- C. Submit manufacturer's literature indicating product description and characteristics, including compliance with specified requirements and manufacturer's recommended maintenance instructions. Mark manufacturer's brochures to include only those products proposed for use.
- D. Submit sample manufacturer's warranty.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver no doors to project until weatherproof storage space is available. Store doors in a space having controlled temperature and humidity. Stack doors flat and at least 6" off floor.
- B. All 6 edges of doors shall be factory finished. **NOTE: GENERAL CONTRACTOR SHALL SEAL TOPS AND BOTTOMS OF ALL DOORS IMMEDIATELY AFTER REMOVING FACTORY WRAP. THIS IS REQUIRED IN ADDITION TO SEALER PROVIDED AT THE FACTORY. GENERAL CONTRACTOR SHALL SEAL TOP AND BOTTOM AGAIN AFTER ANY CUTTING OR SANDING.**
- C. Provide corrugated cardboard protection for door faces in contact with other surfaces. Doors shall be individually shrink wrapped with 6 mil polyethylene.
- D. Do not walk over or stack other materials on top of stacked doors. Do not drag doors across one another.
- E. General Contractor must examine each door upon receipt and protect from damage from all trades.

1.3 QUALITY CRITERIA

A. Allowable Fabrication Tolerances

1. Overall dimension may vary plus or minus 1/16".
2. Maximum warp, bow, cut or twist shall be ¼".
3. Maximum ¼" difference in diagonal measurements shall be allowed.

B. Regulatory Requirements and Quality Standards

1. National Woodwork Manufacturer's Association (NWMA), NWWMAIS 1-A or AWIQS Section 1300, Type I Bond
2. WDMA I.S 1-A Premium Grade
3. NFPA 252 and 80
4. AWI Quality Standards
5. ANSI A115

C. Provide each door with a stamp, brand or label which identifies manufacturer, trade association of which he is a member, grade, type of door and industry standard with which it complies.

D. Labeled components shall comply with Underwriter's Laboratories, Inc. (UL) and the National Fire Protection Association (NFPA). Label shall be screw or rivet attached metal plate, not adhesive attached paper. Rated doors shall conform to UL 10C, Category A, positive pressure requirements.

1.4 WARRANTY

A. A written warranty from the door manufacturer shall be delivered to the Architect before the work will be accepted.

1. Submit written agreement in door manufacturer's standard form signed by the Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or which show telegraphing of construction below in face veneers, as defined in NWMA Standard Door Warranty, except in NWMA provisions for refunding the price received by the door manufacturer for any defective door shall not apply. The warranty shall include finish. Warranty shall also include labor for reinstallation which may be required due to repair or replacement of defective doors. Warranty shall be in effect for the life of the installation to begin at the date of substantial completion.

B. Doors which warp so as to prohibit door from latching upon normal closing, or are incorrectly sized for frame to allow for normal closing shall be replaced. This assessment will begin at date of substantial completion.

II. PART 2 - PRODUCTS

2.1 SOLID CORE FLUSH DOORS

- A. Acceptable manufacturers:
 - 1. VT Industries (1-800-882-7732)
 - 2. Marshfield
 - 3. Oshkosh
 - 4. Graham
 - 5. Eggers.
- B. Construction shall be 1-3/4" thick, edge banded, 5 ply structural composite core for non-rated doors and mineral core for doors with up to a 1-½ hour fire rating. Provide SLM blocking. At all fire rated doors, provide 5" blocking at top and bottom and provide 5" x 10" lock blocks at latch and hinge locations. Exposed style edges must be minimum 1/4" matching hardwood to be applied after cross bands. Exposed cross bands are not acceptable.
- C. Face veneers shall be rotary cut select white birch.
- D. Edge bands and moldings shall be light birch to match face veneer on door stiles and top and bottom rails.
- E. View lite kits shall be metal for all rated and non-rated doors, prime painted gray to be finish painted by painter. Frame shall overlap interior and exterior face of door.
- F. Adhesive shall comply with Commercial Standard CS-171, Type I.
- G. See Specification Section 08 800, Glass and Glazing for door lites.
- H. Doors shall be factory finished on all six sides with Minwax, Sherwin Williams, Duron, or Porter "Fruitwood" stain, sanding sealer and 2 finish coats of clear satin polyurethane varnish. Other acceptable color is by Marshfield #10770C. Manufacturer shall submit wood stain samples for Architect's selection. If samples do not match GCPS standard fruitwood color, manufacturer shall resubmit as many times as necessary to achieve the correct match.

III. PART 3 - EXECUTION

3.1 PREPARATION

- A. Door manufacturer's representative shall be responsible for coordinating necessary information received by Contractor from hardware and metal frame manufacturers in order that doors shall be properly prepared to receive hinges and other hardware and fit hollow metal frames properly. Contractor shall provide door manufacturer with 3 copies of reviewed door frame shop drawings and reviewed hardware schedules. All information shall be in the possession of door manufacturer 90 days prior to delivery date.

3.2 INSTALLATION

- A. Condition doors to average prevailing humidity in installation area prior to hanging for a minimum of 24 hours.
- B. Install wood doors in accordance with manufacturer's instructions.
- C. Fit doors to frame for proper fit and uniform clearance at each edge and factory machine for hardware. Factory seal cut surfaces after fitting and machining.
 - 1. Bevel non-fire-rated doors 1/8" in 2" at lock and hinge edges.
 - 2. Bevel fire-rated doors 1/16" in 2" lock edge.
- D. Clearances around perimeter of doors shall be as follows:
 - 1. On hinge side: 1/16"
 - 2. On lock side: 1/8"
 - 3. Meeting edges at pairs of doors: 1/8"
 - 4. At terrazzo floors: 3/8"
 - 5. At carpeted floors without pad: 3/4"
 - 6. At mud bed quarry tile floor: varies w/condition
 - 7. At thin set tile floor: 3/4"
 - 8. At resilient tile floor: 3/8"
 - 9. At exposed concrete floor: 3/8"
 - 10. Set threshold with tops flush at barrier free toilets.
- E. Provide cut-outs for glass lites without damaging door faces.
- F. Machine doors for hardware using templates furnished by hardware manufacturer. Provide factory drilled pilot holes.
- G. Factory seal cut-outs immediately after cutting or machining with one coat of solvent type sealer.
- H. Replace or rehang doors which bind or sag and doors with improper machining visible in finished work.
- I. Clean soil, smudge marks and handling defects from doors. Replace doors from which marks cannot be removed.

3.3 PROTECTION

- A. Upon completion of the installation, the subcontractor and the Contractor shall jointly inspect the work and if satisfactory, the Contractor shall accept the work.
- B. Upon acceptance of the work, the Contractor shall be responsible for the protection of wood doors.

END OF SECTION

SECTION 08 330

ELECTRICALLY OPERATED OVERHEAD DOORS

I. PART 1 - GENERAL

1.1 SCOPE

- A. Work under this section of the specifications include all labor, materials, equipment and services required to completely furnish, install and adjust all electrically operated overhead doors as shown on the drawings or herein specified.
- B. Structural steel frames for openings will be erected under another Division.
- C. Design doors of special construction for high cycle use. Expected cycles of up to 50 per day.

1.2 SUBMITTALS

- A. Reference Section 01 330 Submittal Procedures; submit the following items:
 - 1. Product Data.
 - 2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
 - 3. Quality Assurance/Control Submittals:
 - a. Provide proof of manufacturer ISO 9001:2000 registration.
 - b. Provide proof of manufacturer and installer qualifications - see 1.3 below.
 - c. Provide manufacturer's installation instructions.
 - 4. Closeout Submittals:
 - a. Operation and Maintenance Manual.
 - b. Certificate stating that installed materials comply with this specification.

1.3 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer Qualifications: ISO 9000:2000 registered and a minimum of five years experience in producing doors of the type specified.
 - 2. Installer Qualifications: Manufacturer's approval.

1.4 DELIVERY STORAGE AND HANDLING

- A. Follow manufacturer's instructions.

1.5 WARRANTY

- A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.

II. PART II - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of design shall be Overhead Door Corporation, Model #F-2651 with electric operator.
- B. Raynor Manufacturing Co., Series SC.
- C. Southwestern Rolling Steel Door Company.
- D. Wayne Dalton.
- E. Cornell Iron Works.
- F. Cookson.

2.2 CURTAIN

- A. Curtain shall consist of 24 gauge commercial quality, hot dipped galvanized (G90) steel front and back, per ASTM A525 and 526.
- B. Slats shall be flat, insulated with foamed in place polyurethane with minimum R value of 7.7.
- C. Finish shall be baked-on polyester powder-coat enamel in color to be selected by Architect from minimum 25 color selections.
- D. Nylon endlocks shall be provided on alternate slates to prevent lateral movement.
- E. Curtain shall be designed to withstand a wind load of 20 p.s.f.
- F. Bottom bar shall be minimum two 2" x 2" x 1/8" structural steel angles with powder coat finish and weatherstripping.

2.3 GUIDES

- A. Fabricate with stainless steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth

for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.

Top 16-1/2" (419.10 mm) of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service:

1. Finish:
 - a. Steel: Phosphate treatment followed by baked-on polyester powder coat. Color to be selected by Architect from manufacturer's color range of minimum 25 colors.

2.4 COUNTERBALANCE SHAFT ASSEMBLY

- A. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03" per foot (2.5 mm per meter) of width.
- B. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs. (110 N). Provide wheel for applying and adjusting spring torque.
- C. Barrel shall be constructed to facilitate access to counterbalance assembly and bearings.

2.5 BRACKETS

- A. Brackets shall be of steel plate, minimum 3/16" thick. Drive side bracket shall be fitted with sealed ball bearings at rotating support points to support counterbalance shaft assembly and from end closures.

2.6 HOOD

- A. Hood shall be of 24 gauge galvanized steel, baked-on enamel finish, with rolled edges and shall have wind baffle and lintel seal. Provide minimum 1/4" steel intermediate support brackets as required to prevent excessive sag. Finish shall be baked-on enamel. Finish to match door curtain.

2.7 WEATHERSTRIPPING

- A. Replaceable, 3-point, compressible vinyl gasket extending into guides.
 1. Bottom Bar, Motor Operated Doors: Weather/sensing edge within neoprene or rubber astragal extending full width of door bottom bar.
 2. Guides: Vinyl strip sealing against fascia side of curtain.
 3. Hood: Neoprene/rayon baffle to impede air flow above coil.
 4. Lintel Seal: Nylon brush seal fitted at door header to impede air flow.

2.8 ACCESSORIES

A. Locking:

1. Manual Chain Hoist: Padlockable chain keeper on guide.

2.9 POWER OPERATION

- A. Curtain shall be electrically operated UL listed with emergency chain operation: Motor shall be ½ h.p., 208 volt, three phase 60 Hz, totally enclosed and separated from reduction mechanism for ease of maintenance. Chain drive shall operate the door at a rate of not less than 8" per second. Brake shall be spring set and solenoid operated and be able to stop and hold curtain in any position. Control voltage, 24 volts. Control station: three push button; open, close, stop in NEMA 1 enclosure. Verify all power requirements.

2.10 SENSING EDGE

1. Weather/Sensing Edge: Provide automatic reversing control by an automatic sensing switch within neoprene or rubber astragal extending full width of door bottom bar.
 - a. Provide an electric sensing edge device. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to fully opened position. Provide a self-monitoring wireless sensing electric cord connection between bottom door operation preventing damage, injury or death due to an inoperable sensing edge system.

III. EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
- C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLATION

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. Follow manufacturer's installation instructions.

3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test and adjust doors for ease of operation, free from warp, twist or distortion.

3.4 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

3.5 DEMONSTRATION

- A. Demonstrate proper operation to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION

SECTION 08 410

ALUMINUM STOREFRONT

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit shop drawings in accordance with these specifications. Indicate aluminum storefront in elevation with sections and details at full scale. Include glass and metal thicknesses, joining details, field connections, anchorage, provisions for expansion, fastening and sealing methods, reinforcement, metal finishes and glazing accessories.
- B. Submit 6" x 6" corner samples indicating selected color to be expected in finished work.
- C. Submit independent infiltration test results of aluminum entrances and storefront in accordance with ASTM E-283
- D. Submit manufacturer's literature indicating product description and characteristics, including compliance with specified requirements and manufacturer's recommended maintenance instructions. Mark manufacturer's brochures to include only those products proposed for use.

1.2 PROJECT CONDITIONS

- A. Protect aluminum surfaces from contact with lime, mortar, cement, acids and other harmful materials and from careless handling, storage and machining.
- B. Allowable Tolerances
 - 1. Maximum variation from plumb, level or designated position shall be 1/8" in 12'-0", not to exceed 1/4" in a total run.
 - 2. Maximum offset in alignment between two consecutive members in line, end to end shall be 1/16".
 - 3. Maximum offset between framing members at corners of glazing pocket shall be 1/32".
- C. Submit manufacturer's relevant loading tables or calculations demonstrating that storefront system meets structural loading requirements.

1.3 WARRANTY

- A. Manufacturer shall provide a 10-year material warranty against fading, chalking, erosion and color retention.
- B. Installer shall provide a two-year warranty covering installation.

II. PART 2 - PRODUCTS

2.1 STOREFRONT MATERIALS AND FINISH

- A. Material shall be 6063-T5 aluminum alloy, 0.080" wall thickness for structural members and 0.050" wall thickness for glazing moldings.
- B. Fasteners shall be hardened aluminum or stainless steel. Exposed fasteners shall be countersunk and shall match storefront in color.
- C. Basis of design finish shall be dark bronze Permanodic, anodized, Class 1. Final color shall be selected by the Owner.

2.2 STOREFRONT

A. Framing Characteristics

- 1. Framing shall be designed for full height applied stop glazing.
- 2. Head and Jamb member size shall be 2" x 4-1/2". Sill member size shall be 2" x 4-1/2" or 8" solid x 4-1/2" as shown on drawings. Basic members shall be the same nominal dimension. Members shall comply with local wind load requirements. Acceptable products shall include:
 - a. Kawneer Co., Inc. - "Trifab VG 451T" (Thermal break product specified.)
 - b. Armalite Arco Building Products (Thermal break equal to Kawneer)
 - c. PPG Industries, Inc. (Thermal break equal to Kawneer)
 - d. Tubelite Division, Indal, Inc. (Thermal break equal to Kawneer)
 - e. EFCO Corporation (Thermal break equal to Kawneer)
 - f. YKK (thermal Break equal to Kawneer)
 - g. The Vista Wall Group "FG-3200 Pour and Debridge"
 - h. United States Aluminum
- 3. All framing members shall incorporate a thermal barrier which eliminates all direct contact between interior and exterior aluminum section.
- 4. Glazing pocket depth shall be as recommended by glass manufacturer for type of glass installed.
- 5. Glazing gaskets shall be extruded EPDM rubber.
- 6. System shall be self-draining and include manufacturer's flashing.
- 7. Components shall be parts of a single manufacturer's approved system.

8. Window and frame assemblies shall restrict air infiltration to 0.5 CFM/LF of sash crack when tested in accordance with ASTM E-283. Submit independent test results for architect's review.
9. Storefront system shall satisfy glazing manufacturer's requirements.
10. Construct frames to provide a maximum deflection of $l/175$ with no permanent deformation with a wind load of 20 psf. Framing and anchorage systems shall allow for differential building settlement.

2.3 FABRICATION

- A. Fabricate and assemble framing with joints only at intersections of members with uniform hairline connections.
- B. Drill and cut members using template for finish hardware. Reinforce frames, door stiles and rails to receive finish hardware in accordance with door manufacturer's recommendations.

III. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install storefront in accordance with manufacturer's printed instructions and reviewed shop drawings. Install plumb, level, true to line and within specified tolerances.
- B. Attach storefront to structure on all sides to resist applicable wind design pressures per IBC Sections 2403.2 and 3, and 2404.1 and 2. Applicable wind design pressures can be found with Component Cladding Loading Zone Diagram on drawings, Sheet S-001.
- C. Protect aluminum in contact with masonry, steel, concrete or other dissimilar material by neoprene gaskets or bituminous coating.
- D. Before anchoring to structure, shim and brace work plumb, level and in designated locations.
- E. Locate expansion mullions in accordance with manufacturer's recommendations and as indicated on reviewed shop drawings.
- F. Install flashing to ensure system drainage to exterior. Set storefront units in full beds of sealant.
- G. Caulk exterior of storefront joints using silicone sealant in color to match storefront. Caulk interior joints with caulking compound to match interior wall color. Install in accordance with Section 07 900 - Joint Sealers. Submit sealant colors to Architect for selection.

- H. Clean exposed aluminum surfaces at completion of work just prior to date of substantial completion. Repair or replace work damaged or stained by subsequent work.
- I. Frames shall be manufactured and installed so that back-up rod can be installed for caulking perimeter joints.

END OF SECTION

SECTION 08 710-G

FINISH HARDWARE

I. PART 1 - GENERAL

1.1 SCOPE

A. The following items of hardware are included in this section of the specifications. Furnish all labor and equipment necessary for the proper installation of these items.

1. Hinges
2. Locksets, Latchsets and Cylinders
3. Exit Devices
4. Closers
5. Silencers
6. Stops, Bumpers and Holders
7. Plates
8. Weatherstripping and Seals
9. Metallic Thresholds
10. Astragals

1.2 SUBMITTALS

A. Schedules

1. No later than two weeks following the Notice to Proceed date, the Contractor shall submit to the Architect for review 6 copies of the finish hardware schedule and keying schedule complete with all details.
2. The finish hardware schedule shall be submitted in hardware sets to match the specifications and shall be fully itemized, including manufacturer's name and catalog numbers, dimensions, and installation location of each and every item. It shall also include a recommended keying layout. After the submittal has been reviewed by the Contractor and Architect, a confirmed copy shall accompany the shipment of hardware and the labels on the packages of hardware shall be cross-referenced to corresponding item numbers on the schedule. Final accepted schedule shall be strictly adhered to and no substitutes shall be accepted.
3. Submit two copies of manufacturer's data for each item of finish hardware. Include information necessary to show compliance with specified requirements, and include instructions for installation and maintenance of operating parts and exposed finishes. Where required, furnish templates to fabricators of other work which is to receive finish hardware. Indicate by transmittal that a copy of applicable data has been distributed to the installer.

4. Architect's review of the schedule shall not relieve the hardware supplier of the responsibility to furnish hardware in all quantities required and in conformance with this specification.

B. Keying

1. Contractor shall review proposed keying schedule with Architect and Owner's Representative and note any deviations from system indicated in this specification.
2. Submittal shall include Owner-approved keying schedule information as an appendix to Hardware Schedule.
3. All keying for locksets, deadbolts, and exit devices will be done by Lawrenceville District Maintenance Shop.

- C. Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Coordinate hardware with other work. Tag each item or package separately with identification related to the final hardware schedule and include basic installation instructions in the package. Furnish hardware items of proper design for use in doors and frames of the profile, security and similar requirements indicated, as necessary for proper installation and function with regards to code requirements, regardless of omissions or conflicts in the Contract Documents. Deliver individually packaged hardware items when and where directed by the Contractor for installation, in manufacturer's original packaging and protect from damage.
- B. Provide secured storage for hardware delivered to the project prior to installation date. Control the handling and installation of hardware items which are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses, both before and after installation.

1.4 QUALITY CRITERIA

- A. The supplier shall be a firm technically qualified and experienced in detailing and fitting of finish hardware. The supplier shall be a factory authorized distributor with offices and warehouse facilities within a 150 mile radius of Atlanta, GA. Refinements such as butt, knuckle clearance, strike lip length, adjustment, beveling, rabbeting or rounding of lock faces and centering of locksets will be expected and shall be indicated in the submitted hardware schedule. Supplier shall have a competent Architectural Hardware Consultant available for consultation, when requested by General Contractor, Architect or Owner. It is the responsibility of the supplier to detail the entire project thoroughly. Supplier shall prepare a complete schedule including all items proposed for each opening.

- B. Provide hardware for fire-rated openings in compliance with NFPA Standards No. 80 and No. 101. This requirement takes precedence over other requirements for such hardware. Provide only hardware which has been tested and listed by Underwriter's Laboratories (UL) for the types and sizes of doors required, and complies with the requirements of the doors and door frame labels.
- C. All hardware shall comply with requirements of Federal, State and Local Codes having jurisdiction over this installation. Door Hardware for all doors to barrier free spaces and along accessible routes shall comply with requirements of ANSI A117.1 and Georgia accessibility requirements.
- D. Hardware shall be uniform in color and free of imperfections affecting serviceability or appearance.
- E. Hardware manufacturer's representative shall inspect hardware installations to confirm all installation recommendations and adjustments have been with. This requirement shall apply to all hardware items. A certificate of compliance shall be submitted with the closeout documents.

1.5 WARRANTY

- A. Manufacturer shall warrant door closers against failure due to defective materials and workmanship for a period of five (5) years beginning at date of substantial completion. Closers judged defective during this period shall be replaced or repaired at no cost to the Owner.
- B. Manufacturer shall warrant exit devices against failure due to defects in material or workmanship for a period of three (3) years.
- C. All other warranties shall be one (1) year unless noted otherwise.

II. PART 2 - PRODUCTS

2.1 KEYING

- A. A detailed key system shall be an integral part of the job use schedule. All locksets shall be supplied with a minimum of two (2) change keys and six master keys. All cylinders and locksets shall be set up on a master key and great grand master. All keying for locksets, deadbolts and exit devices will be done by the Lawrenceville District Maintenance Shop.
- B. All locksets shall be furnished with Sargent "RB" Keyway "Zero" keyed cylinders and shall be keyed into the manufacturer's standard key systems established for the Gwinnett County Board of Education.
THE GWINNETT COUNTY MASTER KEY SYSTEM SHALL NOT BE PRODUCED NOR FURNISHED UNDER ANY CIRCUMSTANCES.

All keying systems and information shall be reviewed by the Construction Coordinator. Biting list must be submitted to the Owner. Contractor shall submit letter to Owner's construction coordinator verifying hardware supplier, manufacturers, and factory representatives, to be submitted within 30 days of notice to proceed. When received, GCPS Maintenance will release information for keying.

- C. Gwinnett County master keys shall not be provided under any circumstances. Keying information shall only be given through factory representative. All keying shall be Handled through the construction coordinator. All keys shall be sent directly to the Owner's Contract Coordinator, not to the construction site or Contractor.
- D. All mechanical and electrical room doors, main entry door and kitchen entry doors shall be provided with lockset and shall be keyed to the county maintenance master key system as well as being keyed to the school master. Exterior mechanical and electrical room doors shall be provided with mortised locksets. The interior mechanical and electrical room doors shall receive cylindrical type locksets.
- E. All classroom doors shall have locksets, including computer rooms, art, music and gym.
- F. Key all locksets into Sargent to match existing.
- G. Factory hardware keying schedule used to install lock shall be turned over to the owner at the close of the project.
- H. During construction and until the project has been turned over to the Gwinnett County School System, all doors receiving locksets shall have a temporary construction lockset using a half key construction insert, removable cores, or any other Gwinnett County School System pre-approved temporary construction lockset. The "Drop Ball" method for temporary construction locksets is not acceptable.
- I. Removable mullions shall be "Zero" keyed to "RB" Keyway.

2.2 PRODUCTS

A. HINGES

- 1. Hinges for all hollow metal doors and/or hollow metal frames shall be five knuckle full mortise type with button tips and shall be provided with machine screws for attachment to hollow metal doors and wood screws for attachment to wood doors. All hinges to be used in this project shall be produced by a single manufacturer.
- 2. All hinges used on exterior outswinging doors shall have non-removable pins.
- 3. All doors shall be hung with the quantity and sizes of hinges as specified herein. All hinges shall be installed to prevent binding.

4. All metal doors and fire rated doors shall have ball bearing hinges.
5. Hinges at interior doors shall have a US26D satin chrome finish. Hinges at all exterior doors shall have US32D finish. Hinges at interior fire rated doors shall have a US32D satin chrome finish.
6. Acceptable products shall include the following. (See hardware sets specified herein for specific applications):

MANUFACTURER	PRODUCTS
HAGER	BB1199, BB1279, 1279
McKINNEY	T4B3786, TB2714, T2714
STANLEY	FBB168, FBB179, F179

B. EXIT DEVICES

1. All exit devices shall be the product of one manufacturer and shall be listed under panic hardware in the "Accident Equipment List" produced by Underwriter's Laboratories.
2. All touch bar exit devices, where specified, shall have a reinforced decorative touch bar directing usage to the opening side of the door. All exit devices shall be operational over 67% of the clear door width.
3. Exit devices shall be attached with sex nuts and bolts on all metal doors and thru bolts on all wood doors. Finish on all exposed fasteners shall match exit devices.
4. In pairs of door installations, provide lockable removable mullions or astragals where specified.
5. All exit devices and exposed fasteners shall be 32D finish where available, parts that are not 32D shall be aluminum with 26D finish. Touch pads shall be 32D or a vinyl insert can be used on 26D plated areas. No painted or power coat finish shall be allowed.
6. All exit devices shall have full mortised strikes.
7. Lock cylinders shall be provided and installed by the General Contractor for all exit devices. See individual Hardware Sets. Cylinders shall be "RB" Keyway, "Zero" keyed. Finish on cylinders shall be US26D.
8. Acceptable products for exit device and trim include:

EXTERIOR	ACTIVE LEAF	INACTIVE LEAF
Sargent	8804 PTB	8810 PTB DT
INTERIOR	ACTIVE LEAF	INACTIVE LEAF
Sargent	713 PTB	710 PTB DT

C. LOCK SETS AND LATCH SETS

1. All lock sets and latch sets to be installed on the project shall be produced by a single manufacturer. All lock sets and latch sets

shall have matching barrier free lever handles. All lock sets and latch sets shall have a 2-3/4" backset. Latch bolts shall be hard drawn brass with a nylon anti-friction device. All lock sets and latch sets proposed for installation on fire rated doors shall be UL approved and listed.

2. Cylinders shall be provided and installed by the General Contractor for all locksets. Cylinders shall be "RB" Keyway, "Zero" keyed.
3. Finish on all lock sets and latch sets and exposed fasteners shall be US26D satin chrome plated for interior use, and US32D for exterior use.
4. Acceptable lock sets and latch sets and trim shall include the following. (See hardware sets for specific applications):

MFGR	MORTISE	CYLINDER	DEADLOCK
Sargent	8225 LNL	28-10-G05-LL	485

D. DOOR CLOSERS

1. All closers for both interior and exterior doors shall be the product of one manufacturer and shall be matched in design. Closers shall be adjustable and shall be rack and pinion construction with compressions springs. Closing speed, latching speed and back check shall be controlled by key operated valves. Delayed action feature shall be available and controlled by a separate valve. All closers shall be adjustable for minimum opening force as it applies to current barrier free code requirements. All closers shall be adjusted to provide the maximum possible opening dimension.
2. All door closers shall be overhead type, attached using thru bolts only.
3. Closers shall be sized in accordance with manufacturer's recommendations based on applicable conditions.
4. Closers shall not be installed on any classroom doors. All other fire-rated doors, including those between corridor areas, shall have closers.
5. No concealed closers shall be installed.
6. All closers shall be non-handed and non-sized. Spring power shall be adjustable for sizes 2 through 6. All closers shall be designed for handicap accessibility.
7. When closer specified includes a built-in stop, stop shall be adjustable to allow 85, 90 and 100 degrees of opening. If door opens 180 degrees, closer shall be installed and adjusted accordingly.
8. All closers shall have cast iron cylinders with back check systems.
9. Finish on all covers of closers shall be spray painted aluminum color with powder coat finish. Finish to be spray painted prior to installation.
10. No hold open devices shall be incorporated in any exterior door closer specified.

11. Acceptable closer products shall include the following. (See hardware sets for specific applications):

MFGR	EXTERIOR	INTERIOR
LCN	4041	1461
Sargent	281	1430
Yale	4400-CWF	3301

E. PLATES

- All plates proposed for installation within the project shall be produced by a single manufacturer.
- All plates shall be a minimum of 16 gauge (.050") thick and all four edges shall be beveled. Screws shall be stainless steel oval head.
- Finish on all plates shall be US32D Satin stainless steel.
- Acceptable plate products shall include the following. (See hardware sets for specific applications):

MFGR	4" x 16" PUSH PLATE	6" CTC PULL	8" KICK
Rockwood	70-C	125	K1050
Trimco	1001-3	1014-3	K0050
Quality	40	4510	48
BBW	47	5034	37
IVES	(Similar products shall be subject to architect's review.)		

F. STOPS

- All stops proposed for installation shall be produced by a single manufacturer.
- Finish on all stops shall be US32D.
- All stops shall be installed in concrete floors with expansion shields and stainless steel screws.

4. Acceptable stops shall include the following products.(See hardware for specific applications):

MFGR	INT FLOOR	EXT FLOOR	CMU WALL BUMPERS	STOP & HOLDER
Rockwood	441CU	463	411	477 WS
Trimco	1210/1212 ES	1209	1273 CCS	W 1251 S
Quality	331/431	144		Equal
BBW	F8061/ F8063	F121X	WC12X	Equal
Glynn-Johnson	FB 18S	FB18S	60C	Equal

G. DOOR SEALS

- All door seal products proposed for installation within the project shall be produced by a single manufacturer.
- Finish of exposed door seal products shall be dark bronze. Aluminum portions of door seal products shall have a dark bronze anodized finish. Thresholds shall have a mill aluminum US27 finish.
- Weatherstripping shall be screw attached. No adhesive-type or foam-type shall be permitted.
- Acceptable door seal products shall include the following. (See hardware sets for specific applications):

PRODUCTS	PEMKO	NATIONAL GUARD	REESE
Weather-stripping	303DV	160DKB	769 DVR
Thresholds:			
Porcelain Tile	158A		S514A
Carpet to VCT/CT	174A	416	S266A
Other ext doors at corridors	172A (6" min)	426E	S426A
Ext Equip Rms	181 AS	803	S488AU
Sound/Smoke Seals	303DV	320	807D
Astragals	357SP	160 DKB	
Sill Sweeps	315DN		323D

H. SILENCERS

1. Silencers from the following manufacturers shall be acceptable. (See hardware sets for specific applications):

MANUFACTURERS	SILENCERS
Rockwood	608
Trimco	1229A
Ives	Equal
BBW	Equal
Steel Craft	Equal

I. BOLTS

1. Flush bolts shall be 1" x 6-3/4" brass, rectangular front, per lengths indicated with 3/4" throw. Furnish bottom strike and top strike plate. Wrought bolts are unacceptable.
2. Bolts and accessories for use on fire-rated doors shall be Underwriters' Laboratories listed.

MANUFACTURERS	BOLTS (H Mtl Drs)	BOLTS (Wood Drs)	STRIKE
Rockwood	555	557	570
H.B. Ives Co.	Equal	Equal	Equal
Trimco	1358	ULW 3913	1226
Baldwin	Equal	Equal	Equal

J. COAT HOOKS

1. Provide and install one double coat hook with a natural aluminum finish on the inside of each classroom and workroom door. Mount hook 5'-0" AFF. Center between glazing and hinge edge.

MANUFACTURERS	COAT HOOK
IVES	BSP 582-A92
Rockwood	796
Trimco	Equal

III. PART 3 - EXECUTION

3.1 HARDWARE INSTALLATION

- A. Install finish hardware plumb, level and true to line, in accordance with manufacturer's printed installation instructions and job

conditions. Locations of hardware, where applicable, shall be in accordance with "Recommended Locations for Builders' Hardware for Standard Steel Doors and Frames."

- B. A "mock-up" installation of a typical exterior door and typical interior door shall be constructed with all applicable hardware attached for the architect's and owner's review. These "mock-up" systems shall be reviewed prior to any further installations of hardware at any door locations. "Mock-ups" may be a portion of the permanent construction.
- C. Install finish hardware using templates. Cut and fit substrate to avoid substrate damage or weakening. Cover cut-outs with hardware item. Mortise work for correct location and size, without gouging, splintering or causing irregularities in exposed finished work.
- D. Where cutting and fitting is required on substrates to be painted or similarly finished, install, fit and adjust hardware prior to finishing, then remove and place in original packaging. Re-install hardware after finishing operation is completed.
- E. Attach thresholds to concrete and other hard surfaces using lead expansion shields and 2" min. countersunk phillips head stainless steel screws to match threshold color. Thresholds shall be set in full beds of sealant and notched at each end around frame stops, applying sealant to all joints. Thresholds across double doors shall be continuous, notched around mullions and stops.
- F. The hardware manufacturer's representative shall inspect and confirm that installation recommendations and adjustments have been complied with. This applies particularly to exit devices, door closers and locksets. A Certificate of Compliance shall be submitted prior to the date of substantial completion signed by the hardware supplier and installer.

3.2 CLEANING AND ADJUSTMENT

- A. At time of hardware installation, adjust each hardware item to perform function intended. Lubricate moving parts using lubricant acceptable to hardware manufacturer. Prior to Date of Substantial Completion, re-adjust and re-lubricate hardware. Repair or replace defective materials. Clean hardware as recommended by manufacturer to remove dust and stains.
- B. Instruct Owner's designated personnel in the proper adjustment and maintenance of hardware and finishes at the time of final hardware adjustment.

- 3.3 HARDWARE SETS: Manufacturer listed first in Section 2.2 is used in Hardware Sets as basis of design.

HARDWARE SET #1 PAIR OF EXTERIOR DOORS #1, 3, 6, 40, 41
EACH PAIR TO HAVE:

6	HINGES	BB1199 NRP 4.5 x 4.5 US32D
2	EXIT DEVICES	8804 PTB (Active) 8810 PTB DT (Inactive) x SNB
1	REMOVABLE MULLION	L 980
2	CLOSERS	4041 x SNB
2	KICKPLATES	K1050 8" x 2" LDW US32D .050
2	FLOOR STOPS	463 x ES x SS Screws
1	THRESHOLD	158A x DBLDW x ES x SS Screws
1 SET	WEATHER- STRIPPING	303 DV (H, J & mullion)
2	SILL SWEEPS	315 DN x DW

HARDWARE SET #2 EXTERIOR DOORS #2, 4, 5
EACH PAIR TO HAVE:

3	HINGES	BB1199 NRP 4.5 x 4.5 US32D
1	EXIT DEVICE	8804 PTB x SNB
1	CLOSER	4041 x SNB
1	KICKPLATE	K1050 8" x 2" LDW US32D .050
1	FLOOR STOP	463 x ES x SS Screws
1	THRESHOLD	158A x DW x ES x SS Screws
1 SET	WEATHER- STRIPPING	303 DV (H, J)
1	SILL SWEEP	315 DN x DW

HARDWARE SET #3 STORAGE ROOM DOORS #12, 28
EACH DOOR TO HAVE:

3	HINGES	BB1279 4.5 x 4.5. US26D (Existing @ Door #28)
1	CYL. LOCK	28-10G05 LL US26D
1	CLOSER	1461 x TB
1	KICKPLATE	K1050 8" x 2" LDW US32D .050
1	FLOOR STOP	441
3	SILENCERS	608

HARDWARE SET #4 FILES DOOR #14, 69, 82
EACH DOOR TO HAVE:

3	HINGES	1279 4.5 x 4.5 US26D
1	CYL. LOCK	10G05-LL US26D
1	WALL STOP	411
3	SILENCERS	608

HARDWARE SET #5 TEACHER TOILET DOORS #15, 18,
80, 85

EACH DOOR TO HAVE:

3	HINGES	1279 4.5 x 4.5 US26D
1	CYL. LOCK	10U65-LL US26D
1	KICKPLATE	K1050 8" x 2" LDW X .050
1	MOP PLATE	K1050 8" x 1" LDW x .050
1	WALL STOP	411
1	COAT HOOK	796 US28
1	CLOSER	1461 x TB (Omit @ Doors #80, 85)
3	SILENCERS	608

HARDWARE SET #6 OFFICE/CONFERENCE DOORS #9, 13,
23, 50, 51, 52, 54, 56, 57, 63, 68, 72, 81,
86, 102, 103, 104, 105

EACH DOOR TO HAVE:

3	HINGES	1279 4.5 x 4.5 US26D
1	CYL. LOCK	10G05-LL US26D (Reuse existing # doors 102, 105)
1	FLOOR STOP	441 CU x ES x SS Screws (@ Doors #102, 103)
1	WALL STOP	411
1	COAT HOOK	796 US28
3	SILENCERS	608

HARDWARE SET #7 SERVER DOORS #19, 58, 60

EACH DOOR TO HAVE:

3	HINGES	1279 4.5 x 4.5 US26D
1	CYL. LOCK	10G05-LL US26D
1	DOOR STOP	411
1	CLOSER	1461 x TB
3	SILENCERS	608

HARDWARE SET #8 ELECTRICAL ROOM DOORS #24, 29, 32,
45, 79

EACH DOOR TO HAVE:

3	HINGES	BB1279 5 x 4.5 US26D (Existing @ Door #29)
1	CYL. LOCK	28-10G05 LL US26D
1	CLOSER	1461 x TB
1	WALL BUMPER	411
1	FLOOR STOP	441 CU @ Doors #24, 32
3	SILENCERS	608

HARDWARE SET #9 CLASSROOM DOORS # 46EACH DOOR TO HAVE:

3	HINGES	BB1279 4.5 x 4.5 US26D
1	CYL. LOCK	10G05-LL US26D
1	FLOOR STOP	441 CU
3	SILENCERS	608

HARDWARE SET #10 RESOURCE DOORS # 87, 89, 90, 98, 99,100, 101EACH DOOR TO HAVE:

3	HINGES	BB1279 4.5 x 4.5 US26D
1	CYL. LOCK	10G05-LL US26D
1	WALL STOP	411
3	SILENCERS	608

HARDWARE SET #11 STAIR DOORS #34, 42, 107 (60 MIN.F.R.)EACH DOOR TO HAVE:

3	HINGES	BB1199 NRP 4.5 x 4.5 US32D
1	EXIT DEVICE	8815 ETL
1	CLOSER	1461 X TB
1	KICKPLATE	K1050 1025 8" x 2" LDW US32D .050
1	WALL STOP	411

HARDWARE SET #12 EXTERIOR S. F. DOORS #35, 36, 37, 38EACH DOOR TO HAVE:

1	CONTINUOUS HINGE	SL24 HD, SEL
1	EXIT DEVICE	8810 PTB DT X TB
1	SURFACE CLOSER	4041 EDA 180 x MC x SNB, LCN
1	FLOOR STOP	FS18S, IVE
1	THRESHOLD	425, NGP
1 SET	SEALS	A626A (Jamb) x C607A (Head), NGP
1	DOOR SWEEP	C627A, NGP

HARDWARE SET #13 PAIR OF EXTERIOR DOORS #106EACH PAIR TO HAVE:

6	HINGES	BB1199 NRP 4.5 x 4.5 US32D
2	SURFACE BOLTS	555 x US32D x SNB
1	DUST PROOF STRIKE	570 x US26D
1	MORTISE LOCK	8225 LNL US32D
2	FLOOR STOPS	463 x ES x SS Screws
1	THRESHOLD	181AS x ES x SS Screws
1 SET	WEATHER- STRIPPING	303 DV (H & J's)
1	SILL SWEEP	315 DN x DW
1	ASTRAGAL	EXISTING
2	KICKPLATES	1025 8" x 2" LDW US32D .050
2	OVERHEAD HOLDERS	GJ 706 US32D x SNB
1	LATCH GUARD	180 S 32D

HARDWARE SET #14 EXTERIOR DOOR #39EACH DOOR TO HAVE:

2	CONTINUOUS HINGES	SL24 HD, SEL
1	MULLION	4954 X 2-154, VON
2	EXIT DEVICES	8810 PTB DT X SNB
2	SURFACE CLOSERS	4041 EDA 180 x MC x SNB,LCN
2	KICK PLATES	8400, IVE
2	FLOOR STOPS	FS18S, IVE
1	THRESHOLD	425, NGP
1 SET	SEALS	By Storefront Manufacturer
2	DOOR SWEEPS	C627A, NGP
1	ASTRAGAL SET	600A, NGP

HARDWARE SET #15 EXTERIOR DOOR #7EACH PAIR TO HAVE:

3	HINGES	BB1199 NRP 4.5 x 4.5
1	MORTISE LOCK	8225 LNL US32D
1	CLOSER	4041 x SNB
1	WALL STOP	411
1	THRESHOLD	181AS x ES x SS Screws
1 SET	WEATHER- STRIPPING	303 DV (H & J's)
1	SILL SWEEP	315 DN x DW
1	KICKPLATE	1025 8" x 2" LDW US32D .050
		B4E
1	LATCHGUARD	180 S 32D

<u>HARDWARE SET #25</u>		<u>EXTERIOR KITCHEN DOOR #8</u>
<u>EACH DOOR TO HAVE:</u>		
3	HINGES	BB1199 NRP 4.5 x 4.5 US32D
1	EXIT DEVICE	8804 PTB X SNB US32D
1	CLOSER	4041 x SNB
1	ARMOR PLATE	K1050 36" x 2" LDW US32D .050
1	FLOOR STOP	463 x ES x SS Screws
1	THRESHOLD	172A x DW x ES x SS Screws
1 SET	WEATHER- STRIPPING	303 DV (H & J)
1	SILL SWEEP	315 DN x DW

<u>HARDWARE SET #26</u>		<u>PAIR OF CORRIDOR (90 MIN. F. R.) DOORS #48</u>
<u>EACH DOOR TO HAVE:</u>		
6	HINGES	BB 1168 4.5 x 4.5 US26D
2	EXIT DEVICES	NB 8715 PTB X TB US26D
2	CLOSERS	1461 x TB
2	KICKPLATES	K1050 8" x 2" LDW x US32D x .050
2	WALL BUMPERS	411
4	SILENCERS	608

END OF SECTION

SECTION 08 800

GLASS AND GLAZING

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit 12" x 12" samples of each type glass specified for Architect's review.
- B. Submit manufacturer's literature indicating product descriptions and characteristics, including compliance with specified requirements and manufacturer's recommended maintenance instructions. Mark manufacturer's data to indicate only those products proposed for use.
- C. Submit shop drawings indicating locations of different glazing products.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver glass in manufacturer's protective packaging. Schedule delivery to coincide with glazing schedule.
- B. Store glass indoors in a cool, dry area off the floor, equally supported to prevent stress and breakage.
- C. Move no glass cases which have been partially unpacked.
- D. Unpack glass in accordance with manufacturer's printed instructions for type of glass being handled. Stack individual glass lites only as recommended by manufacturer.

1.3 PROJECT CONDITIONS

- A. Install glass and glazing sealants only within sealant manufacturer's recommended temperature and humidity range.

1.4 QUALITY CRITERIA

- A. All glazing shall comply with the latest edition of the Flat Glass Marketing Association's, "Glazing Manual".
- B. Tempered glass shall comply with ANSI 297.1. Each piece of glass shall be labeled by the manufacturer to indicate compliance.
- C. Glass and glazing shall comply with National Glass Association Guide to Federal Glazing Laws, and Model Glazing Code (latest editions).

- D. All glazing shall comply with requirements of International Building Code, latest edition.

1.5 WARRANTY

- A. Warrant insulating glass against obstruction to vision due to film formation or dust collection on interior glass surfaces due to seal failure, except through glass breakage. Warranty period shall be five years from Date of Substantial Completion.

II. PART 2 - PRODUCTS

2.1 GLASS

- A. Acceptable Manufacturers shall include the following:
 - 1. Oldcastle Building Envelope
 - 2. Hortis glass products
 - 3. PPG Industries, Inc.
 - 4. Guardian Industries Corp.
 - 5. Ford Glass Division
 - 6. Saint-Gobain/Euroglass
 - 7. Viracon, Inc.
 - 8. LOF Glass, Inc.
 - 9. Safti First
 - 10. Keralite
 - 11. TGP
 - 12. AGC Flat Glass NA
- B. Tempered glass shall be 1/4" thick clear glazing quality tempered in compliance with ANSI 297.1 and CPSC 16 CFR 1201. Tempered glass shall have a minimum surface compression of 10,000 psi.
- C. Fire rated glass shall have a 60 minute fire and safety rating. Acceptable products shall be SaftiFirst Super Lite 2 XL, Keralite FR-L or TGP Pyrostop. Radiant heat transfer, hose stream and heat barrier requirements shall be submitted showing Code compliance with 60 minute rating.
- D. Factory sealed insulated glass shall be two layers of 1/4" glazing quality glass separated by a 1/2" sealed air space. Air spaces shall be dehydrated at atmospheric pressure. Inside lite shall be clear. Outside lite shall be tinted gray. Install tempered glazing. Provide Kind H S (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites. Provide Kind FT (fully tempered) where safety glass is indicated. Provide Low E coating equal to PPG Solarban 60 at all exterior storefront glazing, to provide maximum 0.39 solar heat gain coefficient.

- E. Frameless mirrors shall be as specified in Section 10 001.
- F. See Glazing Schedule and contract drawings for locations of glass.

2.2 GLAZING ACCESSORIES

- A. Setting blocks shall be neoprene with an 80-90 durometer hardness. Blocks shall be 0.1" long for each square foot of supported glass area but not less than 4" long.
- B. Spacers shall be neoprene with a 40-50 durometer hardness.
- C. Glazing sealant shall be Dow Corning #795 Silicone Sealant. Color shall match window frame. Other acceptable manufacturers are Sonneborne and Tremco.
- D. Glazing tape shall be polyvinyl- chloride foam tape, ¼" thick x width equal to glazing rabbet depth.

III. PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify compliance with the following requirements prior to beginning glazing work.
 - 1. Framing shall be anchored in proper position, plumb and square within ⅛" of nominal dimensions indicated on drawings.
 - 2. Rivet, screw, bolt or nail heads and other projections shall be removed from glazing rabbets.
 - 3. Corners and fabrication intersections shall be sealed and framing shall be weathertight.
 - 4. Rabbets at sills shall weep to the outside and all rabbets shall be of sufficient depth and width to receive the glass and provide the required overlap of the glass.
 - 5. The glazier shall notify the Architect in writing of any defects prior to beginning glazing operations.

3.2 PERFORMANCE REQUIREMENTS

- A. Install glass for watertight and airtight conditions to withstand normal temperature changes and wind loading without failure of glass or adjacent construction.
- B. Protect glass edges from damage during handling and installation.
- C. Correctly size glass for each opening to ensure proper bite on glass as follows:
 - 1. ¼" bite on glass under 50 united inches
 - 2. ⅜" bite on glass between 50 - 100 united inches

3. ½" bite on glass over 100 united inches

D. Minimum bed clearance between glass and sash shall be ⅛" on both sides.

3.3 PREPARATION OF SURFACES

A. Clean glazing channel and other framing members to receive glazing immediately prior to glazing. Remove protective coatings, oil and lacquer.

B. Inspect glass immediately prior to installation and eliminate lites having edge damage or face damage.

C. Lites of tempered glass shall not be cut or otherwise altered in the field.

3.4 GLAZING PROCEDURES

A. Install setting blocks in sill rabbet at quarter points equidistant from the centerline of the glass. Size setting block length in proportion to glass weight. Minimum block length shall be 4 inches.

B. Shim lites, inboard and outboard, on all sides. Shims shall be 2" - 3" long, spaced at 24" o.c. with minimum ⅛" bite on glass.

C. Apply continuous gasket to exterior rabbet with joint at center top of frame. Notch wedge portion of gasket at corners to form neat corners. Center glass in rabbet. Apply gasket to compress miter joint into a positive seal.

D. Glaze interior channel glazing using PVC tape applied to both sides, at all stops. Accurately cut and place tape with butted joints. Compress tape approximately 30%. Center glass in rabbet.

E. Apply glazing sealants in accordance with manufacturer's printed instructions. Glazing units shall be sealed with heel bead and pin caulk to ensure water tight unit.

F. Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels) depending on light size, thickness and type of glass, and complying with manufacturer's recommendations.

G. Clean and trim excess glazing materials from the glass and stops or frames promptly after installation, and eliminate stains and discolorations.

H. Where wedge-shaped gaskets are driven into one side of the channel to pressurize the sealant or gasket on the opposite side, provide

adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail and cured heel bead.

- I. Unify appearance of each series of lites by placing panels which match one another beside each other. Inspect each piece and set with the pattern, draw and bow oriented in the same direction as other pieces.

3.5 GLAZING SCHEDULE

- A. Locate tempered glazing and wire glazing to meet all state, federal and local codes.
- B. Tempered glass shall be installed in the following locations:
 1. All non fire rated doors
 2. Interior and exterior non-rated sidelights and windows.
 3. All exterior doors
- C. 60-minute Fire and Safety glass shall be installed in the following locations:
 1. All fire rated doors and windows where required by Code
- D. Factory sealed insulated glass shall be installed at all storefront aluminum exterior windows, and shall be tempered.

3.6 PROTECTION AND CLEANING

- A. Protect glass from breakage immediately upon installation by attachment of crossed streamers to framing. Do not mark on glass surfaces.
- B. Remove and replace broken, cracked, chipped and otherwise damaged glass prior to date of substantial completion.
- C. Wash and polish glass on both faces following construction activity immediately prior to date of substantial completion. Comply with glass manufacturer's instructions for cleaning.

END OF SECTION

SECTION 09 100

METAL SUPPORT SYSTEMS

I. PART 1 - GENERAL

1.1 DELIVERY, STORAGE AND HANDLING

- A. Conform to manufacturer's printed recommendations. Store and handle products in a manner to prevent corrosion, warping, bending, and other physical damage.

1.2 CERTIFICATION

- A. Manufacturer of stud and runner system shall certify products are manufactured in compliance with ASTM C645 and ASTM A446, including requirements of all jurisdictional codes and local authorities. Submit certifications to Architect.
- B. Steel framing used to support semi-rigid materials shall be designed for an allowable deflection of $L/360$. After gypsum board is attached, any deflection or difference in ceiling height which exceeds $L/360$ of the ceiling span shall be unacceptable and the ceiling framing shall be reconstructed.

II. PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Unimast, Inc.
- B. Clark Steel Framing Systems
- C. Dietrich Industries, Inc.
- D. Southeastern Stud & Components
- E. U. S. Steel
- F. Nucon Steel
- G. Steelfast Framing Systems, Inc.

2.2 STUDS AND RUNNERS

- A. Interior Walls Per Limiting Heights Noted Below:
 - 1. Provide 250S137-33 studs at 16" o.c. up to 12'-7" with 250T125-33 track.

2. Provide 362S125-30 studs at 16" o.c. up to 15'-5" with 362T125-30 track.
3. Provide 362S137-33 studs at 12" o.c. up to 18'-5" with 362T125-33 track.
4. Provide 362S162-33 studs at 16" o.c. up to 17'-6" with 362T125-33 track.
5. Provide 362S162-33 studs at 12" o.c. up to 19'-3" with 362T125-33 track.
6. Provide 400S125-33 studs at 16" o.c. up to 17'-3" with 400T125-33 track.
7. Provide 400S162-33 studs at 16" o.c. up to 18'-11" with 400T125-33 track.
8. Provide 600S125-30 studs at 16" o.c. up to 22'-10" with 600T125-30 track.
9. Provide 600S137-33 studs at 16" o.c. up to 24'-9" with 600T125-33 track.
10. Provide 600S137-33 studs at 12" o.c. up to 27'-3" with 600T125-33 track.
11. Provide 600S162-33 studs at 16" o.c. up to 26'-0" with 600T125-33 track.
12. Provide 600S162-33 studs at 12" o.c. up to 28'-7" with 600T125-33 track.

2.3 ACCESSORIES

- A. The following accessories shall be by same manufacturer as studs and runners:
 1. Resilient furring channels shall be hat-shaped, 25 ga. x 7/8" deep galvanized steel with a 2-3/4" total width or 20 gauge x 1-1/2" with 3-1/8" total width. See plan.
 2. Cold-rolled channels shall be 16 ga. x 1-1/2" deep steel galvanized at exterior ceilings and black asphaltum painted at interior ceilings.
 3. Furring channel clips shall be 1-1/2" x 2-3/4" galvanized wire for attachment of furring channels to cold-rolled runner channels.
 4. Tie wire shall be galvanized 16 gauge soft annealed wire.
 5. Hanger wire shall be 8 ga. galvanized soft annealed wire.

III. PART 3 - EXECUTION

3.1 INTERIOR WALLS AND HEADWALLS

- A. Runners shall be aligned accurately at stud terminations and securely anchored with suitable fasteners spaced not more than 24" o.c.
- B. Studs shall be positioned vertically in the runners, and spaced no greater than 16" o.c. Anchor studs located adjacent to partition intersections and corners to runner flanges by positive screw attachment through each stud flange and runner flange. When necessary, studs shall be securely spliced with a minimum 8" nested

lap in which one screw per stud flange is required. All studs shall be screwed at both flanges to the top and bottom runners.

C. Stud Bridging Requirements

1. If gypsum board is attached to both stud flanges in accordance with Section 5.1.2, AISI 1980 Edition, with fasteners at 6" o.c. maximum, bridging is optional for erection purposes. If used for erection purposes, follow manufacturer's recommendations. If gypsum board is on one stud flange only, one row of bridging is required for studs up to 8'-0" high.
2. For studs walls with no GpDw on either flange, provide bridging at 5'-0" o.c. or per manufacturer's recommendations.
3. Bridging material shall be any channel section which fits between lips of flanges. V bridging shall be attached to both flanges.

D. Studs shall be located no more than 2" from all abutting walls and corners.

E. Provide metal stud bracing at parapet walls as shown on Drawings.

3.2 CEILING AND SOFFIT SUSPENSION SYSTEMS

- A. Provide complete suspension system including hangers, main runner channels, furring channels, tie wire and furring clips. Sizes, locations and spacings shall conform to gypsum board manufacturer's printed recommendations.
- B. Secure main runner channels to structure above with 8 gauge hanger wire spaced at 2'-0" o.c. Anchor hangers with loops at least 2" around reinforcing steel.
- C. Provide extra hangers within 6" of ends of main runners and to support light fixtures, ceiling diffusers, grilles and other items resting in or on ceilings.
- D. Locate hangers plumb in relation to main runners and to avoid contact with insulation covering ducts and pipes. Do not pass hangers through ducts. Alter spacing of hangers or splay hangers to avoid ducts and other obstructions, but do not exceed maximum allowable ceiling areas to be supported by each hanger. Offset horizontal forces of splayed hangers by counter-splaying or bracing.
- E. Locate main runners within 6" of parallel walls to support ends of cross-furring. Provide ½" clearance between channels and abutting walls. Interlock flanges and overlap ends 12" at channel splices. Secure splices with a double strand of 18 gauge wire at each end.
- F. Locate furring channels at 12" o.c. perpendicular to main runners and not more than 2" from parallel walls. Attach to main runners at end intersection with a double strand of 18 gauge wire. Provide ½"

clearance between furring channels and abutting walls. Interlock furring flanges and overlap ends 8" at splices. Secure with a double strand of 18 gauge wire at each end.

- G. Attach furring to channels with furring channel clips installed on alternate sides of carrying channel. Saddle-tie furring to channels with a double strand of 18 gauge wire when clips cannot be alternated.
- H. Provide additional ceiling framing as required to frame openings. Coordinate support framing with the work of other trades.
- I. At control joints, spaced as required by the GpDw manufacturer, provide discontinuous lap in main runners and accessories occurring over joints. Do not bridge joints with cross-furring where joints run perpendicular to furring. Where joints run parallel to furring, provide furring to support each side of joint. Locate and install control joints as recommended by GpDw manufacturer, and as located on drawings.
- J. Framing system for fire rated ceiling systems shall comply with referenced standards.

END OF SECTION

SECTION 09 260

GYPSUM BOARD SYSTEMS

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit product data which includes product descriptions, evidence of compliance with applicable codes and installation requirements. Mark manufacturer's brochures to indicate only those products proposed for use.

1.2 DELIVERY, STORAGE AND HANDLING

A. Delivery and Handling

- 1. Deliver materials to the project site with manufacturer's labels intact and legible. Handle materials with care to prevent damage. Install no materials which become damaged during handling.
- 2. Deliver fire-rated materials bearing testing agency label and required fire classification numbers.

B. Storage

- 1. Store materials inside under waterproof cover at least 6" off the floor.
- 2. Stack gypsum board so that long lengths are not over short lengths. Do not overload floor system.
- 3. Store adhesives and joint compounds in a dry area. Provide protection against freezing at all times.

1.3 PROJECT CONDITIONS

- A. Install wallboard only after building is enclosed. In cold weather, maintain a temperature of 55 degrees F to 70 degrees F for 24 hours before, during and 24 hours after gypsum board installation and joint treatment application.

B. Ventilation

- 1. Provide adequate ventilation during and following adhesive and joint treatment applications to remove excess moisture. Interior installation of gypsum products shall not commence until relative humidity in interior of building is 60% or less.
- 2. Use temporary air circulators in enclosed areas lacking natural ventilation.
- 3. Under slow drying conditions, allow additional drying time between coats of joint treatment.

1.4 QUALITY CRITERIA

- A. For all gypsum work throughout the project, provide gypsum materials, including accessories and fasteners produced by one manufacturer.
- B. All installations shall comply with fire resistance ratings as indicated and as required by governing authorities and codes. Provide materials, accessories and application procedures which have been listed by UL or tested according to ASTM E119 for the type of construction shown.
- C. Shim gypsum work as required to comply with specified tolerances. Do not exceed 1/16" offset between plates of abutting sheets (at edges or ends). Do not exceed 1/8" in 8'-0", all locations and directions, for bow or out-of-plane for plumb, level, incline or curvatures.
- D. Gypsum sheet product installations shall conform to ASTM C840: Application and Finishing of Gypsum Board. No visible defects shall be allowed in completed installation.
- E. At the time construction materials are received on site, they shall be inspected for moisture damage, and any material not completely free of moisture damage shall be rejected and replaced prior to being set into the building areas. If materials are to be stored on site prior to use in construction, they shall be stored on pallets, clearly and visibly off the ground and away from any ponding or puddling of ground water. The stored material shall further be completely protected from moisture damage with plastic sheeting, which shall be adequately vented to avoid condensation build-up. Once built into the construction, even though the building may not be dried-in, the materials shall be protected from moisture damage with plastic sheeting.

II. PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS

- A. Manufacturers listed below are intended to indicate standard of quality required. Manufacturers offering products which comply with specifications include:
 - 1. U.S. Gypsum Company
 - 2. BPB America, Inc.
 - 3. Flintkote Company
 - 4. National Gypsum Company, Gold Bond
 - 5. LaFarge
 - 6. Georgia Pacific

Note: USG products are used as the example for the remainder of Section 09 260.

2.2 GYPSUM BOARD AND SHEATHING

- A. Abuse resistant gypsum board shall be used at all wall partitions, all gang toilet and healthcare toilet ceilings and other areas where noted on drawings as "high impact". All wet area board shall also be moisture resistant. Board shall meet ASTM C1278, manufactured to resist surface abrasion and indentations. Surface abrasion shall be tested per ASTM D 4977, surface indentations per ASTM D 5420, soft body impact per ASTM C 695, and hard body impact with a swinging ram apparatus.
- B. Acceptable products shall be:
1. "USG Fiberock AR Abuse-Resistant Gypsum Panels", U.S. Gypsum Co.
 2. "Pro-Roc Abuse-Resistant Gypsum Board", Certainteed Gypsum
 3. "Hi-Abuse XP Wallboard", National Gypsum Co.
 4. "Protecta AR 100", Lafarge North America, Inc.
 5. "Touch Rock Abuse-Resistant Wallboard", G-P Gypsum Corp.
- C. Provide 5/8" water resistant abuse resistant gypsum ceiling board per Paragraph A above, in all gang toilet and healthcare toilet ceilings, for application over furring channels @ 12" o.c.
- D. Fire retardant board shall be Type X "Sheetrock" 5/8" thick with tapered edges. Type X panels shall be installed at fire rated beams, joists, walls and ceiling construction, to provide fire separation integrity at all fire rated walls. Type X gypsum panels shall comply with ASTM C36-85. See Paragraph 2.1.A for manufacturers.
- E. Exterior wall sheathing and exterior soffits and ceilings shall be glass mat faced gypsum sheathing with square edges for unexposed applications. Provide 5/8" thick sheathing for applications over framing spaced at 1'-4" o.c. Sheathing shall comply with ASTM C-79 and C-1177.
1. Acceptable manufacturers:
 - a. USG Securock Glass Mat Sheathing
 - b. BPP GlasRoc
 - c. Gold Bond e²XP Extended Exposure Sheathing
 - d. Georgia Pacific Dens-Glass Gold
- F. Gypsum shaftwall liner shall be 1" thick gypsum liner panels with square edges. Liner panels shall comply with ASTM C442. See Paragraph 2.1.A for acceptable manufacturers.

2.3 JOINT MATERIALS AND ADHESIVES

- A. Joint tape shall be equal to U.S.G. "Perf-A-Tape".

- B. Joint compound shall be equal to U.S.G. "Ready-Mixed Joint Compound", a vinyl based, ready-mixed tape embedment and topping compound for above grade use which complies with ASTM C475.
- C. Exterior joint compound shall be equal to U.S.G. "Durabond 210 Joint Compound". Finish joints in exterior gypsum ceiling board with exterior joint compound.
- D. Joints in gypsum sheathing shall be sealed with 15#/SQ. building felt installed in 6" wide strips with construction adhesive.

2.4 FASTENERS

A. Adhesive

1. Adhesive for laminating gypsum board to surfaces and in multi-layer fire rated installations shall be equal to "Durabond 90". Provide supplemental fasteners according to manufacturer's printed recommendations.

B. Screws

1. For application of single layer gypsum wall board to metal framing, provide Type S bugle head screws.
2. For application of double layer gypsum board to metal framing, provide 1-5/8" long Type S bugle head screws.
3. For application of gypsum sheathing to metal framing provide 1" long Type S-12 cadmium plated, bugle head screws.

2.5 ACCESSORIES

- A. Control Joints shall be equal to U.S.G. Control Joint #093. Provide as recommended by manufacturer.

2.6 ACCESS DOORS

- A. Provide 24" x 24" fire-rated wall access door where shown on drawings. Acceptable manufacturer: ACUDOR #FB-5060 with primed baked on enamel finish on steel. Field paint to match walls per paint specifications for metal.
- B. Unit shall be UL listed, concealed hinge, spring closer, self-latching bolt with rim cylinder lock.
- C. Acceptable equal by Milcor, J. L. Industries and Larsen's.

III. PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. Installer shall examine the supporting structure and other conditions in which gypsum products are installed and shall notify the Contractor

and Architect (in writing) of any conditions detrimental to the proper and timely completion of the work. Installer shall not proceed with the installation until satisfactory conditions have been corrected in a manner acceptable to the Architect.

- B. Install gypsum board in accordance with manufacturer's printed installation instructions, except where more stringent requirements are specified.
- C. Use gypsum board of maximum lengths available to minimize end joints. Stagger end joints.
- D. Abut gypsum board without forcing. Fit ends and edges of gypsum board. Do not place butt ends against tapered edges.
- E. Support ends and edges of gypsum board panels on framing or furring members.
- F. On exterior ceilings and soffits apply gypsum sheathing with long dimension at right angles to framing. Terminate ends and edges of gypsum board on framing or furring members. Stagger end joints over supports.
- G. Attach gypsum board using fasteners specified spaced at 8" o.c. on walls and 7" o.c. on ceilings. Begin fastening gypsum board at center and proceed toward outer edges.
- H. Double layer applications at fire rated installations
 - 1. Fasten both layers to supports with screws in accordance with manufacturer's instructions, but for base layer, do not exceed 8" o.c. maximum spacing at edges and 12" o.c. maximum spacing at intermediate supports. For face layer do not exceed 16" o.c. maximum spacing along supports.
 - 2. On walls, apply both layers vertically with vertical joints staggered on opposite side of partitions and offset not less than 12" between layers or as required for applicable fire rated U.L. listings. On ceilings, stagger all joints so that no joint occurs directly above or below another joint or as required for applicable fire rated U.L. listings.

3.2 JOINT TREATMENT

- A. Taping or embedding joints
 - 1. Apply compound in uniform layer to all joints and corners. Center tape over joint and seat tape into compound. Leave approximately 1/64" to 1/32" compound under tape to provide bond.
 - 2. Apply skim coat immediately following tape embedment but not to function as fill or second coat. Fold tape and embed in angles to

provide true angle. Allow 24 hours minimum for embedding coat to dry prior to application of fill coat.

B. Filling

1. Apply joint compound fill coat over embedding coat to cover tape. Feather out fill coat beyond tape and previous joint compound line.
2. Do not apply fill coat on interior angles.
3. Allow fill coat 24 hours minimum to dry prior to application of finish coat.

C. Finishing

1. Spread joint compound finish coat over and beyond fill coat on all joints. Feather to a smooth uniform finish.
2. Apply finish coat to taped angles to cover tape and taping compound.
3. Sand final application of compound with 200 grit silicon carbide sandpaper to provide surface ready for decoration.

D. Filling and finishing depressions

1. Apply joint compound as first coat to fastener depressions. Apply at least two additional coats of compound after first coat is dry.
2. Leave filled and finished depressions level with plane of gypsum board.

E. Finishing beads and trim

1. Apply joint compound fill coat to beads and trim. Feather out from ground to plane of the gypsum board. Allow compound 24 hours minimum to dry prior to application of second coat.
2. Apply joint compound second coat in same manner as fill coat. Extend beyond fill coat onto face of gypsum board. Allow compound 24 hours minimum to dry prior to application of finish coat.
3. Apply joint finish coat compound to bead and trim. Extend beyond second coat and feather finish coat from ground to plane of the gypsum board. Sand finish coat with 200 grit silicon carbide sandpaper to provide smooth surface ready for decoration.

F. Repair screw pops by the following process:

1. Drive new screw approximately 1-½" from unseated screw and reseal screw.
2. When face paper is punctured, drive new screw approximately 1-½" from defective fastener and remove defective fastener.
3. Fill damaged surface with joint finishing compound and sand level with plane of gypsum board.

- G. Provide control joints in ceilings and exterior soffits per manufacturer's recommendations and per drawings. Keep joints free of finishing materials. Provide ½" space at perimeter of ceiling for expansion. Seal joints with backer rod and sealant.

END OF SECTION

SECTION 09 310-G

CERAMIC, PORCELAIN & QUARRY TILE

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit product data which includes product characteristics and installation requirements. Include manufacturer's recommended installation and maintenance instructions.
- B. Samples
 - 1. Submit three (3) tiles in each proposed tile size and type specified for review.
 - 2. Submit proposed grouts as specified for review.
- C. Submit certificate signed by manufacturer and Contractor which states that the tile to be delivered shall comply with ANSI A137.1-1980 for each grade of tile specified. Submit certificate to Architect prior to delivery of tile to project site.
- D. Submit tile and grout manufacturer's written maintenance recommendations.
- E. Submit tile layout showing expansion and control joints.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver material to project site in manufacturer's original, unopened containers with labels indicating brand names, types, and colors legible and intact.
- B. Store and protect materials in accordance with manufacturer's printed recommendations.
- C. Protect tile installation from moisture, staining, cracking and other physical damage by all trades.

1.3 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 50 degrees F for 24 hours prior to commencing tile work and for 30 days thereafter in all areas to receive tile.
- B. Vent temporary gas-fired heaters to the exterior.

1.4 MAINTENANCE MATERIALS

- A. Supply extra 2% of each tile and grout used in clean marked cartons as maintenance material.

1.5 Quality Criteria

- A. Tile shall comply with ANSI A137.1.
- B. Grout shall comply with A118.1 and A118.4.

II. PART 2 - PRODUCTS

2.1 TILE

A. CERAMIC TILE

1. Furnish 2" x 2" non-abrasive ceramic tile in pre-assembled 12" x 12" squares for mud bed applications in gang toilets and for thin set application at classroom wet areas and as indicated on drawings, complete with 6" high three piece cove base of the same tile as the floor in toilets and vestibules, with bullnose tops and manufacturer's standard and interior and exterior coved corners.
2. Install 2" x 2" over 5/8" concrete tile backer board on walls of Admin toilets where shown on drawings. Provide bullnose top and edge.
3. Products shall be:
 - a. #A52 "Buff Granite" by American Olean
 - b. #D202 "Uptown Taupe Speckle" Keystones by Dal-Tile
 - c. Dotti "Light Gray" Porcelain Mosaics by Interceramic

B. PORCELAIN TILE

1. Porcelain tile shall be 12" x 12" and comply with ANSI A137.1. Grout joints to be a maximum of 1/8" wide.
2. Acceptable manufacturers and products shall be:
 - a. American Olean Tile
Series: "Terra Paver"
Colors: OW75 - "Lava Gray" (polished)
OW10 - "Mont Blanc" (unpolished)
 - b. Interceramic
Series: "Vitra"
Colors: "Antrasit" (polished)
Dotti "Light Gray Matte"(unpolished)
 - c. Dal-Tile Corporation
Series: "Minerali"
Colors: #D1006 "Absolute" (polished)
#D1008 "Mont Blanc" (unpolished)

- d. Specialty Tile Products, Inc.
Series: "Floor Gres"
Colors: "New York" (polished)
"Liverpool" (unpolished)
- e. Zumpano Enterprises, Inc.
Series: "Casa Grande Padana/Granito"
Colors: "Dakota" (polished)
"Arkansas" (unpolished)
- f. Crossville Tile
Series: "Cross-Colors"
Colors: "A850 Graphite" (polished)
"A291 Pepper Quartz" (unpolished)

C. QUARRY TILE

- 1. Furnish non-abrasive 6" x 6" unglazed quarry tile floor and 6" high base, thin set, in kitchen and adjacent areas as scheduled on floor plans, with acid resisting dark grout.
- 2. Products shall be:
 - a. #Q06 Fawn Gray by American Olean
 - b. #57X "Stone" by U.S. Ceramic Tile
 - c. #0T03 "Ashen Gray" by Dal-Tile
 - d. #505 "Plaza Gray" Quarry Basics by Metropolitan Ceramics
 - e. Crossville Tile (match Dal-Tile)

2.2 MORTARS

- A. Provide and install portland cement mortar at all thick set (mud bed) applications.
- B. Provide and install latex-portland cement mortar at all thin set applications equal to Laticrete #254 PT "Platinum".

2.3 GROUT

- A. Acceptable manufacturers and products:
 - 1. C-cure
 - 2. Upco "Hydroment"
 - 3. Upco "Standard Portland cement Type L & M Acid-R"
 - 4. AllSet
 - 5. Laticrete
 - 6. Custom Building Products
- B. Color shall be charcoal.

2.4 EXPANSION JOINTS

- A. Provide control joints over all existing expansion, control and construction joints in existing concrete slabs and at a maximum

spacing of 24' in each direction for interior tile applications. Control joints shall consist of the following product applications:

1. Sealant shall be a type M, two component urethane complying with Fed. Spec. TT-S-00227e and ASTM C920. Sealants for expansion joints in high traffic areas shall have a shore hardness of 35 or greater. Color shall match adjacent tile. Acceptable products shall include Tremco "Dymeric 511", or equal products by Dow Corning and Sonneborn.
2. Back up rod shall be a flexible, compressible, closed cell foam polyethylene or butyl rubber rounded at the exposed surface to contact sealant.

2.5 ACCESSORIES

- A. Furnish and install one piece full width, beveled, honed, Cherokee white marble saddle thresholds at all tile terminations at toilets, corridor doors, and as indicated on architectural drawings. Top of threshold shall be 1/8" inch above floor tile level. Threshold shall be 2" wide and 3/8" thick with chamfered edges. Provide 100% coverage of thin set bonding agent between threshold and substrate.

2.6 CLEANING AND PROTECTIVE MATERIALS

- A. Provide a neutral general purpose cleaner.
- B. Provide heavy duty, non-staining construction paper with compatible masking tape.
- C. Provide penetrating grout sealer.

2.7 Setting materials for thick-set flooring installations shall include the following:

- A. Type 1 portland cement shall comply with ASTM C150.
- B. Sand shall comply with ASTM-C144.
- C. Water shall be clean and potable.
- D. Mortar shall consist of 1 part portland cement to 6 parts damp sand by volume.
- E. Bond coat shall consist of latex portland cement mortar on a cured bed.
- F. Grout shall be dry set portland cement grout complying with ANSI A118.6.

- 2.8 Setting materials for thin-set flooring installations shall include the following:
- A. Dry-set mortar shall conform to ANSI A118.1
 - B. Latex portland cement mortar shall conform to ANSI A118.4
 - C. Water shall be clean and potable.
 - D. Grout shall be dry set portland cement grout complying with ANSI A118.6.
- 2.9 Setting materials for thin set base installations shall include the following:
- A. Organic adhesive mortar shall comply with ANSI A136.1.
 - B. Grout shall be dry set portland cement grout complying with ANSI A118.6.
- 2.10 CRACK BRIDGING MEMBRANE
- A. Provide self-bonding elastomeric membrane capable of heavy-duty service per ASTM C-627. Liquid applied products will not be allowed.
 - B. Primer: As required.
 - C. Furnish in 12 inch and 36 inch wide sheets in lengths required to cover cracks.
 - D. Approved Manufacturers:
 - 1. "Laticrete 9235 Waterproof and Anti-Fracture Membrane"; Laticrete International, Inc. (800-243-4788).
 - 2. "Dal-Seal TS"; Dal-Tile (800-933-Tile).
 - 3. "Strataflex Anti-Fracture Membrane"; National Applied Construction Products, Inc., (800-633-4622).
 - 4. "Nobleseal CIS Crack Isolation Sheet"; The Noble Co., (800-878-5788).
- 2.11 LEVELING COAT
- A. Leveling Coat shall be 1/4" thick or less and shall consist of dry set mortar to which an equal volume of a mixture of one part Portland Cement and 1-1/2 parts sand has been added.
 - B. Maximum variation in surface of leveling coat shall not exceed 1/8" in 8'-0" from required plane.
 - C. Leveling coat shall be cured at least 24 hours before tile is applied.
 - D. Surface to which leveling coat is to be applied shall be free of any coatings, oil, and wax.

III. PART 3 -EXECUTION

3.1 CLEANING

- A. Pressure wash all slab areas to receive tile; allow to dry partially and thoroughly inspect; correct defects:
 - 1. Correct cracks over 1/16" wide with Crack Bridging Membrane.
- B. Start tile work only when all defects are corrected.

3.2 PREPARATION

- A. Before starting tile work, examine all surfaces to receive tile. If any are found unsatisfactory, untrue, out of square, not in accordance with manufacturer's recommendations or otherwise unsuitable to receive tile notify the Architect in writing.
- B. Protect all adjacent surfaces from stains and damage during installation and curing process.
- C. Surfaces to which thin set tiles are to be applied shall be primed when required by the thin set material manufacturer.
- D. Maintain temperature in area to receive tile at 60 degrees F minimum during tile work and 7 days after completion of the tile work.
- E. Vent temporary oil and gas fired heaters to exterior.

3.3 LAYOUT

- A. Determine all locations of movement joints and accessories before starting tile work.
- B. Lay out all tile work so as to minimize cuts less than one-half in size.
- C. Locate cuts to be least conspicuous.
- D. Align all wall and floor joints to present straight, uniform, plumb and level grout lines,

3.4 SETTING METHODS

- A. At level, dry area floors installation shall comply with TA Handbook Method # F113. Tile shall comply with ANSI A108.5 and grout shall comply with ANSI A108.10.
- B. At sloping, wet area floors in toilet installation shall comply with the TA Handbook Method #F112. Tile shall comply with ANSI A108.1 and grout shall comply with ANSI A108.10.

- C. At expansion joints installation shall comply with TA Handbook Method # EJ171. See plans to define structural joint location, size and spacing.
- D. Fit tile around plumbing connections and fixtures with neat, equal width joints. Floor shall not slope excessively at toilets so that they are not level.
- E. Omit grout and caulk all inside corners with mildew-resistant silicone sealant to match adjacent materials. See Section 07 900.

3.5 CLEANING

- A. Upon completion of installation, clean soiled surfaces in manner acceptable to material manufacturer.
- B. Protect adjacent surfaces from stains and damage during cleaning. No muriatic acid shall be used.
- C. Remove all grout haze and rinse all tile thoroughly with potable water prior to and following use of chemical cleaners.

3.6 SEALING OF GROUT

- A. All grout shall be sealed with penetrating grout sealer.
- B. Protect adjacent surfaces from damage during grout sealing and clean all surfaces following sealer application.

3.7 PROTECTION FROM CONSTRUCTION DIRT

- A. Cover all tile floors with a heavy duty, non-staining construction paper masked in place.
- B. Prior to final acceptance of tile work, remove paper and rinse protective coat of neutral cleaner from all tile surfaces.

3.8 PROTECTION FROM TRAFFIC

- A. Prohibit all pedestrian and wheel traffic from tiled floors for at least 3 days, preferably 7 days following tile installation.
- B. Where traffic over tile floor is unavoidable, use large, flat boards as walkways for 7 days.

END OF SECTION

SECTION 09 510

ACOUSTICAL CEILINGS

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit product data which includes manufacturer's product descriptions, recommended installation procedures, engineering calculations, test results and maintenance recommendations.
- B. Submit the following samples for Architect's review:
 - 1. Three 1'-0" x 1'-0" samples each of acoustical tile materials
 - 2. Three 12" lengths of each suspension member.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original, unopened, protective packaging with manufacturer's labels indicating brand name, pattern, size and thickness legible and intact.
- B. Store materials in original protective packaging to prevent soiling and all forms of damage. Store cartons open at each end to stabilize moisture content and temperature.
- C. Handle materials to prevent soiling and all forms of damage.

1.3 QUALITY CRITERIA

- A. Allowable Tolerances
 - 1. Suspension system components, hangers and fastening devices supporting light fixtures, ceiling grilles and acoustical units shall have a maximum deflection of 1/360 of the span, tested in accordance with ASTM C635 and C636.
 - 2. Finished acoustical ceiling system shall be level within 1/8" in 12'-0".
 - 3. Bow, camber and twist in suspension members shall not exceed tolerances established by ASTM C635.
 - 4. All glass shall be installed and all exterior wall openings shall be covered prior to installation of acoustical ceilings. All plaster, concrete and other wet work shall be dry and complete. Temporary heat shall be provided in accordance with manufacturer's recommendations. Install acoustical ceiling panels only when normal temperature and humidity conditions approximate the interior conditions which will exist when the building is occupied.

- B. Ceiling tiles shall not be installed until all above ceiling work is complete and acceptable to the Architect.

1.4 MAINTENANCE MATERIALS

- A. Contractor shall furnish 2% of amount of acoustical ceiling tile installed for Owners use as maintenance materials.

1.5 GUARANTEE

- A. All materials and workmanship furnished under this specification shall be guaranteed in writing by their manufacturer for a period of one year from date of substantial completion against sagging and warping as a result of material or factory workmanship. Any defective materials or workmanship shall be replaced during this period without cost to the Owner.
- B. All ceiling products shall be manufactured by the same company.

II. PART 2 - PRODUCTS

2.1 SUSPENSION SYSTEM

- A. Standard and fire rated grid suspension systems shall be manufactured from commercial quality cold-rolled steel, electro-zinc coated and prefinished with a baked-on polyester white coating, for a 2' x 4' grid as shown on Architectural Finish Schedule on electrical drawings.
- B. Suspension system shall be fire rated where drawings call for fire rated acoustical tile.
- C. Main tee shall be 1-½" x 15/16" double web with bayonet couplings. 4' Cross tee shall be 1-½" x 15/16", 2' cross tee shall be 1 ¾" x 15/16". Wall Molding shall be 1" x 1". Tees and wall moldings shall comply with ASTM C635 and C636, heavy duty classifications for standard and non-fire rated ceiling systems. Tee intersections shall be override.
- D. Hanger wire shall be 12 gauge, galvanized, soft annealed, mild steel wire.
- E. Acceptable manufacturers and products for standard suspended ceiling grid systems include the following:
 - 1. Armstrong - Prelude 15/16" Exposed Tee System:
 - a. Main Beams #7301
 - b. 4' Cross Tees #7341
 - c. 2' Cross Tees #7323
 - d. wall Molding #7800

2. U.S.G DONN DX/DXL 15/16"
 - a. Main Beam DX/DXL 26
 - b. 4' Cross Beam DX/DXL 424
 - c. 2' Cross Beam DX/DXL 216
 - d. Wall Molding M7
 3. BPB, Celotex Brand, Classic Stab System
 4. Chicago Metallic
- F. Acceptable manufacturers and products for fire rated suspended ceiling grid systems include the following:
1. Armstrong - Prelude Fire Guard 15/16" Exposed Tee System:
 - a. Main Beams #8301
 - b. 4' Cross Tees #8340
 - c. 2' Cross Tees #8320
 - d. wall Molding #7800
 2. U.S.G DONN DX/DXL 15/16"
 - a. Main Beam DX/DXL 26
 - b. 4' Cross Beam DX/DXL 424
 - c. 2' Cross Beam DX/DXL 216
 - d. Wall Molding M7
 3. BPB, Celotex Brand Protectone Classic Stab System
 4. Chicago Metallic
- G. Provide radius corners at all bullnosed CMU.

2.2 ACOUSTICAL CEILING PANELS

- A. Standard acoustical ceiling panels shall be constructed of wet formed mineral fibers, non-directional, fissured. Insulation R-value shall be 1.5. Exposed surface finish shall be a factory-applied, washable, vinyl latex paint. All panels shall be $\frac{5}{8}$ " thick with an STC range of 35 to 39 and square edges. Provide panels in 2' x 4' size as indicated on electrical ceiling plans and architectural finish schedule. Surface burning characteristics shall be Class A in accordance with ASTM E1264 with a flame spread of 25 or less. Light reflectance shall be at least 75% (LR-1).

Acceptable standard acoustical ceiling panel products shall include the following:

1. Armstrong - Cortega Minaboard 769 STC 35-39
 2. BPB, Celotex Brand Baroque
 3. U.S.G Interiors Radar Climaplus #2210
- B. Fire rated acoustical ceiling panels shall match standard acoustical ceiling panel characteristics except panels shall be U.L. listed.

Acceptable fire rated acoustical ceiling panel products shall include the following:

1. Armstrong - Cortega Minaboard Fireguard with 35-39 STC (823)
2. BPB, Celotex Brand Protectone Baroque
3. U.S.G. Interiors Radar Climaplus Firecode #2215

III. PART 3 - EXECUTION

3.1 SUSPENSION SYSTEM INSTALLATION

A. Hangers

1. Space hanger wires on main tees at 4'-0" o.c. Securely attach to structure above with manufacturer - approved inserts or fasteners.
2. Install additional hangers at each corner of grid at lighting fixtures.
3. Wrap hanger wire three times, turning ends upwards.
4. Install diagonal 10 degree maximum slope wires on main runners within 8" of ends to conform to seismic restraints per ASTM E-580-96. Do not attach ceiling tees to perimeter wall angle.
5. Additional seismic or ceiling restraint details may apply. See drawings for additional details.

B. Main and Cross Tees

1. Space main tees at 4'-0" o.c.
2. Space cross tees at 2'-0" o.c. between and perpendicular to main tees. Notch and miter cross tees to form perpendicular intersection with main tees with a positive interlock.
3. Attach suspension system to adjacent vertical surfaces with mechanical fasteners at 4'-0" o.c.

C. All components of fire rated ceiling systems shall comply with U.L. designations required on drawings.

D. Provide additional ceiling hanger wires to support flexible conduit and flexible duct assemblies to avoid their contacting the ceiling tiles and/or grid system.

E. Each lay-in light fixture shall have emergency support with not less than two galvanized steel jack chains (one at each opposite diagonal corner of each light) secured to the structure above the ceiling provided for in electrical specification.

F. Ceiling suspension wires shall not be allowed to contact piping, conduit, ductwork, or other above-ceiling components. All ceiling suspension wires shall be hung from the structure (not from pipes, conduit, duct, or other supports). Provide trapezing or other types of

intermediate suspension components meeting the specified suspension system duty class as may be required to comply with the above criteria. Wire shall be wrapped three times to secure ends with wire end pointed up.

- G. All ceiling edge mould shall be installed level (or true-to-slope) as required by the drawings. All edge mould corners shall be mitered; provide pre-manufactured round corners around bullnose corner conditions. All abutting corner and end conditions shall be aligned flush along all exposed-to-view faces of edge mould. Provide caulking compound along abutment of ceiling edge molds to faces of walls (or other adjacent material conditions).
- H. All suspended ceiling systems shall be constructed with the grid centered about the space in which it is installed.

3.2 INSTALLATION OF ACOUSTICAL CEILING PANELS

- A. Install ceiling panels in level plane in straight line courses.
- B. Place materials so full perimeter bears on suspension members.
- C. Pattern shall be symmetrical about centerline or area, unless otherwise indicated on reflected ceiling plans.
- D. Where cutting of acoustical units is required, cut so that no cut or damaged edges are visible in the finished work.

3.3 CLEANING

- A. Clean soiled or discolored unit surfaces after installation.
- B. Touch up scratches, abrasions, voids and other defects in finished surfaces.
- C. Remove and replace damaged and stained units.

END OF SECTION

SECTION 09 650-G
RESILIENT FLOORING

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit product data which includes product characteristics, installation requirements and manufacturer's recommended adhesive and maintenance instructions.
- B. Submit full size samples for each type, color and pattern of flooring and accessory required.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in manufacturer's original, unopened containers with labels indicating brand names, colors, patterns and quality designations legible and intact.
- B. Store and protect materials in accordance with manufacturer's printed recommendations.
- C. Store materials in original containers at not less than 70 degrees F for not less than 24 hours immediately prior to installation.

1.3 PROJECT CONDITIONS

- A. Environmental Requirements
 - 1. Maintain temperature in space to receive resilient materials between 70 degrees F and 90 degrees F for not less than 48 hours before, during and 48 hours after installation.
 - 2. Maintain minimum temperature of 55 degrees F after flooring is installed.
- B. Protect finished flooring, base and accessories from staining, marring or other physical damage by work of other trades. Cover or mask surfaces as required.

1.4 QUALITY CRITERIA

- A. Variations in substrate shall not exceed 1/8" in 10'-0". Leveling of substrate shall be accomplished using a latex underlayment to fill in low areas.
- B. All resilient flooring shall have a flame spread rating of 75 or less when tested in accordance with ASTM E-84.

- C. All flooring shall meet requirements of governing accessibility codes.
- D. Floor slab shall be tested for moisture content per Specification 03 300 prior to installation of finish flooring materials.
- E. Flooring shall meet Federal Specification SS-T-312-B (1), Type IV, Composition 1.
- F. Flooring manufacturer shall certify that floor substrate is ready for application of resilient materials.

1.5 MAINTENANCE MATERIAL

- A. Provide 2% additional base and resilient flooring material and adhesives as maintenance material to be used by Owner in manufacturer's original, sealed packaging.

1.6 GUARANTEE

- A. Flooring manufacturers shall guarantee that flooring shall be free from defects in materials and workmanship for a period of one year from Date of Substantial Completion.

II. PART 2 - PRODUCTS

2.1 VINYL COMPOSITION TILE (VCT)

- A. Acceptable tile manufacturers and products for storage rooms and file rooms tile include:
 - 1. Armstrong World Industries - Excelon Imperial #51911 "Classic White".
 - 2. Azrock Industries - Custom Cortina #V-862 "Cloud White".
 - 3. Tarket - #1318 "White/Black"
 - 4. Congoleum #CH-12 "Stone White"
- B. All other tile shall be:
 - 1. Azrock "Rainbow" #V-781
 - 2. Tarkett #1320 "Refined White Multi"
 - 3. Mannington Commercial #401 "White Multiflec"
 - 4. Congoleum #AL-80 "Light Berry Blossom"
 - 5. Armstrong Standard Excelon #52500 "Carnival White"
- C. Vinyl composition tile characteristics
 - 1. Size shall be 12" x 12" x 1/8" thick.
 - 2. Tile shall have a satin smooth surface with nondirectional graining.
 - 3. Tile shall have a 50 psi load limit.

4. Tile shall have thru-color construction.
5. All tile shall be from the same factory run for each color selected.

2.2 ACCESSORIES

- A. All areas shall receive 4" rubber cove base, matte black in color. Base shall be provided in 4'-0" lengths and shall be installed using matching end stops and factory preformed outside corner units.
- B. Acceptable accessory manufacturers shall include the following:
 1. Flexco Division/Textile Rubber Company
 2. Johnsonite Rubber Company
 3. F.C. Musson Rubber Company
 4. Roppe Rubber Corp.
 5. Allstate Rubber Company
 6. Armstrong
 7. Azrock

2.3 APPLICATION MATERIALS

- A. Install all VCT with epoxy adhesive.
- B. Provide and apply types and brands of adhesive recommended by material manufacturer for type of material and installation.
- C. Provide and apply waxes and cleaners recommended by floor tile manufacturer for the particular type of material and installation.
- D. Protect circulation paths with heavy brown paper.

III. PART 3 - EXECUTION

3.1 PREPARATION

- A. Before beginning operations, installer shall examine the substrates that are in connection with the work included in this Section and shall notify the Contractor and Architect, in writing, of any defects which he considers detrimental to the completion of work according to these Specifications.
- B. The installer shall be held responsible for blemishes "telegraphing" through the tile and shall correct all such defects.
- C. Remove dirt, oil, grease or other foreign matter from surfaces to receive floor covering and accessories. Vacuum substrate prior to tile installation.

- D. Prime surfaces as recommended by resilient flooring and adhesive manufacturer.

3.2 APPLICATION OF ADHESIVES

- A. Mix and apply adhesives to substrate with notched trowel or other tools in accordance with manufacturer's printed instructions.
- B. Provide adequate ventilation and other safety precautions during mixing and application of adhesive as recommended by adhesive manufacturer.
- C. Apply adhesive only to that area which can be covered by resilient material within the recommended working time of the adhesive.
 - 1. Remove adhesive which dries or films over.
 - 2. Do not soil walls, bases or adjacent areas with adhesives.
 - 3. Remove spilled or misplaced materials.

3.3 INSTALLATION OF TILE MATERIALS

- A. Lay tile from center of area to receive it, working toward perimeter.
- B. Cut corner tile to fit within 1/32" of abutting surfaces.
- C. Fit flooring material into recesses, against bases, around pipes and penetrations, under saddles and thresholds and around built-in cabinets and equipment.
- D. Lay adjacent tiles with grain or pattern running in same direction at adjacent tiles.
- E. Tile shall be laid out to eliminate slivers less than 6" wide.
- F. Tile shall be installed in strict compliance with manufacturer's written instructions.
- G. Tile terminations at doors shall be under the doors.

3.4 INSTALLATION OF ACCESSORIES

- A. Workmanship
 - 1. Install base with tight butt joints with no joint widths greater than 1/64".
 - 2. Base shall be set plumb, level and straight with a full backing of adhesive.

B. Top-set base

1. Apply adhesive and adhere base to wall surfaces.
2. Press down so that bottom cove edge follows floor profile.
3. Form internal corners using pre-molded rubber base material.
4. Form external corners by using premolded material.
5. Scribe base to abutting materials.

3.5 CLEANING AND FINISHING

- A. Upon completion of resilient floorings and accessory installation, clean surfaces using a neutral cleaner acceptable to material manufacturer.
- B. Protection: The General Contractor shall protect the finished floor from the time the contractor completes the work until final inspection. Cover all floors with heavy-duty, non-staining construction paper taped in place.

END OF SECTION

SECTION 09 685-G

CARPETING

I. PART 1 - GENERAL

1.1 SCOPE

- A. This section includes provision and installation of carpet including tools, equipment, metal moldings, carpet, pad, edging strips, adhesives and all necessary trim pieces and installation accessories.
- B. Carpet shall be installed in classrooms and offices using approved adhesives and installation procedures and techniques according to manufacturer's recommendations.
- C. The carpet manufacturer shall be directly responsible to the General Contractor for each project regarding schedule, payment and quantities for all carpet and installation.
- D. See Paragraph 2.1.B for purchasing information.

1.2 SUBMITTALS

- A. Submit manufacturer's certification to indicate compliance with the following requirements:
 - 1. A maximum of ninety days prior to delivery of carpet, the carpet manufacturer shall submit a certificate containing a complete listing of materials and construction of the fabric he proposes to furnish and certified copy that carpet meets all flammability requirements listed in 2.1.A.19. No fabric may be shipped until the Architect has reviewed the construction materials and certified fire test. Test reports shall be submitted from an independent laboratory indicating compliance with the fire test requirements. Carpet shall be Class "A" with a flame spread rating of 0 - 25.
 - 2. In addition, the carpet manufacturer's certificate shall contain the following statement: "The carpet manufacturer further agrees that should test of actual fabric shipped not come up to the standard specified, the carpet manufacturer will furnish new fabric meeting these specifications and pay all cost of shipping, installation and all other incidental charges necessary to install the specified materials."
 - 3. Samples shall be accompanied by maintenance procedures, maintenance materials, and cleaning

schedule and procedures. List of all materials and substances which may affect carpet finish and performance shall also be provided.

4. Each sample shall be accompanied by an affidavit from the carpet manufacturer that flame spread, fuel contributed, and smoke factor meet specification requirements. Tests shall be performed in a laboratory acceptable to the State Fire Marshall.
- B. Submit 1'-0" x 1'-0" samples of each color proposed carpet and a 1'-0" long sample of carpet edge strip.
- C. A seam layout shop drawing shall be submitted which diagrams the location of all cuts, seams, metal edge strips and other installation details. No carpet shall be installed until written acceptance has been received.
- D. Submit 3 copies of a complete printed installation manual with the manufacturer's installation and maintenance recommendations for the proposed carpet. Materials necessary for Owner maintenance shall be listed by manufacturer's trade names and number to adequately identify products. Instructions shall be followed explicitly.
- E. A carpet color legend shall be submitted listing each room numerically with the associated carpet color proposed for installation within each room.
- F. Submit all warranties for review. See Part 1.7 in this section.
- G. Carpet Manufacturer shall furnish three copies of reports of test results by an independent testing laboratory of tests made for each of the performance criteria herein listed. The Owner, at his option, may order additional tests made on any portion of furnished fabric for conformance with his criteria. These tests, if ordered, will be at the expense of the Owner if material is compliant with specifications. If material is non-compliant with specifications, the Carpet Manufacturer will bear all testing costs.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Store carpet in a well ventilated place, protected from dirt, damage, stains, moisture and vandalism. Temperature and humidity conditions of building shall be in accordance with the carpet and manufacturer's recommendations.
- B. Schedule carpet delivery to avoid long term storage on the site.
- C. A written record of received goods shall be submitted to the Architect.

- D. The non-staining reinforced building paper used for protecting the carpet is not included in the unit price agreement between the supplier and Gwinnett County Public Schools. If building paper is required to protect installed carpet areas, it is the responsibility of the general contractor to provide and install.

1.4 PROJECT CONDITIONS

- A. Areas to be carpeted shall be clean, dry and all construction shall have been completed. Store materials in proposed area for 36 hours prior to installation to achieve temperature stability. Maintain 70° F minimum ambient temperature 3 days prior to, during and 24 hours after carpet installation.
- B. If required by the carpet manufacturer's installation recommendations, apply a concrete sealer compatible with carpet and adhesives on concrete substrates to receive carpet.
- C. Do not install new carpet over defective surfaces. Beginning carpet installation shall be construed as the installers acceptance of the existing substrate and conditions of the work. The carpet installer shall report in writing to the Architect any condition which will prevent a satisfactory carpet installation.
- D. The Carpet Manufacturer shall be fully responsible for the installation and condition of the carpet until date of final completion.

1.5 QUALITY CRITERIA

- A. The Carpet Manufacturer's installer shall relay and restretch any carpet that does not provide an attractive wrinkle free appearance and shall correct any condition due to faulty workmanship.
- B. Carpet manufacturer will provide the services of their technical service representative at the job site at the beginning of installation to assist and demonstrate proper installation procedures to the installer.
- C. Installation shall be by people skilled in carpet installation and supervised by a recognized supervisory foreman. Foreman shall supervise and coordinate the entire installation and shall not be considered as an installer.
- D. Starting of work of this section shall be construed as the installer's acceptance of the existing substrates and conditions of the work.
- E. All carpet shall be first quality of domestic manufacture and shall be constructed using a totally vertical manufacturing process, with

the exception of yard extrusion. Carpet manufacturer shall have a minimum of 10 years commercial carpet manufacturing experience. All yard shall be of domestic origin.

- F. At the time of delivery to a project the manufacturer shall certify by register and roll numbers that the carpet complies with all requirements of this specification.
- G. Carpet shall comply with the following test reports:
- | | | |
|-----|---------------------------------|--|
| 1. | Average Pile Yarn Weight | ASTM D-418 D-5848 |
| 2. | Pile Thickness/Tuft Height | Penetrator Gauge
ASTM D-418/ASTM D-5823 |
| 3. | Total Weight | ASTM D-5848 |
| 4. | Tufts Per Square Inch
or SPI | ASTM D-5793 |
| 5. | Pile Fiber Identification | AATCC 20A |
| 6. | Electrostatic Propensity | AATCC 134 - Less than 3.0 Kv |
| 7. | Flammability | |
| | a. Methenamine
Tablet Test | ASTM D2859-707 |
| | b. Flooring Radiant
Panel | ASTM E 648 |
| | c. NBS Aminco Smoke
Density | ASTM E662/AATCC 23 |
| 8. | Colorfastness to Light | AATCC 16, Option E |
| 9. | Colorfastness to Crocking | AATCC 165 |
| 10. | Atmospheric Fading | AATCC 129 (ozone)
AATCC 23 (burned gas) |
| 11. | Tuft Bind | ASTM D-1335 |
- H. Floor slab shall be tested for moisture content per Specification 03 300 prior to installation of finish flooring material.

1.6 MAINTENANCE MATERIALS

- A. All carpet scraps shall remain at jobsite for Owner's review. Selected carpet scraps shall be stored in the project for future repairs. Remaining scraps shall be disposed of by the Installer. In addition, the Carpet Installer shall provide the Owner 3 square yards of each type/color of carpet specified for Owner's maintenance materials. All carpet shall be from the same dye lot as the installed material.

1.7 GUARANTEES

- A. The carpet manufacturer shall unconditionally guarantee in writing that the carpet he proposes to furnish meets or exceeds in every detail the requirements for material herein specified and that all materials shall be of first quality and guaranteed against defects in workmanship and material.

- B. The Carpet Manufacturer shall unconditionally guarantee in writing the installation as outlined under the execution section of this specification, and that any service required to correct either material or installation as outlined in this specification shall be performed by the carpet manufacturer's installer at no charge for a period of two years from date of substantial completion, and shall further guarantee in writing for five years from date of substantial completion against not more than 10 percent surface wear on a non-prorated basis for both material and labor.
- C. Both the guarantees outlined above shall be submitted to the Architect for review with his original bid.
- D. Yarn manufacturer shall provide the following written guarantees:
1. 10 year color fastness guarantee
 2. 5 year guarantee against damage due to atmospheric contaminants
 3. Lifetime guarantee against static buildup (3.0 Kv or less as tested under AATCC-134).
 4. 10-Year Wear, 10-Year Edge Ravel/Zippering Warranty
 5. 20 lb. Tuft Bind Warranty
- E. The manufacturer shall warrant that the carpet will not cause static or induce malfunction of electronic equipment when installed throughout the equipment operating area.
1. Remedy of claims under this warranty if found valid, shall include the engaging of a qualified installer to replace the carpeting in the static affected area with new materials having adequate static control properties, at no cost to the Owner for materials and labor, except that moving, replacing, disconnecting and reconnecting of equipment if not include herein.
 2. Static is defined as the electrical charge built up and later discharged from a person, cart or other objects as a result of movement of that person or object upon the floor covering.
 3. Malfunction is defined as any failure of the electronic equipment caused by carpet induced static electricity, provided the equipment is operating within specifications in every other respect.
 4. Electronic equipment is any computer, word processor, terminal, or other peripheral component, communications processor, typesetter or broadcast equipment sold by a recognized manufacturer (or its authorized distributor, agent, or representative) and installed and serviced by qualified personnel.

II. PART 2 - PRODUCTS

2.1 CARPET

A. Carpet shall be equal to or better than the following minimum specifications as certified by independent test reports:

1. Tufted level loop
2. Face yarn - 100% solution dyed nylon.
3. Finished pile weight - 28 oz. per square yard.
4. Face weight - The ounces per square yard shall not be more than one-half ounce under the specified amount
5. Dye method - solution dyed only
6. Special treatments - Fluorochemical
7. Pile height - .156
8. Gauge - $\frac{1}{8}$
9. Stitches per inch - 7.3
10. Tufts per square inch - 58.4
11. Primary backing - polypropylene
12. Secondary backing - unitary - Delamination Strength = 2.5 pounds of force per inch, minimum average value.
13. Yarn ply - 5
14. Denier - 1200/5
15. Density - 6,000
16. Weight density factor - 156,000
17. Total weight - 63 ounces per square yard
18. Width shall be not less than 12 feet
19. Flammability Rating: (Critical Radiant Flux)
 - a. Flooring Radiant Panel Class 1 (ASTM E 648)
 - b. NBS Aminco Smoke Chamber Test - Specific Optical Density of 450 or less (ASTM E 662 Flaming Mode)
 - c. Surface Flammability - FF1-70 as found in 16 CFR 1630 and ASTM-D-2859 (Methenamine Pill Test)
20. Colorfastness to Light - Rating of not less than 4 after 40 AATCC fading units using AATCC gray scale for color change.
21. Colorfastness to Crocking - Rating of 4 minimum, wet and dry, using AATCC color transference scale.
22. Atmospheric Fading - Burned Gas shall not be less than 4 on International Grey Scale after two cycles on each test (AATCC Test Method 129 Ozone/AATCC Test Method 23).
23. Yarn must be twisted and heat set or air entangled. No single step or straight down yarn processing accepted.
24. Tuft bind shall resist 20.0 pounds of force (for loop pile only) min. average value.

B. Acceptable carpet manufacturers shall include the following:

1. Carpet and adhesive material shall be as manufactured and installed by Mohawk Commercial Group at a fixed

price of \$11.95 per square yard. Pricing for materials and installation shall be provided to all general contractors by manufacturers representative :

- a. John Cummings
4644 Karls Gate Drive
Marietta, GA 30068
770-841-4598 Cell
john_cummings@mohawkind.com

C. All colors shall be # KB4 "Rust".

D. Carpet Accessories

1. Adhesives shall be water-based waterproof cement as recommended by carpet manufacturer. Such recommendation must be in writing on the letterhead of the carpet manufacturer.
2. Seam sealer shall be used on all carpet seams.
3. Threshold at intersection of carpet and tile shall be National Guard Threshold #NGP 416 or equal by Pemco or Reese, installed with stainless steel screws in lead anchors.

III. PART 3 - EXECUTION

3.1 CARPET INSTALLATION

- A. Concrete floor slab to receive carpet shall be thoroughly dry, vacuumed, free of droppings, wax, grease, oil, paint, varnish, hardeners, cement, moisture and any other material which would interfere with adhesion of carpet adhesive. Starting of work shall be construed as the Carpet Manufacturer's acceptance of the surface and the conditions of the work. The carpet manufacturer shall report in writing to the Owner, any conditions which will prevent a satisfactory carpet installation.
- B. Carpet shall be installed according to the carpet manufacturer's recommendations, using approved adhesives and installation procedures and techniques.
- C. Carpet Installation
 1. Remove substrate ridges and bumps. Fill low spots, cracks, joints, holes, etc. with premixed latex filler.
 2. Cut and fit sections of carpet for each space prior to adhesive application.
 3. Butt carpet edges and seams tightly, rolling to ensure uniform bond and elimination of air pockets.
 4. Standard seamless broadloom widths shall be used unless the size required necessitates seaming. All seaming shall be indicated on reviewed layout drawings.

- Cross seams required due to lengths of carpet rolls received shall be placed to avoid occurrence at conspicuous locations, near doors and perpendicular to doors and entries. Seams occurring at doors which are parallel to the doors shall be centered directly under the door. Seams occurring at corridor change or direction shall follow the wall line parallel to the carpet direction.
5. Lay out in plan the area to be carpeted. Check the plan against the available dye lot numbers and roll lengths to minimum cross seaming.
 - D. Verify carpet match before cutting to ensure minimum variation between dye lots.
 - E. Lay carpet on floors with run of pile in same direction as anticipated traffic.
 - F. Do not change run of pile in any room where carpet is continuous through a wall opening into another room. Locate change of color or pattern between rooms under door centerline.
 - G. Cut and fit carpet around interruptions.
 - H. Fit carpet tight to vertical interruptions, leaving no gaps.
 - I. Exposed edges and ends of carpet occurring at doorways, fixed frames and sidelights not covered by base, openings and dissimilar floor finishes shall be terminated with aluminum edging unless noted otherwise. Install with neat mitered corners.
 - J. Carpet shall be installed wall to wall, using continuous lengths in principal areas and as broad widths as possible to minimize the placement of seams in other traffic lanes. Cut edges shall be trued and treated to form invisible and non-raveling joints where exposed. Seaming work shall not be less than 12' o.c., except at one end to work out the dimension.
 - K. Carpeting and joint seams shall be cleaned of all dirt, stains and adhesive.
 - L. Carpeting shall be protected with non-staining reinforced building paper masked into place after carpet installation.
 - M. All seams shall be rolled and sealed with an edge sealer to ensure uniform bond. Edge sealer shall be installed on edges of primary backing.
 - N. Vacuum carpet with a commercial machine, with rotating agitator or beater in the nozzle. Remove soiled spots. Shampoo if required by the Architect to clean carpet. Protect circulation paths with heavy brown paper.

- O. Mill will provide a competent employee, no subcontractors, as a single point of contact for all product information, installation support and after sales service.
- P. Carpet manufacturer will have employee representative, along with installation support, at project site within 48 hours of call for all potential claims. All repairs must begin within 72 hours of that visit.

END OF SECTION

SECTION 09 900-G

PAINTING

I. PART 1 - GENERAL

1.1 SCOPE

A. Work described in this section includes the following:

1. Touching up of shop-applied prime coats.
2. Preparation of surfaces to receive painted or stained finishes.
3. Priming and backpriming of finish carpentry.
4. Painting, staining or otherwise finishing of all surfaces, except as otherwise indicated.
5. Painting all existing and new hollow metal frames and doors in Phase 3D.

1.2 SUBMITTALS

A. Product Data

1. Submit a complete list of products proposed for use at least 30 days prior to commencement of painting work.
2. Indicate manufacturer, brand name, quality and product type for each surface to be finished.
3. Intent of Contractor to use products specified does not relieve him from responsibility of submitting a product list.

B. Submit two sets of full range color samples from manufacturers proposed for use for color selections by Architect. Submit 8-1/2 x 11 color sample of actual paint for each finished paint type and color.

1.3 DELIVERY, STORAGE AND HANDLING

A. Delivery

1. Deliver materials to project site ready-mixed in original containers with labels intact.
2. Provide legible labels bearing manufacturer's name, product type, color and recommended installation and reducing procedures.

B. Storage and Handling

1. Store materials in location acceptable to the Owner to prevent all forms of damage to materials. Protect material from severe temperature extremes.

2. Maintain neat, clean conditions in storage area. Remove rags, empty cans, waste rubbish and similar materials from the site at the end of each day's work.
3. Close all material containers at end of each day's work.
4. Painting contractor shall be liable for damage to surrounding areas.

1.4 PROJECT CONDITIONS

A. Environmental Requirements

1. Comply with manufacturer's recommendations regarding environmental conditions under which materials may be applied.
2. Apply no materials in spaces where dust is being generated.

B. Cover finished work of other trades prefinished items and surfaces not being painted concurrently.

C. Safety Precautions

1. Provide temporary fire protection equipment in materials storage area.
2. Smoking shall be prohibited in material storage area and during application.

D. Products shall not be modified in any manner on the job site by the installer.

1.5 MAINTENANCE MATERIALS

- A. Provide one unopened gallon of each type and color of all products used on the project for the Owner's use in future maintenance operations.

II. PART 2 - PRODUCTS

2.1 PAINTING MATERIALS

- A. Materials specified shall provide the coating types and set a standard of quality from the top line of materials by the following acceptable manufacturers:

1. Porter Paints
2. Sherwin Williams Company
3. Duron Paints
4. ICI-Dulux
5. Pittsburgh Paints
6. Benjamin Moore

- B. Where products are specified as a standard of quality in the product schedule, such products have been selected in accordance to their

binders or vehicles to achieve specific results. Substitutions shall be allowed only with Architect's review.

C. Miscellaneous Materials

1. Paint thinners and tints shall be products of same manufacturer as paints or approved by paint manufacturer for use with their products. Tinting shall be done by supplier. Material shall not be modified in any manner on the job.
2. Shellac, turpentine, patching compounds and similar materials required for execution of work shall be pure, best quality products.

D. Product colors shall match Gwinnett County Public School System's standard colors.

E. No paint shall contain more than 6/10 of one percent lead content by weight.

F. Putty shall be pure, linseed oil-whiting putty complying with Federal Specification TY-P791a, Type 1. Acceptable manufacturers shall be Dicks-Armstrong-Pontius Company, or Pecora, Inc., Tremco Manufacturing Company and U. S. Gypsum. Putty made with cottonseed oil will not be acceptable. Exterior putty shall be job-mixed consisting of 5 percent by weight white lead paste or 10 percent white lead-whiting putty in compliance with Federal Specification above, Type II.

G. Filler for open grade woods shall be a pure, silica-based filler in thin paste form, capable of mixing with wood stains specified. After application and drying period, the filler shall be non-absorbent and non-shrinking.

2.2 PAINTING COLORS

A. Formula for interior wall paint colors shall be Sherwin Williams:

WHITE CLIFFS CUSTOM SHER-COLOR MATCH				
BAC COLORANT	OZ	32	64	128
B1-BLACK	-	-	1	1
N1-RAW UMBER	-	14	-	1
Y3-DEEP GOLD	-	-	1	-

B. Painted ceilings in gang toilets shall be white.

- C. Formula for hollow metal door and window frames shall be Sherwin Williams:

GWINNETT NIGHT BROWN CUSTOM MANUAL MATCH				
BAC COLORANT	OZ	32	64	128
B1-BLACK	4	62	-	-
R2-MAROON	-	22	-	-
W1-WHITE	-	50	1	-
73-DEEP GOLD	2	3	1	1

- D. Wood stain color shall be equal to "Fruitwood" by Minwax.
- E. Approved manufacturers include Sherwin Williams, Porter, ICI-Dulux, Duron, Pittsburgh and Benjamin Moore. Paint products by these manufacturers shall match the basis of design colors. Color samples shall be submitted and approved.

2.3 PRODUCT SCHEDULE

- A. Concrete Masonry Units with Semi-Gloss Enamel (Classroom, Administrative Areas, Work Rooms, Storage Rooms):
1. Application
 - a. One Coat - Block filler at CMU (Apply filler coat at a rate to ensure complete coverage with pores filled.)
 - b. Two Coats (Minimum) - Semi-gloss latex enamel (1.5 mils DFT each coat).
 2. Products
 - a. Porter: ProMaster 2000 Latex Block Filler, #6223
ProMaster 2000 Latex Semi-Gloss, #6139
 - b. Sherwin Williams: Pro-Mar Interior/Exterior Block Filler, B25 W 25
Pro-Mar 200 Latex Semi-Gloss Enamel, B31 W 200 Series
 - c. Duron: Block Kote Latex Block Filler, 08-128
Ultra Deluxe Interior Vinyl Acrylic Semi-gloss Enamel, 35 Series.
 - d. Dulux: ULTRA-HIDE Acrylic Latex Block Filler, #3010
1406 Dulux Professional Acrylic Latex Semi-Gloss Enamel
 - e. Pittsburgh: SpeedHide Latex Block Filler #6-7
SpeedHide Latex Semi-Gloss Enamel #6-500
 - f. Benjamin Moore: Super Craft Acrylic Latex Block Filler #285
Super Spec Acrylic Latex Semi-Gloss Enamel #276

- B. Concrete Masonry Units with Epoxy Paint (Corridor Walls, Toilet Rooms, Kitchen Areas, Custodian's Closets and Lab Walls):
1. Application
 - a. One Coat - Heavy duty waterproofing block filler (Apply filler coat at a rate to ensure complete coverage with pores filled.)
 - b. Two Coats (Minimum) - High build high gloss, two part, chemically-cured, epoxy resin (4.0 mils DFT each coat).
 2. Products
 - a. Porter: BlocLoc #222 Waterproofing Block Filler
DuraGlaze WB Polyamide Epoxy Gloss #9371 (4-5 mils total DFT per coat)
 - b. Sherwin
Williams: Epo-Plex Cementitious WB Epoxy Block Filler B70-300
WB Tile Clad Epoxy, B73-100 Series
 - c. Duron: Dura Crete Solventborne Waterproof Cement
Fortified Filler Coat, 16-410
Dura Clad 800 High Build Epoxy, Gloss, DU
1X08000 Series
 - d. Dulux: BLOX-FIL Acrylic Block Filler #4015
4408 Tru-Glaze Waterborne Polyamide Gloss Epoxy
 - e. Pittsburgh: #95-217 Pittsburgh Paints Cementitious Block Filler,
95-217
Aquapon WB Water Based Epoxy Gloss #98-1.
 - f. Benjamin
Moore: Insix Waterbloc Acrylic Blockfiller
I.M.C. Waterborne Polyamide Epoxy Gloss Coating
#M-42
- C. Gypsum Drywall
1. Application
 - a. One coat primer sealer
 - b. Two coats latex semi-gloss enamel at walls, ceiling headwalls, dropped beams.
 2. Products
 - a. Porter: 867 ProMaster 2000 Latex Drywall Primer
6129 Pro Master 2000 Latex Eggshell Enamel
 - b. Dulux: 3210 Gripper Acrylic Sealer
1406 Dulux Professional Acrylic Latex Eggshell Enamel
 - c. Sherwin
Williams: B28W200 Prep-Rite 200 Latex Primer
B20 ProMar 200 Acrylic Latex Eggshell Enamel
 - d. Duron: 04-126 Latex Drywall Primer
36 Series Ultra Delux Acrylic Latex Eggshell Enamel
 - e. Pittsburgh: SpeedHide Interior Latex Sealer, #6-2
Speed Hide Latex Eggshell Enamel, #6-411

- f. Benjamin
Moore: Super Spec Acrylic Latex Undercoater Primer
Sealer #253
Super Spec Acrylic Latex Eggshell Enamel #274
- D. Ferrous Metal: (Includes door/window framing; exposed building structures, including exposed columns, beams, trusses, bracing, deck; exposed piping and conduit; exhaust vent caps on building face; interior door view lite frames, galvanized handrails and guardrails:
1. Application
 - a. One Coat - Rust Inhibitive alkyd primer (except exhaust air heat recovery units which shall be furnished with prime coat.
 - b. Two Coats - (Minimum) - Gloss alkyd industrial enamel (1.5 mils DFT each coat)
 2. Products
 - a. Porter: PorterGuard Alkyd Metal Primer #272/276
PorterGuard Alkyd Gloss Enamel, #2700 Series
 - b. Sherwin
Williams: KEM KROMIK Universal Metal Primer, B50 Z Series, B54 Series Industrial Enamel
 - c. Duron: Dura Clad Alkyd White Metal Primer, 33-010
Dura Clad Alkyd Gloss Enamel, 12 Series
 - d. Dulux: DEV-GUARD Structural Primer, #4160
DEV-GUARD Alkyd Industrial Enamel, #4308 Series
 - e. Pittsburgh: SpeedHide Alkyd Rust Inhibitive Primer #6-208
SpeedHide Oil Gloss Enamel #6-282
 - f. Benjamin
Moore: I.M.C. Rust Inhibitive Alkyd Metal Primer #M-06
I.M.C. Urethane Alkyd Gloss Enamel #CM-22
 3. Remove passivator from all galvanized products prior to application of initial coat of paint.
- E. Transparent Finish Woodwork:
1. 1st Coat - Ultra Hide oil wood stain
 2. 2nd Coat - Quick Dry sanding sealer
 3. 3rd Coat - Urethane satin sheen varnish
 4. 4th Coat - Urethane satin sheen varnish
- F. Painted Woodwork
1. Application
 - a. 1st Coat - Enamel undercoat
 - b. Two coats (minimum) Alkyd Semi-Gloss Enamel
 2. Products
 - a. Porter: 6064 ProMaster 2000 Alkyd Enamel Undercoat
149 ProMaster Alkyd Semi-Gloss Enamel
 - b. Dulux: 1120 Ultra-Hide Alkyd Enamel Undercoat
1516 Ultra-Hide Alkyd Semi-Gloss Enamel

- c. Sherwin
Williams: PrepRite Wall/Wood Primer B49 Series
ProMar 200 Alkyd Semi-Gloss Enamel B34W200
 - d. Duron: 04-024 Wall Kote Alkyd Enamel Undercoat
43 Series Duron Everlast Alkyd Semi-Gloss
Enamel
 - e. Pittsburgh: 6-6 SpeedHide Alkyd Enamel Undercoat
6-110 SpeedHide Alkyd Semi-Gloss Enamel
 - f. Benjamin
Moore: Super Spec Alkyd Enamel Undercoat #C-245
Super Spec Alkyd Semi-Gloss Enamel #C-271
- G. Interior Concrete Floors (Sealed): (Porter products used as models)
(Includes mechanical rooms, electrical rooms, custodial rooms)
- 1. Floor shall be acid etched with muriatic acid solution prior to application.
 - 2. First Coat: 3201 Plex-Seal clear acrylic masonry finish thinned 25 percent.
 - 3. Second Coat: 3201 Plex-Seal clear acrylic masonry finish (full strength).
 - 4. **NOTE:** Apply sealer OVER painted lines.
- H. Exterior Speakers specified in Section 16 300 shall receive 2 finish coats of enamel paint prior to installation by electrician. Color to be selected by Architect.

III. PART 3 - EXECUTION

3.1 SURFACE PREPARATIONS

- A. Surfaces to receive finishes shall be dry and free of debris, oils, dust and other deleterious materials.
- B. Lumber, Plywood and Veneered Wood Surfaces
- 1. Apply shellac to knots, pitch and resinous sapwood prior to application of first paint or stain coat.
 - 2. For surfaces to be painted, fill nail holes, cracks, joints and defects with spackling compound. Apply after first coat of paint.
 - 3. For surfaces to receive transparent finish, fill nail holes, cracks and defects with wood filler matching finish color.
 - 4. Sand surfaces smooth. Dust to remove debris.
- C. Concrete Masonry Units
- 1. Rub CMU to remove loose mortar and debris. Fill irregularities with cement grout.
 - 2. Ensure that paint on existing walls is compatible with new paint type specified. Contractor shall be responsible for priming, sanding, stripping, filing existing cracks and holes, and otherwise preparing existing walls for new paint per manufacturer's recommendations.

- D. Wash galvanized metals with xylol to remove grease, oil and contaminants. Wipe dry with clean cloth.
- E. Ferrous Metals
 - 1. Wire brush or sandpaper surfaces to remove rust and mill scale.
 - 2. Clean with xylol to remove grease, oil and contaminants. Wipe dry with a clean cloth.
 - 3. Sand exposed steel columns smooth.
- F. Hollow Metal Frames and Doors
 - 1. Marred prime coat finish shall be thoroughly cleaned and sanded smooth removing all mortar and caulking before paint is applied. Touch up prime coat.
 - 2. Finish paint products shall be brush applied to frames and roller-applied to doors.
 - 3. Sand existing frames down to bare metal or smooth paint. Reprime.
- G. All surfaces to be painted shall be maintained between 60 degrees and 90 degrees F for 48 hours prior to, during, and 48 hours after application depending on relative humidity based on manufacturer's directions.
- H. Concrete
 - 1. Patch large openings and holes with Portland Cement Mortar and finish flush with adjacent surface. After priming, fill any remaining small holes with Swedish putty made by mixing dry whiting with prime coat of paint.
 - 2. Remove form oil from poured-in-place concrete by washing concrete with Xylol.

3.2 APPLICATION

- A. Apply paint only when moisture content of finish surface is within manufacturer's recommended limits.
- B. Apply paint materials using clean brushes and rollers. Apply paint to recommended dry film thickness as specified by manufacturer, unless noted otherwise in the specification.
- C. No spray applications are allowed except block filler, which must be backrolled into CMU and concrete pores per manufacturer's recommendations and except the following structural elements which may be sprayed: exposed structure, conduit, piping in mechanical, electrical custodial rooms. **FINISH COATS OF PAINT MAY NOT BE SPRAY APPLIED IN ANY MANNER.**

- D. Fill open grained wood with filler and wipe before first varnish coat. Lightly sand between each sealer/varnish coat.
- E. Apply materials at a rate not to exceed that recommended by paint manufacturer for surface being painted, less ten percent for losses. Primers may be tinted if required by application or material color conditions.
- F. Comply with manufacturer's recommendations for drying time between coats.
- G. Sand and dust surface between coats to remove visible defects.
- H. Finish coats shall be smooth, free of brush marks, streaks, laps, pile-up of paint, skipped and missed areas. Final coat shall be specified color. BLOCK FILL AND INTERMEDIATE COATS SHALL EACH BE ONE-HALF TINT LIGHTER THAN SUBSEQUENT COATS.
- I. DO NOT APPLY ADDITIONAL COATS UNTIL COMPLETED COAT HAS BEEN REVIEWED BY ARCHITECT. ONLY REVIEWED COATS OF PAINT SHALL BE CONSIDERED IN DETERMINING NUMBER OF COATS APPLIED.
- J. Make edges of paint adjoining other materials or colors clean and sharp without overlapping.
- K. Primer coats may be omitted for surfaces specified to receive factory applied primer.
- L. Apply CMU block filler at a rate to ensure complete coverage with all CMU pores filled. Semi-Gloss latex enamel shall be applied over CMU with a minimum dry film thickness of 4.0 mils.
- M. Total dry film thickness of coatings, excluding block filler, over high abuse CMU walls shall be a minimum of 8.0 mils.
- N. Total dry film thickness of paint over ferrous metals, excluding primer first coat, shall be a minimum of 2.5 mils.
- O. Paint inside of ductwork flat black for entire area visible through ceiling/wall openings. Paint underside of ductwork and other visible items above ceiling flat black for entire area visible through openings.
- P. Prime and finish tops, bottoms and side edges of interior and exterior doors.
- Q. Paint exposed pipes and ductwork in all areas same color as adjacent wall surfaces, including all overhead pipes and ductwork and exposed structure.

- R. Apply primers to any bare metal within the same working day as the metal is made bare to prevent immediate rusting.
- S. General Contractor shall schedule blockfill and each subsequent coat of paint.

END OF SECTION

SECTION 10 001

MISCELLANEOUS SPECIALTIES

I. PART 1 - GENERAL

1.1 SUBMITTALS

- A. Submit shop drawings in accordance with Section 01 100 - Special Project Procedures. Indicate construction, materials, finishes, dimensions resulting from job measurements, and fabrication and installation instructions. Full size physical samples are acceptable if shop drawings are not available.
- B. Submit manufacturer's literature in accordance with Section 01 100 - Special Project Procedures. Include manufacturer's product description for each component.
- C. Submit color samples of each color or finish available for Owner's selection.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver material to project site in manufacturer's original packaging after building is enclosed.
- B. Store and handle materials to prevent damage to prefinished surfaces and operating components.

1.3 QUALITY CRITERIA

- A. All products must meet requirements of Americans With Disabilities Act (ADAG).
- B. All materials shall be in compliance with flame spread and smoke contribution requirements of ASTM E-84.

II. PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHER CABINETS

- A. Acceptable manufacturers include the following companies:
 - 1. J. L. Industries, Inc., Model # 1017F-17
 - 2. Larsen Manufacturing Company, Model # 2409-GR
 - 3. Approved equal by Seco Manufacturing Co.
 - 4. Approved equal by Potter-Roemer, Inc.

- B. All fire extinguishers and brackets for wall-mounted fire extinguishers shall be provided and installed by the Owner.
- C. All fire extinguisher cabinets shall be U.L. listed and F.M. accepted.
- D. Provide and install steel semi-recessed cabinet with 2 ½" rolled edge trim. Door style shall be full tempered glass with pull, without lock, prefinished white.

2.2 TOILET ACCESSORIES

- A. Specified products are listed as a minimum standard of quality and basis of design, equal products by Bradley and Franklin Brass. Refer to Drawings for quantities and locations. See drawings for mounting height.

CODE	PRODUCT	MFGR	PRODUCT #
A	36" HORIZONTAL GRAB BAR	BOBRICK	B6806 X 36"
B	42" HORIZONTAL GRAB BAR	BOBRICK	B6806 X 42"
C	MIRROR	BOBRICK	B-165 2448
D	HAND DRYER (WHITE CAST IRON HOUSING WITH FIXED NOZZLE)	WORLD DRYER	A-54-974
E	12" HORIZONTAL GRAB BAR	BOBRICK	6806 x 12"
F	24" HORIZONTAL GRAB BAR	BOBRICK	6806 x 24"

- B. Equal products may be submitted during bidding.

2.3 FRAMED MIRRORS

- A. Framed mirrors shall be 24" x 48", ¼" thick plate glass which conforms to CS-27-36, electrolytically copper plated, guaranteed for five years against silver spoilage. Frames shall be ½" x ½" x ½" SS gauge polished stainless steel with square mitered corners. Install mirror plumb, level, and square with theft proof fasteners thru 22 ga. galvanized steel backs slotted for fasteners. A Styrofoam protective pad shall be installed between the mirror and steel back.

- B. Caulk joints between bottoms of mirrors and tops of backsplashes and sidesplashes at vanities with clear mildew-resistant silicone sealant. See Section 07 900.

III. PART 3 - EXECUTION

3.1 FIRE EXTINGUISHER CABINETS

- A. Anchor fire extinguisher cabinets to CMU walls with lead shield expansion bolts and oval head screws.
- B. Anchor fire extinguisher cabinets to metal stud/gypsum board walls with screws into fire retardant treated wood blocking.

3.2 TOILET ACCESSORIES

- A. Rigidly secure toilet accessories plumb, level and true to line in accordance with manufacturer's directions. Accessory mounting heights shall comply with specified requirements.
- B. In areas where accessories are recessed into 8" fire rated CMU wall a $\frac{5}{8}$ " fire rated GpDw fire box recess shall be provided around the recessed portion of the unit.
- C. Grab bars shall be installed using theft proof through bolts. The backs of escutcheons and the face of the wall to receive the bars shall be parged with "Sika Colma Sol" prior to tightening the bolts.
- D. See working drawings for toilet accessory items, locations and mounting heights.
- E. Contractor shall provide a certificate indicating that the grab bars and anchorage shall withstand a safe loading pressure of 800 pounds.
- F. Where accessories and cabinets are mounted into or on metal stud and gypsum drywall walls, anchor to fire retardant treated wood blocking.

END OF SECTION

SECTION 10 100

VISUAL DISPLAY BOARDS

I. PART 1 - GENERAL

1.1 SCOPE

- A. This section includes provision and installation of factory-framed tack boards and markerboards.

1.2 SUBMITTALS

- A. Submit shop drawings showing materials, dimensions, finishes, sizes, hardware, fittings, anchorage and manufacturer's installation recommendations. Submit list of room numbers showing which boards each room receives and plan showing proposed location of corridor tackstrips.
- B. Submit samples of material as requested by Architect.
- C. Submit samples of manufacturer's available colors and finishes for Architect's selection.
- D. Submit manufacturer's maintenance recommendations and available project data.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original, unopened package.
- B. Store unopened products as recommended by manufacturer in an enclosed, dry location off the ground.
- C. Prevent all forms of damage to boards and replace damaged materials promptly.

1.4 GUARANTEE

- A. Board manufacturer shall provide a guarantee that the installed product will retain its original writing and erasing qualities for 50 years from date of substantial completion.

II. PART 2 - PRODUCTS

2.1 PRODUCT CHARACTERISTICS

- A. All ready-framed boards shall be manufactured, fabricated and assembled by the same company.

- B. All boards shall be one piece construction with no splices in surface material or frames.
- C. Acceptable manufacturers:
 - 1. Claridge Products and Equipment Co.
 - 2. PolyVision Corporation
 - 3. Platinum Visual Systems
 - 4. Newline Products
 - 5. American Visual Display Products (Series 2000)
- D. All boards shall be 4'-0" in height by length shown on drawings.

2.2 PRODUCTS

A. MARKERBOARDS

- 1. Markerboards shall be used in all classrooms and other locations as shown on drawings.
- 2. Core material shall be 1/2" MDF. Backing shall be .015" aluminum sheet. Texture on the reverse face that will allow the use of a standard chalkboard adhesive for attachment to a wall.
- 3. The writing surface of markerboards shall be seamless 28 gauge (minimum) porcelain enameled steel with minimum .0025" ground primer coat on both sides.
- 4. All markerboards shall be furnished with the following accessories:
 - a. One flag holder
 - b. Two map winders
 - c. Four 1" hook clips
 - d. Continuous 1" map rail with cork insert and end stops. Cork insert shall match tackboard.
 - e. One marker tray
- 5. Markerboards shall be white, high gloss.

B. TACKBOARDS

- 1. Tack boards shall consist of a self-healing, vinyl impregnated, seamless 1/4" thick colored cork with burlap backing positively adhered and banded to 1/4" tempered hardboard.
- 2. Backing shall be of such texture that will allow for use of standard board adhesive for attachment to a wall. The cork material shall be fine grained and the color shall be throughout the cork material.
- 3. The tack board surface must be such that it may be washable with household detergents.
- 4. Provide and install sizes as indicated on the drawings. Color shall be selected by Owner.
- 5. All tack boards shall be furnished with 1" map rails with continuous cork insert and end stops. Cork insert shall match tackboard.

C. TRIM

1. Trim for markerboards and tack boards shall be 6063T-5 aluminum, etched and satin anodized. Frame shall have a face width of 3/4" and corners shall be notched and broken for a true miter. Markerboards shall have a map rail at the top of the unit with accessories listed in 2.2.A.4. Markerboards shall also be equipped with end stops and marker troughs at bottom of unit with end closures.

III. PART 3 - EXECUTION

3.1 PREPARATION

- A. Surfaces to which materials are to be installed shall be clean and dry. Installer shall inspect substrate for suitability and compliance with manufacturer's recommendations prior to installation.

3.2 INSTALLATION

- A. Install tackboards and tackstrips minimum 5'-0" from exit doors from rooms or corridors.
- B. Anchor boards to masonry walls in accordance with manufacturer's printed recommendations using adhesive and clips at maximum 2'-0" o.c. beginning at ends of boards.
- C. Furnish all required materials for installation, including screws, posts, angles, and adhesives, as required.
- D. Install ready-framed boards with adhesive applied to back of board by staggered egg size portions of adhesive at 12" on center. Adhesive shall not be closer than 6" to edge of board. Use one gallon of adhesive for each 70 square feet board area. Install in accordance with manufacturer's printed recommendations.
- E. All boards shall be installed as follows:
 1. 33" to bottom of board.

3.3 CLEANING

- A. After erection, clean boards and metal trim in accordance with manufacturer's printed recommendations.

END OF SECTION

SECTION 10 155

SOLID POLYMER TOILET COMPARTMENTS

I. PART 1 - GENERAL

1.1 SCOPE

- A. Work included in this section shall include toilet compartments.

1.2 SUBMITTALS

- A. Submit shop drawings which indicate plans, elevations, construction details, sizes of openings, anchoring and leveling details, partition thickness, protective coatings, finishes, colors, hardware and accessories, fittings and fastenings, field work required for installation and coordination with other trades.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver components in manufacturer's unopened packaging bearing manufacturer's name, contents, stock number and order number.
- B. Store components in original packaging under protective cover and protect from damage. Stack containers in accordance with manufacturer's recommendations.
- C. Handle materials to prevent damage to finished surfaces.

1.4 PROJECT CONDITIONS

- A. Install toilet compartments after plumbing fixtures and all floor, wall and ceiling finishes have been installed.

II. PART 2 - PRODUCTS

2.1 COMPARTMENTS

- A. Products of the following manufacturers shall be acceptable. Similar products of other manufacturers shall be subject to Architect's review.
 1. Scranton Products (Santana/Comtec/Capitol)
 2. Rockville Partitions
 3. Global
 4. Metpar

5. AMPCO
6. Accurate Partitions Corp.
7. PSISC (Columbia Partitions)

B. Compartments shall be overhead braced with a headrail.

2.2 MATERIALS

A. Doors and pilasters shall be solid polymer core, single component construction. Color shall be uniform through to core. Match color of existing partitions on upper level.

2.3 FABRICATION

A. Provide 1" thick doors and 1-1/4" thick pilasters constructed of solid polymer core with uniformly machined radius edges.

B. Pre-notch and pre-drill panels for hardware at factory. Conceal reinforcement for hardware installation.

C. Provide inswing and outswing doors, as indicated on working drawings. Inswing doors shall provide a clear opening of at least 2'-0" and barrier-free outswing doors shall provide a clear opening of at least 2'-8".

D. Where portions of core are exposed to receive hardware, seal against moisture with manufacturer's recommended products.

E. All doors and pilasters shall have all edges machined to a radius of .250" and all sharp edges to be removed and buffed. All doors and pilasters shall be cleaned before shipping.

F. All doors and pilasters shall be 55" high, installed with bottom edge 12" clear above finish floor.

2.4 HARDWARE AND FITTINGS

A. Provide stainless steel, continuous contact piano type hinges weighting not less than 1.5 pounds per foot, with nylon or stainless steel pivot points and either nylon, self-oiling graphite-bronze or thrust-frictionless bearings for moving parts. Pivot pin shall be 1/4" type 304 stainless steel. All fasteners shall be 5/8" stainless steel "Prostar" tamper-proof screws, located 8" o.c. on door and pilaster. Fasteners shall be concealed under a snap on cover. Cover shall be fastened top and bottom with theft-proof "Prostar" fasteners.

B. Panels shall be anchored to front pilasters with a continuous stainless steel "U" channel with theft-proof screws. Panels and pilasters shall be anchored to wall with three 1" x 6" high stainless steel stirrup

- brackets with theft-proof thru bolts. Brackets shall return minimum 3" onto panel.
- C. Pilaster shall be anchored to steel channels per detail on drawings.
 - D. Latch, bumper and keeper shall be stainless steel.
 - E. Combination bumper/coat hooks shall be stainless steel with a rubber bumper.
 - F. Door pull shall be stainless steel for outswinging doors indicated on working drawings.
 - G. Fasteners - Exposed and concealed fasteners shall be stainless steel sex bolts with theft-resistant, one-way heads.
 - H. Headrail shall be heat treated, extruded aluminum with integral anti-grip loafer rail and anodized fittings.
 - I. All exposed hardware shall be constructed of stainless steel.

III. PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. Erect compartments plumb and level, attached to supporting structure as indicated on reviewed shop drawings.
- B. Clearance between door edge and pilaster shall be ¼".
- C. Material shall comply with ASTM D635-77 and supply acceptable test results for non-absorbency in compliance with FDA-G-96003.

3.2 ERECTION

- A. Attach pilasters to walls with minimum of three stirrup brackets located near top and bottom of panel. Secure using fasteners as indicated on reviewed shop drawings.
- B. Level and plumb compartments. Tighten pilaster fasteners.
- C. Set tops of doors level with tops of pilasters when doors are in closed position.
- D. Attach aluminum headrail to top of pilasters and adjacent wall structure.

3.3 ADJUSTMENT AND CLEANING

- A. Level, plumb and tighten pilaster fasteners.

- B. Lubricate and adjust hardware for proper operation.
- C. Set hinges on all doors to return to closed position.
- D. Remove protective coverings from compartments and hardware.
- E. Clean exposed surfaces of compartments and hardware using materials and methods recommended by manufacturer.

END OF SECTION

SECTION 10 440

SIGNS AND NUMBERS

I. PART 1 - GENERAL

1.1 SCOPE

- A. This section includes provision and installation of room signs and numbers in all numbered spaces shown in Phase 3D.

1.2 SUBMITTALS

- A. Submit shop drawings in accordance with Contract Conditions. Indicate construction, materials and finishes, dimensions resulting from job measurements, and fabrication and installation instructions.
- B. Submit manufacturer's literature in accordance with Contract Conditions. Include manufacturer's product description for each component. Furnish manufacturer's installation instructions.
- C. Submit samples of each type signage indicated with countersunk screw holes drilled.
- D. Space numbers shown on floor plans shall be verified by Owner and are subject to change. Submit list of numbers and signs by room number for approval by Owner.

1.3 REFERENCE STANDARDS

- A. All signs provided for spaces to be used by the public shall be manufactured and installed per ANSI latest edition and ADA (Americans with Disabilities Act) requirements.

1.4 ACCEPTABLE MANUFACTURERS

- A. APCO, ASI, American Graphics, Multi-Graphics Inc., Atlanta ADA Sign Systems, Graphic and Engraving Solutions, Sign International, Mohawk Sign Systems and Bayuk Graphic Systems, Inc.

II. PART 2 - PRODUCTS

2.1 BUILDING SIGNAGE

- A. All rooms and spaces shown on floor plan with a space number shall have an identifying sign.
 - 1. Type #1 Signs:
 - a. Provide engraved plastic sign with non-glare surface, minimum 1/8" thick x 1-1/2" high x length to allow for

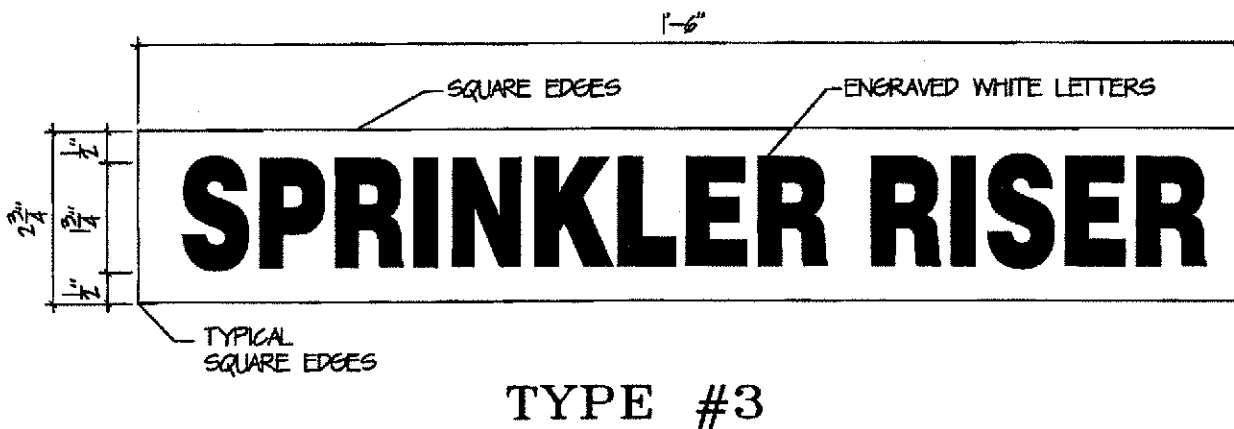
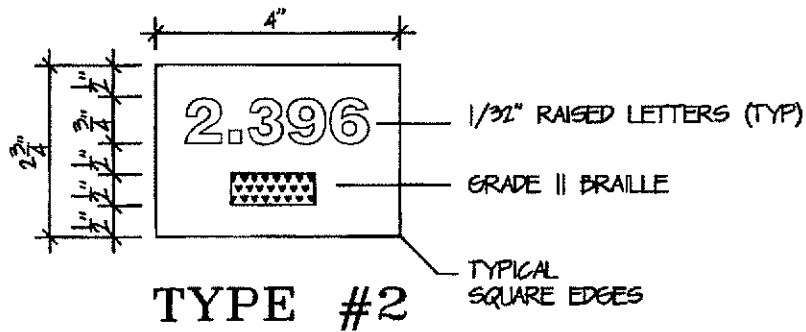
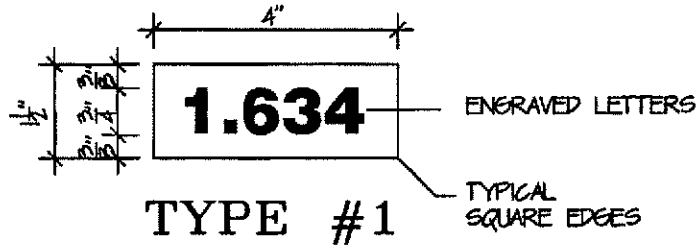
maximum of four 3/4" digits, one letter and one decimal point at non-public spaces such as Mechanical Rooms, Electrical Rooms and custodial rooms, mounted on door frame head. Braille is not required for these signs.

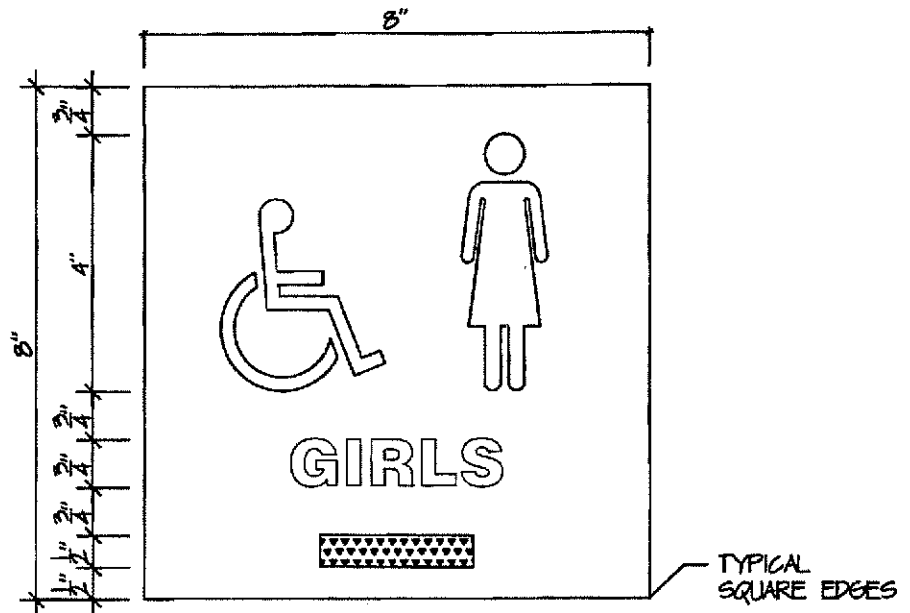
2. Type #2 Signs:
 - a. At all other spaces, room number signs shall be approximately 2-3/4" high x 4" long with room number at the top and braille letters underneath on the same sign. Letters shall be raised and brailled per ANSI and ADA, except for non-public areas designates as mechanical, electrical or custodial.
 - b. Number signs shall be provided at each end of each corridor, at each side of communicating doors, and at entry into all rooms or spaces. If space has no door, then install sign at entry into space.
 3. Type #3 Signs:
 - a. Provide engraved plastic name signs with non-glare surface, minimum 1/8" thick, with no Braille, at each Electrical Room that reads "ELECTRICAL" and Sprinkler Riser Room that reads "SPRINKLER RISER". Signs shall be red with 1/4" white Helvetica condensed letters.
 4. Type #4 Pictograph Signs:
 - a. Provide 8" wide x 8" high x 1/8" international picture symbol signs with non-glare surface with square edges for all toilet rooms, with the word "Girls" or "Boys" inscribed below the picture symbol as appropriate. Handicap facilities signs shall include the international symbol of accessibility in accordance with Section 4.28.5 in ANSI, A117.1 - 1986.
 - b. Mount at 58" A.F.F. to top of sign, directly under room number sign finished to match sign.
 - c. Install blue 6" x 6" x 1/8" international symbol of accessibility at all individual toilet rooms indicated on drawings as "barrier free", as well as barrier-free stalls within gang toilets.
 5. Type #5 Signs:
 - a. Provide name signs for all entrances to the following spaces, providing 3/4" high raised digits across the top of the sign and brailled letters across the bottom of sign:
 - 1). All offices and reception areas - use actual title or "Office" only as required by Owner.
 - 2). "Restroom" at all faculty and individual student toilets.
 - 3). "Conference" (in Admin. at all doors).
- B. All signs shall be white helvetica medium letters/number on matte color background U.N.O. Color shall match signs from Phase 3B and 3C completed in August 2010.

III. PART 3 - EXECUTION

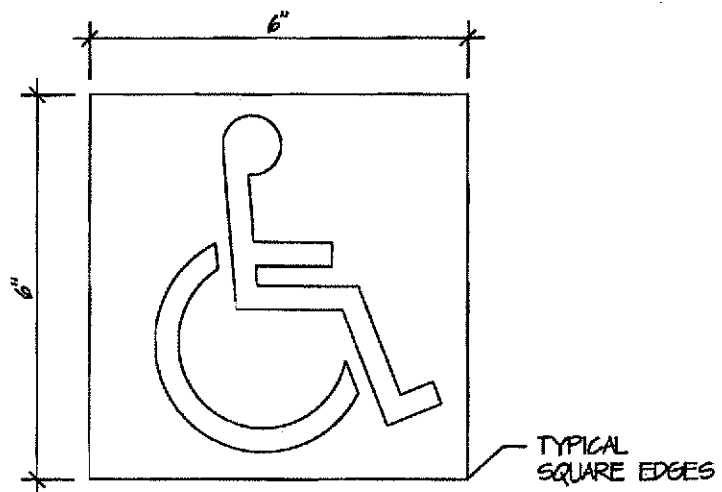
3.1 Installation

- A. Install all signs except mechanical, electrical or custodial at 60" A.F.F. to centerline, 2" from latch edge or door frame or opening where allowed by code or ADA, with silastic adhesive or double-sided vinyl tape and two vandal-proof, stainless steel counter sunk screws with finish to match sign. Install with drilled inserts at CMU walls and toggle bolts at GpDw walls.
- B. Do not secure signs to wood doors.
- C. Submit list of sign numbers and space names for approval by Owner.

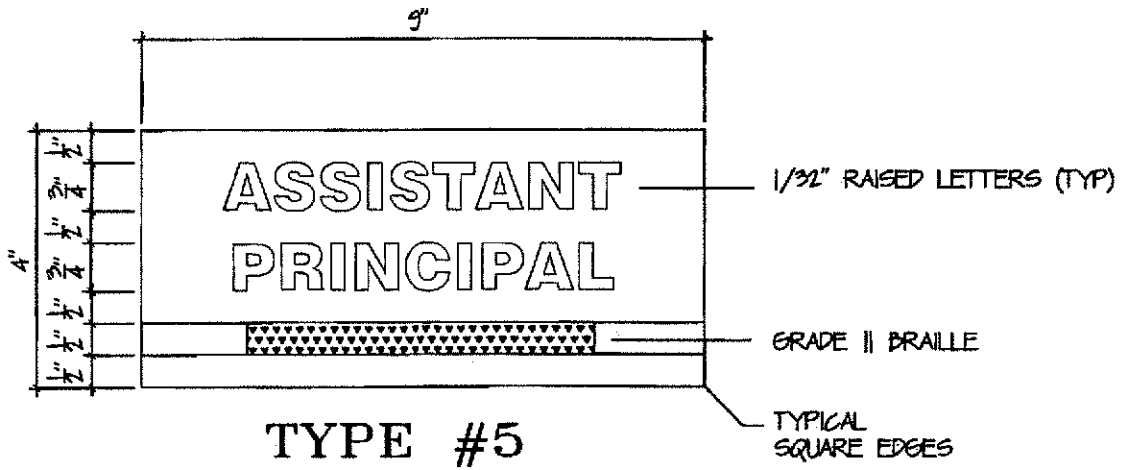
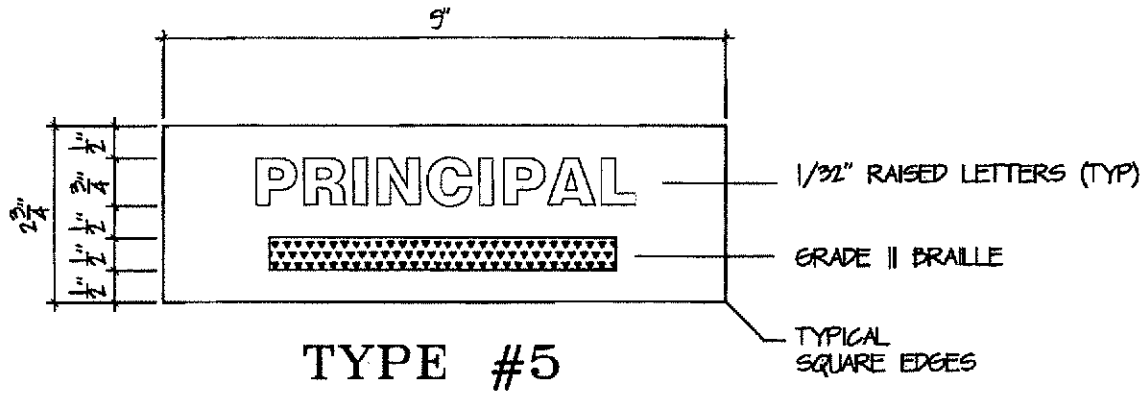




TYPE #4
OUTSIDE GANG TOILETS



TYPE #4
INSIDE GANG TOILETS OR
ON INDIVIDUAL TOILETS



SECTION 10 710

ALUMINUM CANOPIES

I. PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes provision and installation of pre-engineered aluminum walkway cover, columns and related items for a complete installation.

1.2 QUALITY ASSURANCE

- A. Canopy system shall be designed to meet a minimum live load requirement of 25 lbs. per square foot, wind load (uplift) of 25 lbs. per square foot, unless more stringent requirements are called for in Building Codes, in which case the most stringent shall apply.
- B. Extruded aluminum roof deck and structure shall be able to withstand the concentrated loads of adult foot traffic without damage.
- C. Design shall meet the wind requirements in ASCE7-95. Protective cover shall be wholly produced by a recognized manufacturer with at least five years experience in the design and fabrication of extruded aluminum walkway cover systems. Components shall be assembled in shop to greatest extent possible to minimize field assembly. Protective cover shall be installed by manufacturer. Third party installation is not acceptable.
- D. All material shall be wholly produced by a recognized manufacturer with at least five (5) years experience in the design and fabrication of extruders. Protective cover system, including material and workmanship, shall be warranted from defects for a period of one year from substantial completion of installation.

1.3 SUBMITTALS

- A. Prepare and submit complete shop drawings including all necessary plan dimensions, elevations and details.
- B. Submit manufacturer's literature which indicates product description, including finish and installation instructions applicable to this project.
- C. Submit 6" x 6" samples of specified anodized finish.

- D. General Contractor shall verify all dimensions and elevations at each column, finish floor and related soffits before releasing to manufacturer for fabrication.
- E. Certification: Submit design calculations signed by a registered Professional Engineer, licensed in the project State of Georgia. Design calculations shall state that the protective cover system design complies with the wind requirements of ASCE 7-95, the stability criteria of applicable Building Code and all other governing criteria.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Handle canopies to prevent damage to finished surfaces. Protect from damage or staining adjacent work.

II. PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. The following acceptable manufacturers are specified by trade name and product identification of a specific manufacturer for the purpose of establishing a standard of quality:
 - 1. Mitchell Metals, LLC; Smyrna, GA
 - 2. American Walkway Covers, LLC; Wetumpka, AL
 - 3. E. L. Burns Company; Shreveport, LA
 - 4. Dittmer Architectural Aluminum; Winter Springs, FL
 - 5. Peachtree Protective Covers, Hiram, GA
 - 6. Perfection Architectural Systems, Inc.; Orlando, FL
 - 7. Mapes Industries, Inc.; Lincoln, NE
 - 8. Superior Metal Products Company, Inc.; Birmingham, AL
 - 9. Mason-Florida, Leesburg, FL

2.2 MATERIALS

- A. Aluminum canopy shall be D-36, all welded extruded aluminum system complete with internal drainage with an extruded aluminum roof deck and structure. Roll formed aluminum will not be acceptable.
- B. Expansion joints shall be included to accommodate temperature changes of 120° F. Expansion joints shall have no metal to metal contact.
- C. Aluminum Members: All sections shall be extruded aluminum 6063 alloy, heat treated to T-6 temper.
- D. All extrusions shall be satin etched and clear anodized, Class 1 AA-M-10 C-22 A-41 (AAMA 611).

- E. Columns shall be minimum 4" x 4" x .125" thick x 8'-0" high or as shown on drawings. Columns shall have factory welded internal plates which provide for drainage into the columns with no exposed fasteners. Columns shall be radius-cornered tubular extrusions.
- F. Fascia/beam shall be minimum 4" x 6". Beams shall be welded into one piece rigid bents in the manufacturer's shop. Fascia beam shall have a continuous interlocking extruded tie down member. Fascia/Beam shall have internal splices at approximately 20'-0" on center with factory mitered and welded corners. Extruded structural ties shall be rigidly installed in top of all beams, also serving as closures between draining deck sections.
- G. Deck: Roof deck shall be a minimum of 3" deep. Deck shall be extruded self-flashing sections interlocking into a composite unit. Closures at deck ends shall be welded plates.
- H. Water shall drain internally from roof to beams to columns, spouting out at ground level through designated columns at the street side of the system.
- I. Fascia: Fascia shall be manufacturer's standard shape. Size as indicated on drawings.
- J. Flashing: Flashing shall be .040 aluminum (min.). All flashing to other adjacent construction shall be furnished and installed by the canopy installer.
- K. All fasteners which penetrate the roof deck shall have neoprene gaskets.
- L. All fasteners shall be stainless steel.

2.3 FABRICATION

- A. Bent Construction: Beams and columns shall be factory welded with neatly mitered corners into one-piece rigid bents. All welds shall be smooth and uniform using an inert gas shielded arc. Suitable edge preparation shall be performed to assure 100% penetration. Grind welds only where interfering with adjoining structure to allow for flush connection. Field welding is not permitted. Rigid mechanical joints shall be used when shipping limitations prohibit the shipment of fully welded bents.
- B. Deck Construction: Deck shall be manufactured of extruded modules that interlock in a self-flashing manner. Interlocking joints shall be positively fastened at 8" O.C. creating a monolithic structural unit capable of developing the full strength of the

sections. The fastenings must have minimum shear strength of 350 pounds each. Deck shall be assembled with sufficient camber to offset dead load deflection.

III. PART 3 - EXECUTION

3.1 Examine surfaces designated to receive work described in this section for conditions adversely affecting the finished work. Repair or replace surfaces not meeting tolerances or quality requirements imposed within specifications governing substrate construction prior to initiating this work.

3.2 EXPANSION JOINTS

A. Provide expansion joints in walkway lengths as indicated on reviewed shop drawings in accordance with manufacturer's recommended practice.

3.3 ERECTION

A. Erection shall be performed by the manufacturer or an erector approved by the manufacturer in accordance with reviewed shop drawings. Installation shall be scheduled after all concrete, masonry and roofing work in the area are complete. Column sleeves and/or anchor bolts shall be provided by the manufacturer and installed by the erector. Canopy shall be installed plumb and level. All wall anchors shall be water-tight.

B. A ¼" diameter weep hole shall be drilled at the base of all non-draining columns.

C. Columns/Footings: Columns shall be attached by boring a hole through the existing concrete sidewalk at appropriate column locations and excavated to a specified depth below sidewalk finish grade. If the column is to be located outside the existing sidewalk, it shall be in a separate footing. 3000 PSI concrete shall be placed into the excavated hole to serve as the column footing. (Provide reinforcing steel as required to meet structural requirements.) The top of the footing shall be finished level with the top of the existing sidewalk to insure proper drainage. Columns located on top of concrete check walls of steps or retaining walls shall be coordinated with concrete pour to block out and provide attachments of columns to concrete.

D. Columns and beams shall be aligned before columns are grouted.

E. Downspout columns shall be filled with grout to the drainage hole to prevent standing water.

- F. Downspout deflectors shall be installed after grouting.
- G. Deck butt joints shall have extruded fitted rain caps at least 6" long and full depth of deck at sides. Care shall be taken to prevent scratching.

END OF SECTION

SECTION 11 402

FOOD SERVICE EQUIPMENT
(NOT IN CONTRACT)I. PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

- A. Extent of food service equipment work indicated on drawings and by provisions of this Section, including schedules and equipment lists associated with either drawings or this Section.
1. Refer to 'Kitchen Equipment Schedule' on drawings for a description of equipment furnished and installed by Contractor.
 2. Items listed as OF/CI are Owner Furnished/Contractor Installed.
 3. Items listed as OF/OI are Owner Furnished/Owner Installed.
- B. Refer to Division-15 sections for required drain traps, steam traps, atmospheric vents, valves, pipes and pipe fittings, ductwork, and other materials necessary to complete mechanical hookup of food service equipment.
- C. Refer to Division-16 sections for wiring, disconnects, and other materials necessary to complete electrical hookup of food service equipment.
1. Electrical work shall comply with requirements of Division-16.
 2. The contractor is advised that the electrical characteristics of each item of equipment have been intentionally omitted from this section. For the electrical characteristics of each item of equipment the contractor shall refer to the electrical drawings.
 3. Kitchen equipment supplier shall be responsible for providing equipment compatible with the electrical service provided.

1.3 WORK INCLUDED

- A. Installation and connection:
1. Where kitchen equipment is shown to be furnished by contractor, the complete installation of equipment, as defined

- in this section, is part of the contractor's contract.
2. Where kitchen equipment is shown to be furnished by the Owner and schedule indicates "Contractor Installed", the complete installation of equipment, as defined in this section, is part of this contract.
 3. Where kitchen equipment furnished by the Owner and schedule indicates "Owner Installed", the complete installation of equipment, as defined in this section, part of the separate contract.
 4. Contractor shall furnish, complete all food service equipment, labor, materials, tools and equipment necessary for the complete installation of kitchen equipment and refrigeration in a first-class manner, including all work incidental thereto in accordance with the drawings and these specifications.
 5. The term "Complete Installation" shall mean the delivery of the kitchen equipment and refrigeration, with transportation and trucking charges prepaid to the building site, uncrated, assembled, set in place, leveled, calibrated, and connected to utilities, operational, checked out, clean and permitted.

1.4 QUALITY ASSURANCE

- A. Food Service Equipment Supplier/Vendor shall have a permanent, fully staffed and equipped office within 100 miles of the project site. Such office shall have been in existence for a minimum of 5 years prior to bid.
- B. Installer's Qualifications: Firm with min. 3 years of successful installation experience on projects with food service equipment similar to that required for Project.
- C. Fabricator's Qualifications:
 1. Where indicated units require custom fabrication, provide units fabricated by shop skilled and with min. 5 years of experience in similar work.
 2. Fabricate all custom equipment items at same shop.
 3. Where units cannot be fully shop-fabricated, complete fabrication work at Project site.
- D. Manufacturer's Qualifications: Firms regularly engaged in manufacture of food service equipment of types, capacities, and sizes required, whose products in satisfactory use in similar service for min. 5 years.
- E. Codes and Standards:
 1. NSF Standards:
 - a. Comply with applicable National Sanitation Foundation standards and recommended criteria.
 - b. Provide each principal manufactured or fabricated item of food service equipment with NSF "Seal of Approval".

2. UL Labels:
 - a. Where available, provide UL labels on prime electrical components of food service equipment.
 - b. Provide UL "recognized marking" on other items with electrical components, signifying listing by UL, where available.
3. ANSI Standards: Comply with applicable ANSI standards for electric powered and gas-burning appliances, for piping to compressed gas cylinders, and for plumbing fittings including vacuum breakers and air gaps to prevent siphonage in water piping.
4. NFPA Codes: Install food service equipment in accordance with following National Fire Protection Codes (NFPA) Codes:
 - a. NFPA 54 - National Fuel Gas Code.
 - b. NFPA 70 - National Electrical Code.
 - c. NFPA No. 96 - "Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment".
5. ASME Boiler Code: Construct steam generating and closed steam heated equipment to comply with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; Section IV for units not exceeding 15 psig or 250°F (121°C), or Section I for higher pressure/temperature units.
6. Health Code: Install food service equipment in accordance with local health department applicable requirements.

F. Permits:

1. Contractor to provide, and pay costs for all required permits for installation and operation of pressure vessels and boilers.

1.5 CERTIFICATIONS

- A. Certificate of Compliance: Submit, as part of Shop Drawings, certification from manufacturer of product or materials furnished herein, stating that product(s) and / or material (s) being furnished comply with technical provisions contained herein.
 1. Any and all deviations from technical provisions of specifications shall be specifically noted.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for each item; include roughing-in dimensions, service connection requirements, performances, power and fuel requirements, water and drainage requirements and other similar information.

B. Shop Drawings:

1. Submit dimensioned roughing-in drawings, at min. scale 1/4" = 1'-0", showing mechanical and electrical requirements.
2. Submit dimensioned fabrication drawings for custom fabricated equipment including plans, elevations, and sections, at min. scale 3/4" = 1'-0", showing materials and gages used.

C. Maintenance Manuals:

1. Submit maintenance data and parts list for each item of food service equipment.
2. Include this data, product data, shop drawings, and wiring diagrams in maintenance manual; in accordance with requirements of Division 1.
3. Provide instructional video tapes for Owner's permanent library describing operation and maintenance procedures suggested for equipment where tapes are specified.

D. Equipment and Cost List:

1. Within thirty (30) days of the award of contract the contractor shall submit to the architect a complete list of equipment containing make and model numbers of each items of equipment to be furnished. List to include cost for each individual item of equipment.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver food service equipment in factory-fabricated containers designed to protect equipment and finish until final installation.

1. Make arrangements to receive equipment at project site, or to hold in warehouse until delivery made to job site.

B. Store food service equipment in original containers, and in location to provide adequate protection to equipment while not interfering with other construction operations.

C. Handle food service equipment carefully to avoid damage to components, enclosures, and finish.

1. Do not install damaged food service equipment; replace and return damaged components to equipment manufacturer.

1.8 PROJECT CONDITIONS

A. Take field measurements to assure accurate fit of fabricated equipment.

- B. Check electrical characteristics, and water, steam, and gas pressure.
 - 1. Provide pressure regulating valves where required for proper operation of equipment.
- C. Electrical Requirements: Provide motors and heating elements with electrical characteristics indicated on electrical drawings.

1.9 SPECIAL PROJECT WARRANTY

- A. General Warranty: Provide written warranty signed by Food Service Equipment Supplier/Installer and Contractor, agreeing to replace/repair, if notified within one year after date of Final Acceptance, any equipment found inadequate due to defective materials, workmanship or installation, at no cost to Owner.
 - 1. Provide written warranty, signed by manufacturer, agreeing to replace or repair, within warranty period, compressors with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required; provided manufacturer's instructions for handling, installing, protecting, and maintaining units adhered to during warranty period.
 - 2. Replacement limited to component replacement only, and not labor for removal and reinstallation.
 - 3. Warranty Period: 5 years from date of Final Acceptance.
- B. Single Point Warranty Servicing: As part of warranty, food service equipment supplier shall provide a 'single point' contact for warranty claims.

1.10 INSTRUCTION AND TRAINING

- A. As part of project closeout, and prior to requesting final inspection, food service contractor, in the presence of the owners personnel, conduct an 8 hour training session covering the proper start-up, operation, cleaning and maintenance of equipment furnished under this section. Upon the conclusion of the training the contractor shall submit, to the Architect, a written statement indicating the following:
 - 1. List of individuals participating in training.
 - 2. Nature and content of training.
 - 3. Signed statement, by participants, that participants fully understand the operation of the equipment.
- B. Training session shall be video taped for use by owner for additional employee training.

II. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: AISI Type 304.
1. Provide non-magnetic sheets, free of buckles, waves, and surface imperfections.
 2. Provide No. 4 polished finish for any surfaces exposed.
 3. Provide self-adhesive protective paper covering on polished surfaces of stainless steel sheet work, and retain/maintain until time of final testing, cleaning, start-up, and Final Acceptance.
- B. Galvanized Steel Sheet: ASTM A 526, except ASTM A 527 for extensive forming; ASTM A 525, G90 zinc coating, chemical treatment.
- C. Steel Sheet: ASTM A 569 hot-rolled carbon steel.
- D. Stainless Steel Tube: ASTM A 554, Type 304 with No. 4 polished finish.
1. Aluminum: ASTM B 209 sheet and plate, ASTM B 221 extrusions, 0.40-mill clear anodized finish where exposed, unless otherwise indicated.
- E. White Metal:
1. Corrosion-resistant metal containing min. 21% nickel.
 2. Make casting free from pit marks, runs, checks, burrs, and other imperfections; rough grind, polish and buff to bright luster.
 3. In lieu of white metal castings, 18-8 stainless steel die-cast or stamped may be used.
- F. Sound Deadening
1. Heavy-bodied resinous coating, filled with granulated cork or other resilient material, compounded for permanent, non-flaking adhesion to metal in 1/8" thick coating.
 2. Apply coating of sound deadening material to underside of tops, drainboards, dishtables, and sinks.
- G. Sealants:
1. ASTM C 920; Type S Grade NS, Class 25, Use NT.
 2. Provide sealant that when fully cured and washed meets requirements of Food and Drug Administration Regulation 21 CFR 177.2600 for use in areas where in contact with food.

- H. Color: Selected by Architect from manufacturer's standard colors.
- I. Backer Rod: Closed-cell polyethylene rod stock, larger than joint width.
- J. Gaskets: Solid or hollow (not cellular) neoprene or PVC; light gray, min. 40 Shore A hardness, self-adhesive or prepared for either adhesive application or mechanical anchorage.

2.2 FABRICATED PRODUCTS

- A. Manufacturers: Subject to compliance with requirements, provide fabrication by one of following:
 - 1. Ace Manufacturing Co.
 - 2. Delfield/Alco, div. of Alco Foodservice Co.
 - 3. Low-Temp Industries, Inc.
 - 4. Southern Equipment Fabricators
 - 5. Atlanta Kitchen Equipment
 - 6. Owens Equipment
 - 7. Commercial Stainless Fabricators (for fabricated work tables, baker's table, receiving tables and sinks)
- B. Refrigeration Hardware: Heavy-duty die-cast zinc, chrome-plated and polished.
 - 1. Hinges: Edge mounted, self-closing type.
 - 2. Latches: Edge mounted, arranged for locking device.
 - 3. Manufacturer: Subject to compliance with requirements, provide refrigerator hardware of one of following:
 - a. Grant Mfg. Co.
 - b. Kason Hardware Co.
 - c. Standard-Keil Co.
- C. Handles and Pulls:
 - 1. Provide stainless steel handles with No. 4 finish, or die-cast zinc with polished chrome-plated finish.
 - 2. Provide die-stamped stainless steel pulls, recessed rectangular type, with beveled edge frame.
 - 3. Manufacturer: Subject to compliance with requirements, provide handles and pulls of one of following:
 - a. Grant Mfg. Co.
 - b. Kason Hardware Co.
 - c. Standard-Keil Co.
- D. Door Slides:
 - 1. Provide stainless steel or galvanized steel door slides with min. load capacity of 100 lbs. per pair, and with positive door stop.

2. Provide ball bearing rollers.
 3. Manufacturer: Subject to compliance with requirements, provide door slides of one of following:
 - a. Grant Mfg. Co.
 - b. Kason Hardware Co.
 - c. Standard-Keil Co.
- E. Hinges:
1. Provide stainless steel hinges, continuous type or butt type as indicated.
 2. Manufacturer: Subject to compliance with requirements, provide hinges of one of following:
 - a. Grant Mfg. Co.
 - b. Kason Hardware Co.
 - c. Standard-Keil Co.
- F. Sliding Door Hardware:
1. Provide extruded aluminum door track.
 2. Provide galvanized steel door sheave with nylon surface and ball bearing inner races.
 3. Provide stainless steel bottom guide pins, spring loaded.
 4. Manufacturer: Subject to compliance with requirements, provide hinges of one of following:
 5. Grant Mfg. Co.
 6. Kason Hardware Co.
 7. Standard-Keil Co.
- G. Adjustable Shelf Supports:
1. Provide stainless steel shelf supports, snap-in type, and stainless steel brackets with countersunk mounting holes.
 2. Manufacturer: Subject to compliance with requirements, provide hinges of one of following:
 - a. Grant Mfg. Co.
 - b. Kason Hardware Co.
 - c. Standard-Keil Co.
- H. Catches: For hinged doors, provide permanent magnetic catch of sufficient strength to hold door shut.
- I. Locks:
1. Manufacturer's standard brass 5-pin cabinet-type lock.
 2. Provide two keys for each lock, keyed separately.

J. Faucets:

1. Cast bronze body with nickel or triple chrome plated.
2. Provide 12" swing spout faucets with 1/2" female flange for mounting on splash of multi-compartment sinks, one for two compartments, two for three and four compartments.
3. Provide deck mounted faucets where indicated.
4. Approved manufacturers subject to conformance with specified model:
 - a. T & S Brass and Bronze Works, Inc.: #B-0409-04.
 - b. Chicago Brass Co.
 - c. Elkay Manufacturing Co.
5. All faucets shall have swing nozzle garden hose connection threads (unless indicated otherwise).
6. All faucets shall have vacuum breakers.

K. Lever Drains:

1. Provide 2", heavy cast-bronze body, removable flat stainless steel strainer, twist handle waste outlet, and one-piece connected chrome-plated brass overflow.
2. Manufacturer: Subject to compliance with requirements, provide hinges of one of following:
 - a. Chicago Brass Co.
 - b. Franklin Machine Products.
 - c. Standard-Keil Co.

L. Casters:

1. Provide min. 6" dia. , unless noted, wheel casters, with 1-1/8" tread width, complying with NSF standards.
2. Provide sealed, self-lubricating bearings, cadmium-plated or bright zinc-plated steel disc wheels, and solid synthetic rubber tires.
3. Provide foot brakes on **ALL** casters per unit.

2.3 FABRICATION OF EQUIPMENT

A. Tops:

1. Fabricate of 14-ga. stainless steel, with exposed edges rolled on 1-1/2" diameter radius, and with corners bullnosed.
2. Where tops adjacent to walls or adjoining equipment, turn up 6" and back 1" on 45o angle unless otherwise indicated.

B. Backsplashes: Cove horizontal and vertical corners.

C. Dishtables and Drainboards:

1. Fabricate of 14-ga. stainless steel with exposed edges formed into 1-1/2" x 190o rolled rim approximately 3" high.
2. Provide built-in pitch of 1/2" min.

3. Provide 8" high backsplashes with 2" return on 45o angle or 1-1/2" dia. rolled rim, as indicated.
4. Construct front rim and backsplash on drainboards with continuous level plane with sink it adjoins.
5. Support drainboards up to 36" in length by 1" dia. stainless steel tube welded to underside of drainboard and leg gusset.
6. Support drainboards 36" and longer with legs; space legs maximum 48" on center.
7. Cove horizontal and vertical corners with min. 3/4" radius.

D. Framing:

1. Mount tops on 1-1/2" x 1-1/2" x 1/8" galvanized angle iron, or 4" wide x 12-ga galvanized channels.
2. Mount dishtables and drainboards on 4" wide x 14-ga stainless steel channels.
3. Run framework around entire perimeter of unit, and cross brace on 30" centers.
4. For dishtables and drainboards, run framing from front to back at each leg location, and run additional channel lengthwise, located at center of table width and welded with 1/4" studs welded at approximately 12" o.c.
5. Provide each stud with suitable chrome-plated lock washers and cap nuts, and make stud lengths such that cap nuts made up tight bringing top down snugly to framing.

E. Legs and Cross Rails:

1. Construct legs of 1-5/8" OD x 16-ga. stainless steel tubing, with fully enclosed stainless steel bullet shaped adjustable foot with min. adjustment of 1" up or down without any threads showing.
2. Fasten legs to 4" high stainless steel gusset with top completely sealed by means of stainless steel plate.
3. Weld gusset continuously to bottom of unit framing.

F. Drawers:

1. Lift-out type drawer body, one-piece 20" x 20" x 5" die stamped of 20-ga. stainless steel, with inside radiused corners.
2. Construct front of double pan stainless steel, 16-ga. exterior and 20-ga. interior.
3. Provide lock for each drawer.
4. Fasten drawer suspension guides to 18-ga. stainless steel housing suspended from angle framing under fixed top.

G. Cabinet Bodies:

1. Construct of 20-ga. stainless steel, with end panels formed with round corners for free standing units, and square corners for fixtures which adjoin walls or other fixtures.

2. Provide 90° retentions on end panels at front and rear, turned in toward body of cabinet and welded for reinforcement.
3. For cabinets with open shelving, provide double wall inner panels.
4. Weld ends to horizontal angle or channel members to form integral cabinet base.
5. Provide backs of same material as ends, with vertical edges turned into match edges of ends.
6. Weld making flush joint.

H. Inserts:

1. Where cold pans and other inserts installed in cabinet bases, provide apron full depth of insert and of same material as bodies with reinforced openings as required.
2. Form in openings on all sides.

I. Sliding Doors:

1. Construct of 20-ga. stainless steel with edges formed into channel extending around all sides, forming doors 7/8" thick.
2. Insert sound deadening material, and enclose with stainless steel back panel with welded corner joints.
3. Mount doors on sliding door hardware.
4. Construct doors to be removable for cleaning purposes, and provide with stops.
5. Provide on each door, recessed stainless steel pulls, and locks.

J. Hinged Doors:

1. Construct same as sliding doors.
2. Mount on stainless steel continuous type hinges, fitted with stainless steel pulls, magnetic catches, and locks.
3. Construct so that door face flush with cabinet body.

K. Shelves: Construct of 14-ga. stainless steel.

1. Bottom Shelves: Extend forward and turn down at front flush with front facing of cabinet.
2. Fixed Intermediate Shelves: Weld to front stiles and to 14-ga. stainless steel brackets so shelf is 1" away from back and ends of cabinet.
3. Adjustable Shelves: Channel on all 4 sides, weld corners, and mount on removable stainless steel standards.
4. Open Base Shelving:
 - a. Construct with edges rolled down on open sides, and 2" turn up with 3/4" radius on rear and ends where adjacent to walls and other equipment.
 - b. Neatly notch corners and weld to legs.
 - c. Reinforce shelving longitudinally with 14-ga. formed channel welded to underside.

- d. Construct removable shelves as above, but fit over cross rails.
 - e. Do not exceed shelving sections of 30" long; where one section abuts another, turn down edges 1".
5. Wall Shelves:
- a. Construct with 1-1/2" roll on front and exposed ends, and with 2" turn up on back and ends where adjacent to walls or other fixtures.
 - b. Weld all corners.
 - c. Construct wall brackets of 14-ga. stainless steel with 1-1/2" flange at wall and completely welded to underside of shelf.
 - d. Fasten each bracket to wall with min. of two, 1/2" bolts anchored to wall.
 - e. Fasten shelf to wall bracket by means of studs welded to shelf, and secure with lock washer and chrome-plated cap nuts.
 - f. Install so that shelf sets 1-1/2" away from wall.
6. Overshelves:
- a. Set shelves mounted over equipment not adjacent to walls on 1" x 14-ga. stainless steel tubular standards fitted with stainless steel base flanges.
 - b. Completely weld top of tubular standard to 14-ga. stainless support channels, run channels full width of overshelf.
 - c. Run 1/2" steel tension rods through counter tops and reinforcing angle framing, secure with nuts and lock washers to assure stable sway-free structure.
 - d. Where shelves mounted over drainboards or dishtables, mount on upturned rolled edges omitting flanges, and scribe lower end of tube to match contour of roll.
- L. Sinks (Pre-Rinse, Pot Wash, Meat and Vegetable Preparation):
- 1. Fabricate from 14-ga stainless steel with interior corners rounded to 1" radius, both horizontally and vertically, forming cove in bottom.
 - 2. Construct with butt edge joints, welded and ground smooth so no evidence of welding appears.
 - 3. Provide 8" high backsplashes with 2" return on 45° angle or 1-1/2" dia. rolled rim, as indicated.
 - 4. Divide multiple compartment sinks with double wall 14-ga stainless steel partitions rounded to 1/2" radius on top and having corners rounded same as other corners in sinks, continuously welded in place with welds ground smooth and polished.
 - 5. Provide back, bottom, and front of one continuous piece with no overlapping joints or open spaces between compartments.
 - 6. Pitch bottom of each compartment, and crease to die-stamped recess to receive lever type drain, without use of solder, rivets, or welding.

7. Furnish each compartment with one each lever operated waste tail piece.
8. Finish front and exposed ends of sink with 1-1/2" 190° rolled edge.
9. Finish back and ends adjacent to walls or other fixtures with splashback.
10. Punch back splashback to receive wall-mounted faucets; Holes to be 8" on center.
 - a. Punch two holes (one set) for one and two compartment sinks.
 - b. Punch Four holes (two sets) for three and four compartment sinks.
11. For sinks in worktops, construct as above but omit roll edges and splashbacks; fabricate bowls flush with work surface.

M. Cold Pans:

1. Fabricate from 14-ga. stainless steel lining and 20-ga. stainless steel casing.
2. Cove interior horizontal and vertical corners.
3. Insulate sides, end and bottoms, with material thermally equal to 2" of fiberglass insulation.
4. Sweat 1/2" dia. copper cooling coils to underside of cold pan, and seal in thermoplastic material.
5. Turn down counter top 1" into pan.
6. Install completely concealed 1" wide plastic breaker strip.
7. Install 1" chrome plated drain with plug.
8. Provide 1/2" high false bottom of 14-ga perforated stainless steel in removable sections.

2.4 REFRIGERATION EQUIPMENT

- A. General: Provide refrigeration condensing units of size and capacities indicated, consisting of compressors, condensers, receivers, motors, mounting bases, vibration isolators, refrigeration components, safety devices, electrical controls, refrigerant and protective controls; all factory assembled and tested.
- B. Refrigerant:
1. Precharge units with refrigerant.
 2. Provide quick-connect type piping connections to receive piping from evaporator coils.
- C. Outdoor Mounting: Provide weather-tight housing and low ambient controls for units mounted outdoors.
- D. Refrigerant Piping:
1. Type ACR copper tubing, hard temper, with wrought fittings and silver solder joints.
 2. Insulate suction lines with 1/2" thick premolded foamed plastic insulation.

- E. Electrical Wiring: Provide required wiring between electrical rough-in and refrigeration units for proper operation.
- F. Plumbing Piping: Provide required water and drain piping between plumbing rough-in and refrigeration units for proper operation.
- G. Refrigeration Specialties:
 - 1. Provide as indicated refrigerant dryer, liquid line solenoid valve, suction line filter, and expansion valve.
 - 2. Provide pump down control circuits consisting of thermostat and solenoid valve.
 - 3. Maintain box temperature from thermostat and liquid line solenoid valve, control compressor from suction pressure.
- H. Condensate Drain Lines:
 - 1. Type ACR copper tubing, hard temper, with wrought fittings and silver solder joints.

III. PART 3 - EXECUTION

3.1 INSPECTION

- A. Rough-In Work:
 - 1. Installer examine roughed-in mechanical and electrical services, and installation of floors, walls, columns and ceilings, and other conditions under which food service work installed; verify dimensions of services and substrates before fabricating work.
 - 2. Notify Contractor of unsatisfactory locations and dimensions of other work, and of unsatisfactory conditions for proper installation of food service equipment.
 - 3. Do not proceed with fabrication and installation until unsatisfactory dimensions and conditions corrected in manner satisfactory to Installer.

3.2 INSTALLATION

- A. General: Set each item of non-mobile and non-portable equipment securely in place, level and adjust to correct height.
 - 1. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation.
 - 2. Conceal anchorages where possible.
 - 3. Adjust counter tops and other work surfaces to level tolerance of 1/16" max. offset, and max. variation from level or indicated slope of 1/16" per ft.

4. Where indicated, or required for safety of equipment operator, anchor equipment to floor or wall.
 5. Where equipment indicated anchored to floor, provide legs with adjustable flanged foot.
 6. Install 2 anchors on each foot.
- B. Field Joints:
1. Complete field-assembly joints in work (joints which cannot be completed in shop) by welding, bolting-and-gasketing, or similar methods indicated.
 2. Grind welds smooth and restore finish.
 3. Set or trim gaskets flush, except for "T" gaskets as indicated.
- C. Enclosed Spaces: Treat spaces inaccessible after equipment installation, by covering horizontal surfaces with powdered borax at rate of 4-oz. per sq. ft.
- D. Closure Plates and Strips: Install where required, with joints coordinated with units of equipment.
- E. Cut-Outs: Provide cut-outs in food service equipment where required to run plumbing, electric, gas, or steam lines through equipment items for final connections.
- F. Sealants and Gaskets:
1. Install all around each unit to make joints airtight, watertight, vermin-proof, and sanitary for cleaning purposes.
 2. In general, make sealed joints min. 1/8" wide, and stuff backer rod to shape sealant bead properly, at 1/4" depth.
 3. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint.
 4. At internal-corner joints, apply sealant or gaskets to form sanitary cove, min. 3/8" radius.
 5. Provide sealant-filled or gasketed joints up to 3/4" joint width; metal closure strips for wider joints, with sealant application each side of strips.
 6. Anchor gaskets mechanically or with adhesives to prevent displacement.
- G. Piping:
1. Install necessary piping from relief valves on kettles and steamers to exhaust in manner to avoid steam coming in contact with operating personnel, and in accordance with applicable codes.
 2. Install required piping from indirect drain connections to floor drains.

3.3 FIELD QUALITY CONTROLS

A. Testing:

1. Delay start-up of food service equipment until service lines tested, balanced, and adjusted for pressure, voltage, and similar considerations; and until water and steam lines cleaned and treated for sanitation.
2. Before testing, lubricate each equipment item in accordance with manufacturer's recommendations.
3. Test each item of operational equipment to demonstrate that it is operating properly, and that controls and safety devices are functioning.
4. Repair or replace equipment found defective in operation, including units below capacity or operating with excessive noise or vibration.

3.4 CLEANING

- A. After completion of installation, and completion of other major work in food service areas, remove protective coverings, if any, and clean food service equipment, internally and externally.
1. Restore exposed and semi-exposed finishes to remove abrasions and other damages; polish exposed-metal surfaces and touch-up painted surfaces.
 2. Replace work not successfully restored.
- B. Prior to date of Final Acceptance on food service equipment work, buff exposed stainless steel finishes lightly, using power buffer and polishing rouge or grit of No. 400 or finer.
- C. Final Cleaning: After testing and start-up, and before time of Final Acceptance, clean and sanitize food service equipment, and leave in condition ready for use in food service.

3.5 CLOSEOUT PROCEDURES

- A. Provide services of Installers technical representative, and manufacturer's technical representative where required, to instruct Owner's personnel in operation and maintenance of food service equipment.
- B. Schedule training with Owner, provide at least 7-day notice to Contractor and Architect/Engineer of training date.
- C. Provide instructional video tapes for Owner's permanent library describing operation and maintenance of each piece of equipment where specified.

3.6 SCHEDULE OF FOOD SERVICE EQUIPMENT

1. Walk-In Cooler/Freezer

Cooler/Freezer; Size as shown on drawings:

- a. Size of Unit: Size and shape indicated on drawings; unit size shall provide no less than 1" and more than 2" clearance between exterior face of unit and surrounding masonry walls.
- b. Unless noted otherwise height of unit to be 8'-6" from floor to ceiling.
- c. Construction: Unit shall be designed and constructed to be completely self supporting; reliance on interior beams or columns, or support from building structure not acceptable.
- d. Interior:
 - 1). .040" natural embossed aluminum
 - 2). 2 coats white baked enamel on ceiling for light reflection
- e. Exterior:
 - 1). Concealed: .040" natural embossed aluminum.
 - 2). Exposed: 20-ga. #304 stainless steel with #3 finish.
- f. Floor:
 - 1) Min. 14 Gage treadbrite aluminum, set in recessed pad. Surface of unit floor to be level with adjacent Kitchen finishing flooring (surface of quarry tile).
- g. Door: Unit to be fitted with standard doors of size indicated, swing type hinged (hinged as shown) entrance doors, flush mounted, in-fitting type with finish, thickness and construction the same as for panels and equipped with the following:
 - 1) Sizes: 34" x 78" clear opening.
 - 2) Adjust to accommodate recessed walk-in.
 - 3) Adjustable wiper sweeper gaskets.
 - 4) Built-in dial thermometer (read-out range: -40oF to +120oF) each door unit.
 - 5) Anti-condensate heaters around door perimeter, stainless steel buck strip for magnetic gasket, anti-condensate heater around perimeter of freezer jamb, and backup plates.
 - 6) Freezer door to have heated pressure relief vent.
 - 7) Cylinder lock and one exterior door closer.
 - 8) Positive action hydraulic door closer.
 - 9) Interior emergency release.
 - 10) Hinges; 3 each, 9" modified strap, cam-lift, self closing type with door lift-off capability.
 - 11) Furnish each door with FS-102, Thermo Curtain.
 - 12) Lower half of each door to have flush 36" high treadbrite aluminum diamond-tread kick plate on each side.
- h. Insulation: Nominal 4" self-extinguishing 2-1/4 lb. density polyurethane foam, .12 "k" factor.
 - 1) Remain stable up to intermittent temperatures of 200°F.
 - 2) Only CFC-free foam insulation acceptable.
- i. Panels: Tongue and groove mating edges with lever activated eccentric on fasteners anchored to metal skins prior to insertion of foam.

- j. Cam fastener: Fan/metal type.
 - 1) Furnish common interior wall between cooler and freezer.
 - 2) Provide reinforcing as required to support ceiling mounted evaporators.
 - 3) Furnish freezer section with indoor pressure relief port.
- k. Trim: Where exposed portions of cooler/freezer abut other materials (concrete block and gypsum board) furnish and install metal trim of type and size indicated:
 - 1) Metal: 1/8" extruded aluminum.
 - 2) Shape and Size: Angle of size required to cover gap, min. of 3" X 3".
 - 3) Finish: Clear anodized.
- l. Lighting: Provide vapor proof fluorescent lights as indicated, constructed for low temperature applications, as necessary to provide min. of 20 footcandles of lighting throughout each section.
 - 1) Cooler: Provide one vapor proof light factory mounted on interior face of cooler above door. In addition to this light provide two (2) each 4'-0", dual bulb fluorescent light fixture.
 - 2) Freezer: Provide one vapor proof light factory mounted on interior face of cooler above door. In addition to this light provide five (5) each 4'-0", dual bulb fluorescent light fixture.
 - 3) Prewire with switch and pilot light outside each external door.
- m. Alarms: Provide each unit with temperature sensor thermostat to give dry contact closure to the alarm system when temperature falls below a pre-determined level.
- n. Refrigeration: Provide refrigeration equipment of size indicated unless larger size required to maintain design temperatures indicated.
 - 1). Cooler: 1-1/2 HP air cooled semi-hermetic, Coplomatic compressor with matching BTU-HR Bohn coil; design system to provide constant temperature of 35 degrees F.
 - 2). Freezer: 5 HP air cooled semi-hermetic, Copelomatic compressor with matching BTU/HR Bohn coil; design system to provide constant temperature of -10 degrees F.
 - 3). Evaporator Coil: Provide low profile evaporator coil.
 - 4). Refrigerant Media: Freon 22 for cooler, freon 404 for freezer (freon 12 not acceptable).
 - 5). Remote refrigeration systems with control kits including expansion valve, sight glass and dehydrator with freezer, drain line heater, thermostatic control pump-down cylinoid timer, low ambient kit, and hinged unit exterior housing cover.
 - 6). Insulation: Insulation on refrigerant and suction piping to be a min. of 1" thick.
 - 7). Wire freezer evaporator coil through compressor.
 - 8). Equipment supplier to complete all necessary refrigeration hook-ups.
 - 9). Provide heater tape on condensate line in freezer and run line to exterior of walk-ins.
- o. All components: NSF and UL approved.
- p. Wiring installed by Electrical Installer.
- q. Provide instructional video tape on operation and maintenance.

- r. Approved manufacturers subject to conformance with above specifications
 - 1). Kolpack
 - 2). Thermo Kool
 - 3). Bally
- s. Five (5) year compressor warranty.

2. Cooler/Freezer Shelving

- a. Acceptable manufacturers:
 - 1). InterMetro Industries Corp. Metroseal; Super Adjustable Metroseal III.
 - 2). Eagle Group (Metal Masters)
 - 3). Advance Tabco
- b. Shelves: 4 shelves per unit.
 - 1). Length between Supports: Max. 48" length; provide combination of lengths required for efficient layout and maximum support without sagging.
 - 2). Depth of Units: 21" unless noted otherwise.
 - 3). Epoxy coated welded steel wire shelves with wire trussed edges.
 - 4). Tubular steel corners sized to fit vertical post supports.
- c. Posts: 74-5/8" high.
 - 1). Epoxy coated steel tubing grooved and numbered at 1" intervals to provide 1" adjustment of shelves.
 - 2). Leveling bolt and glide.
 - 3). Provide four posts per section of shelves
 - 4). Corner release system.
 - 5). Set on minimum 2" x 2" x 1/4" stainless steel pad at floor.
- d. Warranty:
 - 1) Manufacturer to furnish 12 year warranty against corrosion (rust).

3. Dunnage Racks

- a. Acceptable manufacturers:
 - 1). InterMetro Industries Corp. Super Erecta System, Model MHP53S.
 - 2). Eagle Group (Metal Masters)
 - 3). Advance Tabco
 - 4). Market Forge
- b. Platform; Size: 24"x 36".
- c. Welded stainless steel wire shelves with edges fitted over tubular stainless steel frame.
- d. Four (4) 5" dia. ball-bearing swivel casters, two (2) with brakes.

4. Mobile Receiving Table

- a. Mobile receiving table, size 2'-0" wide x 5'-0" long x 2'-10" high to the working surface.
- b. Top of 14-gauge polished stainless steel having 2" wide rolled down edges with bull-nosed corners, reinforced with 12-gauge steel channels.
- c. Mounted on malleable iron flanges on 1-5/8" o.d. steel legs shall have 5" casters, two with brakes, flat top and cross rails.
- d. 16-gauge stainless steel undershelf turned down 1-1/2" and hemmed 3/4" shall be supported to legs by being notched at corners and bolted in a concealed manner with brackets.
- e. Drawers: 20-gauge stainless steel.

5. Mobile Pot Rack

InterMetro Industries Corp. Model N536EBR

- a. Shelves: 5 shelves per unit.
 - 1) 24" Deep x 36" Wide
 - 2) Brite finished carbon steel wire shelves with wire trussed edges.
 - 3) Tubular steel corners sized to fit vertical post supports.
- b. Posts: 62" high.
 - 1) Chrome plated steel tubing grooved and numbered at 1" intervals to provide 1" adjustment of shelves.
 - 2) Plastic split sleeve friction shelf supports.
- c. Casters: Four (4) 5" dia. double ball bearing, swivel type, two (2) with brakes.
- d. Approved manufacturers subject to conformance with specified model.
 - 1) Amco Corp.
 - 2) Market Forge Co.
 - 3) Servolift Eastern Corp.
 - 4) Metal Masters

6. Mobile Work Table

- a. Work tables, sizes 2'-6" x 6'-0" x 2'-10" high.
- b. Top of 14-gauge polished stainless steel having 2" wide rolled down edges with bullnosed corners, reinforce with 12-gauge stainless steel channels.
- c. Mounted on stainless steel flanges on 1-5/8" o.d. stainless steel legs. Units shall have 5" casters, two with brakes, flat top and cross rails.
- d. 16-gauge stainless steel undershelf turned down 1-1/2" and hemmed 3/4" shall be supported to legs by being notched at corners and bolted in a concealed manner with brackets.
- e. Provide 20-gauge stainless steel drawers.

7. Ice Maker & Bin

Manitowoc Equipment Works Model SD-1002A on B-970 storage bin.

- a. Air-cooled condenser.
- b. Capacity: 1050 lbs./day at 70° F air and 50° F water temperature.
- c. Storage Bin: One (1) each 710 lb. bin.
- d. 6" adjustable legs.
- e. Approved manufacturers subject to conformance with specified model.
 - 1) Hoshizaki America, Inc.
 - 2) Scotsman
- f. Five (5) year compressor warranty.

8. Mobile Work Table

- a. Market Force Model #HSL4-2460, 2'-0" wide x 5'-0" long x 6'-0" overall height. Unit to be of 16 gauge stainless steel construction. Shelves to be louvered for circulation, uprights to be 1" o.d. stainless steel tubing. Unit to be mounted on four heavy duty swivel casters two with brakes and four bumpers.
- b. Approved equal products manufactured by Metro, Eagle Group/Metal Masters, or Servolift/Piper Products, meeting the above specifications will be acceptable.

9. Microwave Oven

Amana Menumaster Model HDC182

- a. Heavy volume commercial microwave .6 cu. ft.
- b. 1800 watts, 208/240V.
- c. Minimum 11 power levels.
- d. Minimum 100 programmable menu items.
- e. Four-stage cooking option.
- f. Tempered glass door with interior light.
- g. Interior ceramic shelf.
- h. Stainless steel interior.
- i. Removable cleanable air filter.
- j. 3 year warranty.
- k. Other acceptable manufacturers: Panasonic, Hobart.

10. 2- Compartment Vegetable Prep Sink w/ Pre-Rinse Spray

Size and shape shown on drawings.

- a. Fabricate to construction described in Part 2 of this Section.
- b. Counter: 30" X 96".
- c. Sinks: 2'-0" x 2'-6" x 1'-6"; 14 gage stainless steel coved sink with basket drain.
- d. Cross Rails: Provide at sink location.
- e. Drainboard: 30" long each end.
- f. Prepare right sink compartment for Disposal Unit Item #25.
- g. Furnish with stainless steel control brake.
- h. Faucets: T&S Model B-133 with B109 wall bracket, B-156-ADF Add-on Faucet and vacuum breaker.

11. Wall Mounted Shelf**12. Mobile Stand**

- a. Mobile stainless steel heavy duty table, 2'-6" x 2'-0" x 2'-6" high plus 6" additional height for 5" swivel casters, (two with brakes): Table shall have removable S/S slides to hold 1'-6" x 2'-2" bun pans. Servolift/Piper Products #705, Eastern Serv-o-Lift #705-1MOD or equal by Advance Tabco, Duke Manufacturing or Lakeside/Aris.

13. Food Processor

Robot Coupe, USA, Inc. Model R-6VN. Furnish as follows:

- a. Removable, dishwasher safe, all-metal continuous feed attachment with hinged large pusher.
- b. Removable, dishwasher safe, 6 quart stainless steel cutter bowl with handles.
- c. Direct drive, 2 speed fan-cooled motor.
- d. Magnetic safety switch to provide that machine will not operate unless fully and properly assembled. Upon opening the continuous feed lead or removing bowl lid, motor shall shut off.

- e. Unit shall accommodate 21 different processing plates.
 - f. Plates: Provide following processing plates:
 - 1). Slicing Plate C435SA 3/8"
 - 2). Slicing Plate C437SA 3/16"
 - 3). Grating Plate C453GPA 3/16"
 - 4). Julienne Blade C438JA 1/4"
 - 5). All-purpose dicing Grid C426D
 - g. Provide instructional video tape on operation and maintenance.
 - h. Approved Manufacturers subject to conformance with specified model.
 - 1). Hobart Corp.
 - 2). G. S. Blakeslee & Co.
 - 3). Globe
 - 4). Berkel, Inc.
- 14. Mobile Slicer Stand**
- a. Mobile stainless steel heavy duty table, 2'-6" x 2'-0" x 2'-6" high plus 6" additional height for 5" swivel casters, (two with brakes): Table shall have removable S/S slides to hold 1'-6" x 2'-2" bun pans. Servolift/Piper Products #705, Eastern Serv-o-Lift #705-1MOD or equal by Advance Tabco, Duke Manufacturing or Lakeside/Aris.
- 15. Slicer**
- Hobart Corp. Model 2712E with standard accessories and following:
- a. Tubular chute for random slicing.
 - b. Approved Manufacturers subject to conformance with specified model.
 - 1). G. S. Blakeslee & Co.
 - 2). Berkel, Inc. (Model X13E)
 - 3). Globe (Model #2750)
 - c. Vegetable chute with pusher.
 - d. Slaw tray.
- 16. Mobile Work Table**
- a. Work tables, size 2'-6" x 6'-0" x 2'-10" high. Top of 14-gauge polished stainless steel having 2" wide rolled down edges with bullnosed corners, reinforced with 12-gauge stainless steel channels. Mounted on stainless steel flanges on 1-5/8" o.d. stainless steel legs. Shall have 5" casters, two with brakes, flat top and cross rails. Heavy gauge stainless steel undershelf shall be supported to legs by being notched at corners and bolted in a concealed manner with brackets.
 - b. Mount the drawers on 6" high adjustable stainless steel legs. The balance of the table shall be mounted on standard stainless steel legs with cross rails. Omit the front cross rail.
 - c. Provide a stainless steel shelf at 10" a.f.f.
- 17. Two-Tier Stainless Steel Wall Mounted Shelf**
- a.

18. Hose Reel

T&S Brass and Bronze Works, Inc. "Reel Kleen" Model B-1400.

- a. Reel: Fully enclosed, automatic stop and retraction type.
- b. Hose: 75' long 3/8" ID.
- c. Accessories:
 - 1) B-1420 quick connect squeeze valve.
 - 2) B-1421 spray quick connect.
 - 3) B-1422 jet spray.
 - 4) B-1423 fan spray.
 - 5) B-1424 hook nozzle.
 - 6) B-963 vacuum breaker.
 - 7) RK-2 shut-off valve.
 - 8) B-513 mixing valve.
 - 9) C-CVV-1/2" horizontal check valve.
- d. Approved manufacturers subject to conformance with specified model.
 - 1) Fisher
 - 2) Chicago Faucet

19. Double Deck Convection Oven

- a. Furnish two (2) each gas, deep depth, double convection ovens, Model Number MCO-GD-20-S as specified as manufactured by Garland.
- b. Provide unit with all stainless steel front, sides, top and legs.
- c. Provide unit with porcelain oven interior, 60/40 doors with double paned thermal windows, interior lighting, electronic spark ignition and 2-speed 3/4 hp fan motor.
- d. Provide unit with Master 200 solid-state control panel with 150-degree F. to 500-degree F. temperature range and mechanical controls.
- e. Provide "fail-safe" door that stops the fan when the oven door is opened more than 3" while the oven is operating.
- f. Provide unit with 6" stainless steel legs.
- g. Provide 28" deep interior oven depth.
- h. Each oven to be provided with thirteen position rack guides and six oven racks.
- i. Each oven to be rated at 60,000 BTU/HR.
- j. Unit to be designed for natural gas. Control voltage is 115/60/1.
- k. Unit to be UL listed and NSF certified.
- l. Provide manufacturer's standard one (1) year parts and labor warranty and five (5) year limited door warranty.
- m. Products manufactured by Southbend are acceptable.

20. 6- Burner Range w/ Oven

- a. Southbend Model 336D, six burner surface unit on commercial gas oven.
- b. Operation, Natural gas, 26,000 BTU burners, 32,000 BTU oven. Provide gas connection to rear of unit.
- c. Essentially similar products by Wolf Range, Vulcan-Hart and Garland are acceptable.
- d. Casters - all swivel - front with locks.
- e. Stainless steel front and shelf, galvanized sides.

21. Range Mounted Salamander Broiler

- a. Southbend Model P36-CM.
- b. 40,000 BTU, (4) 10,000 BTU infrared burners.

- c. 430 stainless steel #3 polish exterior.
- d. Additional acceptable table manufacturers: Garland, Wolf Range, Vulcan-Hart.
- e. Provide 2 year warranty on operations parts.
- f. Range mount interpiping of gas connection to sectional range base.

22. Mobile Grill Stand

- a. Southbend # HDCS-36 counterline stand.
- b. Stainless Steel with 2" SS tubular legs with adjustable casters.

23. Char broiler

- a. Southbend # HDC-36.
- b. Acceptable manufacturers: Garland, Wolf Range, Vulcan-Hart.
- c. 20,000 BTU burners every 6".
- d. Stainless steel front and sides, aluminized steel rear and bottom.
- e. Reinforced, insulated double wall sides.
- f. Cast iron radiants.
- g. 5" high rear and side splash guards.

24. Flat Griddle

- a. Southbend # HDG-36.
- b. Acceptable manufacturers: Garland, Wolf Range, Vulcan-Hart.
- c. 30,000 BTU burner per 12".
- d. Electronic spark ignition.
- e. Stainless steel front, vent, legs and sides; Aluminized steel rear and bottom.
- f. 5" high rear and side splash guards.
- g. Reinforced, insulated double wall sides.
- h. Insta-on thermostatic controls.
- i. Fully welded 1" thick SS griddle plate with grease drawer.

25. Mobile Work Table

- a. Mobile work tables, size 2'-6" x 2'-0" x 2'-10" high. Top of 14-gauge polished stainless steel having 2" wide rolled down edges with bullnosed corners, reinforced with 12-gauge stainless steel channels. Mounted on stainless steel flanges on 1-5/8" o.d. stainless steel legs. Shall have 5" casters, two with brakes, flat top and cross rails. Heavy gauge stainless steel undershelf shall be supported to legs by being notched at corners and bolted in a concealed manner with brackets.
- b. Mount the drawers on 6" high adjustable stainless steel legs. The balance of the table shall be mounted on standard stainless steel legs with cross rails. Omit the front cross rail.
- c. Provide a stainless steel shelf at 10" a.f.f.

26. Deep Fat Fryer

- a. Furnish one (1) each fryer consisting of one (1) each gas, high efficiency floor model fryer Model Number P16-PF45 with a filter system as specified as manufactured by Southbend.
- b. Acceptable manufacturers are Frymaster and Keating.
- c. Provide stainless steel pot, door and cabinet.
- d. Provide open frypot design allowing for easier access to frypot for cleaning, more precise location of thermostat and greater reliability and consistency.

- e. Provide fryer with a 50 pound shortening capacity and a 14" x 15" frying area.
- f. Turbo jet infrared burners are rated at 80,000 BTU and are designed for high volume fraying with maximum fuel efficiency. The solid-state controller assures pinpoint accuracy of shortening temperature extending shortening life and producing a uniformly cooked product.
- g. Fryer shall be equipped with rack-type gasket support, basket hanger and two (2)-twin size wire mesh fry baskets.
- h. Footprint filter system fits underneath the fryer requiring no additional floor and storage space.
- i. Unit to be designed for natural gas. Control voltage is 115/60/1.
- j. Provide the unit with the following accessories:
 - 1). Stainless Steel Frypot cover
 - 2). Casters - Set of Four
 - 3). 48" Quick Disconnect Hose with Restraining Device
 - 4). 36" flue risers
- k. Unit to be NSF, AGA, and CGA approved.
- l. Provide manufacturer's standard (1) year parts and labor warranty and a seven (7) year parts and labor warranty on stainless steel frypot.

27. 30-Gallon Tilting Skillet

- a. Furnish one (1) each gas, manual, 30-gallon tilting skillet Model Number SGL-30-T1 as specified as manufactured by Cleveland. Total exterior perimeter dimensions to be sized properly in order that unit fits in available space.
- b. Provide 12-gauge Type 304 stainless steel pan construction.
- c. Provide "splash-proof" controls and construction, spring-assist cover with full width handle and vent, electronic spark ignition, and adjustable electronic thermostat to accurately control temperature from 100 degrees to 450 degrees.
- d. Provide high efficiency gas-fired, forced air, power burner gas combustion system with dual power settings of 160,00 BTU or 200,000 BTU for superior heat up and recovery.
- e. Provide 10-degree cooking feature allowing the pan to be tilted 10 degrees without the burners being turned off.
- f. Provide gallon etch marks at 5-gallon increments. Provide rear flanged feet.
- g. Rim of pan to be no more than 35" above finished floor for easier product handling and clean up.
- h. Unit to be supplied with gas pressure regulator and cord and plug for 115-volt controls.
- i. Unit to be designed for natural gas.
- j. Provide the unit with the following accessories:
 - 1). TD2SK 2" Tangent Draw-Off
 - 2). DPK13 Double Pantry Faucet
 - 3). PCS Pan Carrier
 - 4). FSSK Food Strainer
- k. Unit to be NSF, AGA, and CGA approved.
- l. Provide manufacturer's (2) year parts and labor warranty.
- m. Products manufactured by Vulcan #VG30 or Groen if modified to meet this specification are acceptable.

28. Kettle Stand

- a. Furnish 12-gallon Modular Equipment Stand ES-28, as manufactured by Cleveland.
- b. Approved equal products by Groen or Market Forge.
- c. Stainless steel with adjustable feet.
- d. Re-moveable combo drain drawer with splash shield and pan support.

29. 12-Gallon Tilting Kettle

- a. Furnish 12-gallon (minimum working capacity) tilting steam jacketed kettle Model KGT-12-TGB mounted on Modular Equipment Stand ST-28, both as manufactured by Cleveland.
- b. Unit to be designed for natural gas and to be ASME, AGA, CGA, NSF and UL Approved.
- d. Provide rear gas connection.
- e. Provide manufacturer's standard three year parts and labor warranty on kettle.
- f. Approved equal products by Groen or Vulcan-Hart.

30. Mobile Baker's Table

- a. Baker's table, size 2'-6" x 6'-0" x 2'-10" high to the working surface. Top shall be constructed of 14-gauge stainless steel having a special roll rim on the front, back and both ends. **Provide two Rolling Bins each table, see Item #6.**
- b. On the left end of the unit, below the top, furnish a tier of three standard drawers with enclosure. Drawers to be equipped with removable stainless steel liners.
- c. Extend the back uprights on the table up to 6'-6" above the floor with the last 12" arched in a 12" radius toward the front of the tables. Weld to the end of this upright a 2" wide x 14-gauge stainless steel bar. Spaced on the bar on 6" centers shall be double pointed stainless steel removable pot hook.
- d. Mount the drawers on 6" high adjustable stainless steel legs. The balance of the table shall be mounted on standard stainless steel legs with cross rails. Omit the front cross rail. Units shall have 5" casters, two with brakes, flat top and cross rails.

31. 30-Quart Mixer

- a. Provide 30 quart all purpose mixer, Hobart, with variable speed motor, gear driven transmission, 15-minute timer, taper attachment hub, stainless steel bowl guard, manual bowl lift, SS bowl, "B" flat beater, wire whip, "ED" dough hook and all standard accessories.
- b. Acceptable manufacturers are Berkel and Globe.
- c. 5 speed, 2 hp.

32. Mobile Heater Proofing Cabinets

- a. Metro Model C599-SDS-4 with exterior and interior aluminum finish, full compliment universal guides on 3" casters, four corner bumpers, door mounted thermometers and four swivel casters, two with brakes, and shall have dry and moist heat systems. Electrical, 120 volts, 60 hertz, one phase.
- b. Approved equal products by Belshaw, Lakeside/Aris, Servolift/Piper Products or Winston shall be acceptable.

- 33. 4- Compartment Pot Sink w/2 faucets**
Size and shape shown on drawings.
- a. Fabricate to construction described in Part 2 of this Section.
 - b. Stainless steel pot sinks: 2'-6" x 2'-6" x 1'-2".
 - c. Drainboard: 36" long each end.
 - d. Faucets: T&S Model B0231; 2 each with vacuum breaker, 062X 12" swing nozzle, B-FT steam regulator, lever handles and hose connection. Approved equals by Chicago and Fisher.
 - e. Install pots washers where shown on plans.
- 34. Wall Mounted Shelf**
- a.
- 35. Undercounter Dishwasher**
- a. Champion Model UH-100B under counter high temperature dishwashing machine with built-in booster heater.
 - b. Acceptable manufacturers are Jackson and Hobart.
- 36. Dry Storage Shelving**
InterMetro Industries Corp. Metroseal; Super Adjustable Metroseal II.
- a. Shelves: 5 shelves per unit.
 - 1) Length between Supports: Max. 48" length; provide combination of lengths required for efficient layout and maximum support without sagging.
 - 2) Depth of Units: 21" unless noted otherwise.
 - 3) Epoxy coated welded steel wire shelves with wire trussed edges.
 - 4) Tubular steel corners sized to fit vertical post supports.
 - b. Posts: 86-5/8" high.
 - 1) Epoxy coated steel tubing grooved and numbered at 1" intervals to provide 1" adjustment of shelves.
 - 2) Leveling bolt and glide.
 - 3) Provide four posts per section of shelves
 - 4) Corner release system.
 - 5) Manufacturer to furnish lifetime warranty against corrosion (rust).
- 37. Mobile Ingredient Bins**
- a. Rubbermaid No. 3602 portable floor bins with split tops and swivel casters to fit under Baker's table. Approved equals by Cambro and Carlisle.
- 38. Pot Washer**
- a. Stainless steel Pot Sink.
 - b. Furnish two T&S Model B-231-BST faucets each unit. Approved equals by Chicago and Fisher.
 - c. Install sink heater and pots washers where shown on plans.
 - d. Furnish and install Kewanee Model #K-99, 1/4 HP, 120/60/1 electrical service or approved equals by Wells or Salvajor.

END OF SECTION

SECTION 15 100

PLUMBING

PART 1 - GENERAL

1.1 CODES

- A. Work covered by this section of the specifications shall conform to The Standard Plumbing Code, 2006 Edition with 2007 Revisions, NFPA 54 , the National Fuel Gas Code, 2000 Edition and the Standard Gas Code, 2006 Edition with 2007 Revisions.

1.2 SHOP DRAWINGS

- A. Where equipment is specified herein or on drawings, by manufacturer's names or numbers, this shall denote minimum requirements as to quality, type, capacity, function and performance. All equipment must have the Engineer's approval before ordering. Submit not less than six (6) copies of submittal data on all equipment and materials.
- B. Submittals shall be bound in a binder with index tabs and shall include a cover sheet for each piece of equipment itemizing equipment features to show compliance with or deviation from the requirements contained in the specifications and drawings.

1.3 OPERATING INSTRUCTIONS

- A. The contractor shall furnish not less than three(3) copies of operating and maintenance instructions for all equipment he has furnished and installed.
- B. All keys, operating manuals, maintenance instructions manuals and parts information shall be turned over to the Gwinnett County Board of Education Director of Construction and a signed receipt obtained.

1.4 INSPECTIONS

- A. The Contractor shall uncover all concealed areas during inspections.
- B. All clean-outs shall be opened for final inspection and then reclosed.
- C. TV camera inspection of all interior and exterior storm and sanitary sewer lines shall be made with the owner present. All lines shall be inspected and recorded at the end of the project. Interior lines shall be inspected and recorded before slab is poured.

1.5 WARRANTY PARTS

- A. Freight on all warranty parts shall be prepaid.

1.6 UTILITY CONNECTIONS

- A. Connect to existing utilities at the locations shown on the drawings.

1.7 TRENCHING, BEDDING AND BACKFILLING

- A. All excavation and backfill for work under this section shall be in accordance with Division 2, Site Work.

1.8 TEST

- A. The soil, waste and vent lines of the sanitary systems shall be tested with water at ten feet of water head pressure for 15 minutes or with air at 5 psi for 15 minutes.
- B. The domestic water piping shall be tested at 150 psi for 30 minutes.
- C. The gas piping shall be tested at 50 psi air pressure for 2 hours.
- D. All underground and concealed lines shall be tested before the lines are covered.
- E. The Gwinnett County Board of Education shall be notified prior to covering any buried or concealed plumbing to observe the work at their discretion.
- F. TV camera inspection of all interior and exterior storm and sanitary sewer lines shall be made with the owner present. All lines shall be inspected and recorded at the end of the project. Interior lines shall be inspected and recorded before slab is poured.

1.9 DISINFECTION

- A. All domestic water piping shall be disinfected with chlorine before it is placed into operation. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB-C-120 and shall be introduced to the system by experienced operators only. The chlorine solution applied to the piping sections or system shall contain at least fifty parts per million of available chlorine and shall remain in the sections or system for a period of not less than sixteen (16) hours. During the disinfection period all valves shall be opened and closed at least four times. After the disinfection period, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two-tenths parts per million (0.2 PPM). Submit certification to the Architect and Owner that the system was disinfected.

PART 2 - PRODUCTS

2.1 PIPING MATERIAL AND INSTALLATION

- A. All horizontal soil, waste and vent piping of 2" diameter or less shall be installed with a fall of not less than 1/4" per foot. All horizontal soil, waste and vent piping larger than 2" shall be installed with a fall of not less than 1/8" per foot. All piping in finished areas shall be concealed in walls, in pipe chases, or above furred ceilings. Except for fixture connections, reductions in pipe sizes shall be made with reducing tees, reducing ells, or reducing couplings.
- B. Sanitary and storm water piping above grade within the building shall be service weight hubless cast iron pipe and fittings conforming to CISPI 301-90.
- C. Sanitary and storm water piping below grade within the building shall be schedule 40 PVC plastic drainage pipe and fittings conforming to ASTM 2665-88. The joint connecting the PVC pipe to the cast iron pipe above shall be made above the slab in such a manner that no PVC pipe is visible.
- D. Sanitary piping below grade, outside the building where there is a minimum of 7'-0" of cover in paved areas or a minimum of 4'-0" of cover in non-paved areas shall be type SDR-35 PVC drainage pipe and fittings conforming to ASTM D-3034.
- E. Sanitary piping below grade, outside the building where there is less than 7'-0" of cover in paved areas or less than 4'-0" of cover in non-paved areas shall be ductile iron pipe and fittings conforming to ANSI A21.51.
- F. Domestic water service pipe installed under the building floor slab and underground, outside the building, 3" and less shall be Type "K" hard drawn copper tubing with wrought copper solder joint fittings conforming to ASTM B-88-72. Minimum depth of cover outside the building shall be 36".
- G. Domestic water pipe installed under the building floor slab and underground, outside the building, 4" and larger shall be cement lined ductile iron pipe conforming to ANSI A21.51. Minimum depth of cover outside the building shall be 36".
- H. Domestic water piping 2" and smaller, installed under the floor slab shall be Type "K" soft drawn copper tubing installed with no joints under the slab.
- I. Domestic hot and cold water lines within the building, above grade shall be Type "L" hard drawn copper tubing with wrought copper solder joint fittings conforming to ASTM B-88-72.
- J. Gas piping installed above grade shall be schedule 40 black steel pipe conforming to ASTM A-53. Gas piping 2" and larger shall have welded joints with carbon steel weld fittings. Gas piping smaller than 2" may have threaded joints with malleable iron 150 lb. threaded fittings.

- K. Gas piping installed underground shall be schedule 40 black steel pipe covered with a shop wrap consisting of not less than two layers of polyethylene tape with a minimum wrap thickness of 25 mils. All joints and other exposed sections shall be field wrapped with wrap equal to shop wrap.
- L. Gas piping installed underground may also be plastic piping and compatible fittings conforming to ASTM 2513 or reinforced epoxy resin gas pressure pipe and fittings conforming to ASTM D-2517. Plastic or resin gas piping must be installed in accordance with the manufacturer's recommendations and must be buried for its entire length.
- M. Underground gas piping shall be installed a minimum of 18" below the finished grade.
- N. Install warning tapes 12" above all underground piping. Warning tapes shall have a metallic core to make them detectable. Warning tape shall be Brady 91603(blue) for water lines, 91604(green) for sanitary and storm sewer lines and 91600(yellow) for gas lines or approved equal by Seton or T&B Westline. Warning tape shall rise out of the ground and be accessible at the building wall or other outside location.

2.2 PIPE JOINTS

- A. Joints in hubless cast iron soil pipe above grade shall be made with an elastomeric sealing sleeve conforming to ASTM C-564 and with four stainless steel clamps per joint on sizes 2" through 4" and six per joint on sizes 5" and larger conforming to ASTM 310-85.
- B. Joints in hub & spigot cast iron soil pipe shall be made with a compression gasket conforming to ASTM C-564-88.
- C. Joints in schedule 40 PVC plastic pipe shall be made with PVC solvent cement conforming to ASTM D-2564-78.
- D. Joints in type SDR-35 PVC plastic pipe shall be made a compression gasket conforming to ASTM F-477.
- E. Joints in copper pipe shall be made with lead free solder containing only tin-copper-silver or 95-5 tin-antimony.
- F. Joints in copper pipe under the floor slab or underground outside the building in piping 2" and larger shall be made with silver solder or brazed connections.
- G. In lieu of soldered fittings in copper pipe the contractor may substitute Victaulic or Grinnell Gruvlok grooved mechanical couplings Rigid Pro Press system or T-Drill mechanically formed fittings with brazed connections. Each of these systems shall be used in accordance with the manufacturer's published instructions.
- H. Connections of copper pipe to ferrous pipe and/or equipment shall be made with dielectric unions, Watts series 3000, Victaulic or Gruvlok Clearflow or approved equal.

- I. Joints in ductile iron water pipe shall be Tyton joints except that joints at fittings shall be bolted mechanical joints.
- J. Threaded pipe joints shall have American Standard tapered pipe threads properly formed. Pipe joints compound shall be used in making joints.
- K. Welded joints shall be made with the use of electric arc or of acetylene gas. Welding rods shall conform to ASTM Specifications No. A-251. Welding electrodes shall conform to ASTM Specification No. A-233. Welders shall be certified pipe welders that have passed qualification test prescribed by the National Certified Pipe Welding Bureau.
- L. Unions shall be installed in pipe lines at connections to equipment.

2.3 HANGERS AND SUPPORTS

- A. Cast iron underground shall be firmly bedded on the body of the pipe, and bell holes provided at each joint. All piping shall be installed in graded trench. Excavate, backfill, and support piping as hereinbefore specified.
- B. Horizontal runs of cast iron piping installed above ground shall be supported near or at each hub, not including fittings at intervals of not more than 5'0". Hangers shall be B-Line Fig. 3100 standard clevis hanger or approved equal by Grinnell, Michigan or PHD.
- C. Copper piping shall be supported at intervals not to exceed 6'0" for sizes 1-1/2 inch and smaller, and at intervals not to exceed 10'0" for sizes 2 inch and larger, and at each change in horizontal or vertical direction. Hangers shall be B-Line Fig. 3170 adjustable swivel ring hangers or approved equal by Grinnell, Michigan or PHD.
- D. Copper piping in chases shall be secured to the wall with pipe straps or to other piping with lengths strut system channel as manufactured by B-Line, Uni-Strut or Michigan.
- E. Steel piping shall be supported at intervals not to exceed 6'-0" for sizes 1-1/2" and smaller and 10'-0" for sizes 2" and larger and at each change in horizontal or vertical direction. Hangers shall be B-Line Fig. 3100 standard clevis hanger or approved equal by Grinnell, Michigan or PHD. Vertical risers shall be supported at each floor with B-Line Fig. 3373 riser clamp or approved equal by Grinnell, Michigan or PHD.
- F. Hangers shall be supported from building structure by means of beam clamps. Hanger rods shall be standard bolt steel with machine screw threads.
- G. Piping rising through the roof shall be secured to the structure to prevent movement at the flashing or roof curb.
- H. Hangers on insulated piping shall be increased in size to fit over the insulation.

- I. Gas piping installed on the roof shall be supported on Miro Industries pillow block pipestands installed at a maximum of 10 feet on center. The pipestands shall be constructed of polycarbonate resin plastic. Approved equal by MAPA, Pate, RPS or EAS.

2.4 VALVES AND COCKS

- A. Unless specifically indicated otherwise, the valves shall be designed for not less than 125 pounds working pressure. The valves shall be suitable for the service for which they are installed.
- B. Ball valves for copper water lines shall be Milwaukee Fig. BA150 bronze valve with PTFE seat, and sweat ends or approved equal by Apollo, Crane, Hammond, Kitz, Nibco, Stockham or Watts. Ball valves may be substituted for gate valves throughout the system.
- C. Check valves for copper water lines shall be Milwaukee Fig. 1509-S bronze valve with Buna-N disc and sweat ends or approved equal by Apollo, Crane, Hammond, Kitz, Nibco, Stockham or Watts.
- D. Balancing valves for copper water lines shall be Milwaukee Fig. BA150MS bronze ball valve with memory stop PTFE seat, sweat ends or approved equal by Apollo, Crane, Hammond, Kitz, Nibco, Stockham or Watts.
- E. Hose bibbs shall be Woodford No. 84 cast brass hose bibb with chrome finish, lock shield cap, loose key and integral backflow preventor or approved equal by Prier, Mifab, Watts or Zurn. Install 16" above floor under lavatories.
- F. Wall hydrants shall be Jay R. Smith 5509RB freezeproof cast brass self draining wall hydrant with stainless steel box, rough brass finish front and integral backflow preventor or approved equal by Josam, Mifab, Wade, Woodford or Zurn.
- G. Water pressure reducing valves shall be of sizes indicated on the drawings and shall be as manufactured by Watts or approved equal by Wilkins or Hersey. Install 4-1/2" Dia. 0-150 psi pressure gauges with cocks at the pressure reducing valve as indicated on the drawings.
- H. Pressure relief valve shall be Watts No. 53 all bronze non-adjustable relief valve set at 75 PSI or approved equal by Wilkins or Hersey.
- I. Double check valves shall be Watts No. 709-RW or 007-QT as indicated, epoxy coated double check valve with two gate valves and four test cocks. Reduced pressure zone double check valves shall be Watts No. 909-RW or 009-QT as indicated, epoxy coated double check valve with two gate valves and four test cocks. The valve assembly shall be U. L. listed. Approved equal valves by Ames, Apollo, Febco, Hersey or Wilkins are acceptable.
- J. Gas valves 3/4" to 2" shall be Milwaukee BB2-100 bronze butterfly valve with full nominal pipe size disc, Viton seals and threaded ends. Gas valves shall be rated at 125 psi and shall be CSA and UL listed for natural gas service. Approved equal gas valves by Kitz or Nibco are acceptable.

- K. Gas valves 2-1/2" and larger shall be Rockwell-Nordstrom Fig. 143 flanged 2-bolt cover semi-steel valves rated at 175 PSI. Approved equal gas valves by Resun or Milwaukee are acceptable.
- L. Gas pressure regulators shall be Sensus model 143 or 243 as indicated on the drawings or approved equal by Maxitrol or Honeywell.

2.5 TRAP PRIMERS

- A. Trap primers shall be installed at all floor drains.
- B. Trap primers for P-traps shall be Precision Plumbing Products, Inc., Model SP-500-24V electronic trap priming assembly consisting of a solenoid valve rated at 24 volts, 6.3 watts, an air gap and mounting bracket. Omit the 6 foot electric cord. Wiring for trap primers is provided in Section 15500, Direct Digital Control.
- C. Trap primers for floor drains shall be J. R. Smith Fig. 2698 waste water trap primer P-trap. P-trap and supply line shall be chrome plated and fitted with escutcheon plates. Provide this fitting in lieu of standard P-trap at lavatories which prime the floor drains at locations indicated on the drawings.
- D. At floor drains in Mechanical Rooms, Janitors Closets and other spaces where there are no lavatories install ProSet Systems TG33G or TG34G trap guard insert.
- E. Trap primers shall be as manufactured by Josam, J.R.Smith, Mifab, Precision Plumbing, Wade, Watts or Zurn.

2.6 DRAINS

- A. Drains installed in floors with water proofing membrane shall have flashing clamps. Floor drain strainer sizes shall be not less than twice the diameter of the drain outlet. Provide trap primer connections on drains where trap primers are indicated on the drawings. All floor drains except those with trap primers or those on safe waster system in the kitchen shall have deep seal p-traps with a minimum of 4" water seal.
- B. Floor drains shall be as follows:
 - 1. Type A: J. R. Smith 2010B cast iron drain, 6 X 6 square Nickaloy strainer.
 - 2. Type D: J. R. Smith 3101-13 cast iron flanged receptor with 8-1/2" square nickel bronze rim and secured 3/4" grate, acid resistant coated interior, aluminum removable sediment bucket.
 - 3. Type E: J. R. Smith 3200 cast iron flanged receptor with 16-1/2" square nickel bronze rim and secured grate, acid resistant coated interior, aluminum dome bottom strainer.

- C. Roof drains shall be J. R. Smith 1010Y cast iron drain with cast iron dome, underdeck clamp, flashing clamp and gravel stop and no-hub outlet.
- D. Overflow roof drains shall be J. R. Smith 1080 cast iron drain with cast iron dome, 2" high water dam collar, underdeck clamp, cast iron flashing clamp, gravel stop and no-hub outlet.
- E. Approved equal drains as manufactured by Josam, Mifab, Wade, Watts or Zurn will be acceptable.

2.7 CLEANOUTS

- A. Cleanouts in floor slab shall be J. R. Smith 4000 adjustable head, cast iron cleanout with nickel alloy rim and scoriated nickel alloy cover, Speedi-set seal, installed flush with finished floor. Install Fig. 4051 square top cleanouts in tile floors. Install Fig. 4191 in Terrazzo floors. Install Fig. 4031 round top cleanouts in all other floors. Install suffix X adjustable carpet flange on all cleanouts in carpeted floors.
- B. Cleanouts in walls shall be J. R. Smith 4472 cadmium plug and stainless steel cover, installed on hubless cast iron clean-out tee. Cover shall be 2" larger than nominal pipe size.
- C. Cleanouts in exterior, below grade cast iron piping shall be J. R. Smith 4283 cleanout with screwed countersunk brass plug, brought up to grade with cast iron pipe riser and set in 18"x 18" x 6" thick concrete pad.
- D. All cleanouts shall be accessible.
- E. Approved equal cleanouts as manufactured by Josam, Mifab, Wade, Watts or Zurn will be acceptable.

2.8 WATER HAMMER ARRESTERS

- A. Water hammer arresters shall be furnished and installed where indicated on the drawings. Sizes indicated refer to standards established by the Plumbing and Drainage Institute and published in Standard PDI-WH-201. Arresters shall be certified that they conform to this standard.
- B. Water hammer arresters shall be as manufactured by Josam, J.R. Smith, Wade, Sioux Chief, Precision Products or Zurn.

2.9 SLEEVES

- A. Pipe sleeves or core drilled holes shall be provided in all locations where piping passes through concrete floors above grade or masonry or concrete walls not in place before the piping is installed. Sleeves shall be of steel pipe sections.
- B. Where cast iron pipes pass through brick or tile walls, sleeves shall be omitted.
- C. Where cast iron pipes pass through slabs in contact with grade, sleeves shall be omitted.

2.10 FLASHING

- A. All vent piping passing through roof shall be flashed water tight with an EPDM flashing clamp with stainless steel worm clamp manufactured specifically for metal roofs.
- B. Roof drain flashing shall consist of four pound lead extending not less than 12" in all directions from the edge of drain flange. The flashing material shall be placed underneath the roof material and together with the roofing membrane be placed under and attached to drain with flashing clamping ring.
- C. The flashing roof connections shall meet the approval of the roofing material manufacturer, and shall comply with the roof bond requirement.

2.11 INSULATION

- A. All insulation shall have composite maximum flame spread rating of 25 and maximum smoke developed index of 50 as required by NFPA 90A. Accessories, such as adhesives, mastics, cements, or tapes shall have the same component ratings as listed above.
- B. Hot and cold water piping shall be insulated with fiberglass pipe insulation with type ASJ all service jacket with pressure sensitive tape closure system or elastomeric closed cell or polyolefin or polymer foam, all with self-sealing seam and adhesive sealed joints. Each type of insulation shall be installed in accordance with the manufacturer's published instructions. All joints shall be miter cut and sealed. Insulation shall have a k factor not to exceed 0.27 @ 75°F. Insulation shall be 1/2" thick except that insulation on circulating mains, shall be 1" thick.
- C. Exposed fixture connections and piping concealed inside walls or chases shall not be insulated.
- D. Pipe hangers shall be increased in size to fit over insulation. At each pipe hanger install a 12" long, 22 gauge galvanized steel saddle to protect insulation.
- E. Storm water piping, including the roof drain, concealed above ceilings shall be insulated with 1-1/2" thick 0.75 PCF density fiberglass blanket insulation with aluminum foil vapor barrier. All joints and seams shall be sealed with 3" wide aluminum foil tape.

- F. Storm water piping exposed to view shall be insulated with fiberglass pipe insulation with type ASJ all service jacket with pressure sensitive tape closure system or elastomeric closed cell or polyolefin or polymer foam, all with self-sealing seam and adhesive sealed joints. Each type of insulation shall be installed in accordance with the manufacturer's published instructions. All joints shall be miter cut and sealed. Insulation shall have a k factor not to exceed 0.27 @ 75°F. Insulation shall be 1/2" thick. Roof drains shall be insulated with 1-1/2" thick 0.75 PCF density fiberglass blanket insulation with aluminum foil vapor barrier. All joints and seams shall be sealed with 3" wide aluminum foil tape.
- G. Horizontal waste lines above grade which carry condensate shall be insulated with 1-1/2" thick 0.75 PCF density fiberglass blanket insulation with aluminum foil vapor barrier. All joints and seams shall be sealed with 3" wide aluminum foil tape.

2.12 FIXTURE WASTE CONNECTIONS

- A. Waste connections to fixtures shall be as follows:
 - 1. Water closet: For closets on slab on grade, use 4 inch stub with closet floor flange. For wall hung back outlet closets use cast iron carriers as specified. Use pre-formed wax setting ring on floor mounted and neoprene setting ring on wall mounted closets to make joints water and gas tight.
 - 2. Lavatories: 1-1/4" Type M copper tubing with cast brass drainage fittings.
 - 3. Waterless Urinal: 2" Schedule 40 PVC.
 - 4. Sink: 1-1/2" Type M copper tubing with cast brass drainage fittings.
 - 5. Electric water cooler: 1-1/4" Type M copper tubing with cast brass drainage fittings.
- B. Connections shall be made to all equipment and fixtures furnished under other sections of these specifications.

2.13 PLUMBING FIXTURES

- A. Furnish and install all plumbing fixtures complete with all equipment, fittings, trimming, and accessories, as shown or specified. Unless otherwise indicated, Zurn fixtures and seats are used as a guide and the plate numbers are those given in their catalog. Fixtures as manufactured by Acorn, American Standard, Crane, Eljer, Elkay, Encore, Fiat, Just, Kindred, Kohler, Williams or Zurn will be acceptable.
- B. Waterless urinals shall be manufactured by Zero-Flush.
- C. Seats as manufactured by Bemis, Beneke, Centoco, Church, Olsonite, Sperzel or Zurn will be acceptable.
- D. Faucets as manufactured by American Standard, Chicago, Delta HDF, Encore, Moen, Sloan, Speakman, Symmons, T&S or Zurn are acceptable.

- E. Flush valves as manufactured by Zurn, Moen or Sloan will be acceptable.
- F. Fixture supplies and P-traps shall be as manufactured by Brasscraft, McGuire, EBC, Watts or Zurn/Sanitary-Dash.
- G. Insulation safety covers for lavatory and sink drains and water pipes shall be white PVC resin. The covers shall resist thermal transfer, be antimicrobial and ADA compliant.
- H. Carriers and Interceptor traps shall be as manufactured by J. R. Smith or approved equal by Josam, Mifab, Wade, Watts or Zurn.
- I. Electric water coolers shall be as manufactured by Elkay or approved equal by Halsey Taylor or Sunroc.
- J. Emergency shower/eye wash fixtures shall be as manufactured by Haws or approved equal by Acorn, Bradley, Econ, Guardian, Laboratory Enterprises or Speakman are acceptable.
- K. Where trap primers for floor drains are indicated on the drawings, omit the McGuire P-traps specified with the fixture and provide a trap primer P-trap as detailed on the drawings.
- L. Grout all water closets at floor and caulk all lavatories and urinals at walls. Seal all countertop sinks and lavatories with plumber's setting putty.
- M. Provide plumbing fixtures as described below:
 - P-1 Water closet: Zurn Z5650 vitreous china elongated 1.6 gpf siphon-jet action closet with bolt caps, Z6000-WS1 flush valve with YK solid ring wall brace, Z5955SS-ST5-EL white open front seat with self-sustaining check hinge and stainless steel hinge post.
 - P-1a Water closet (18" high Barrier Free): Zurn Z5660 18" high vitreous china elongated 1.6 gpf siphon-jet action closet with bolt caps, Z6000 -WS1 flush valve with YK solid ring wall brace, Z5955SS-ST5-EL white open front seat with self-sustaining check hinge and stainless steel hinge post.
 - P-1b Water Closet (Child's Barrier Free): Same as fixture P-1 except install water supply line at 20" a.f.f. to clear grab bar mounted above.
 - P-2 Lavatory: Zurn Z5344 20" x 18" vitreous china lavatory (4" centers), Z81000-G chrome single lever faucet less pop-up drain and holes with 0.5gpm aerator, Z8743 1-1/4" drain with grid strainer, McGuire 8872 1-1/4" 17 gauge chrome P-trap, two McGuire 170SS 3/8" O.D. chrome supplies with angle stops & stainless steel braided flexible risers. Provide J. R. Smith Fig. 0700 floor mounted carrier with concealed arms.
 - P-2a Lavatory (Barrier Free): Same as fixture P-2 except mount 29" to bottom to clear wheelchair. Provide insulation safety covers on drain and hot and cold water supplies.

- P-2b Lavatory (Student): Zurn Z5341 20" x 18" vitreous china lavatory, Z8743 1-1/4" drain with grid strainer, Z82701 single lever cold water faucet with anti-rotation washer, 0.5gpm aerator, McGuire 8872 1-1/4" 17 gauge chrome plated P-trap, McGuire 170SS 3/8" O.D. chrome plated supply with angle stop & stainless steel braided flexible riser. Provide J. R. Smith Fig. 0700 floor mounted carrier with concealed arms.
- P-2c Lavatory (Student Barrier Free): Same as fixture P-2b except mounted 29" to bottom to clear wheelchair. Provide Truebro 102 E-Z insulation safety covers on drain and cold water supply.
- P-2d Lavatory (Child Barrier Free): Same as fixture P-2b except mounted 24" to bottom to clear wheelchair. Provide insulation safety covers on drain and cold water supply.
- P-2e Wash Fountain (Barrier Free): Bradley Sentry Model SN2024 - 54" four station floor mounted semi-circular stainless steel wash fountain with type O offline vent with supplies from above, four type IR infrared activated control, standard pedestal height, TMA thermostatic mixing valve, LSD soap dispenser and stainless steel backsplash. Provide chrome plated 1 1/2" diameter p-trap and two supply valves with stainless steel flexible hoses.
- P-3 Urinal: Zero-Flush ZF-501 vitreous china waterfree urinal with sealed cartridge containing biodegradable sealant liquid. Urinals shall be purchased from Southeast Link, Larry Lott, 404-683-8965, for \$150.00 each. No freight is included. Provide J. R. Smith Fig. 635 floor mounted carrier with bearing studs.
- P-3a Urinal (Barrier Free): Same as P-3 except mounted 17" to rim.
- P-4 Mop Basin: Fiat TSB-3001 32" x 32" x 12" precast terazzo mop basin with 6" drop front, 3" strainer. Install Zurn Z843M1 service sink faucet with wall brace, bucket hook, vacuum breaker and stops in shanks 36" above floor.
- P-5 Electric Water Cooler: Elkay EWA14 wall mounted cooler with vandal resistant bubbler, stainless steel top, stainless steel cabinet, McGuire 170SS 3/8" O.D. supply with angle stop and stainless steel braided flexible risers, McGuire 8872 1-1/4" 17 gauge chrome P-Trap with clean out plug. Refrigeration system shall have a five year warranty. Cooler shall be certified lead-free. Mount at 40" to top of spout.
- P-5a Electric Water Cooler (Barrier Free): Elkay VCR85 vandal resistant wheelchair cooler with front push button vandal resistant bubble, stainless steel top, type 304 stainless steel cabinet, McGuire 170SS 3/8" O.D. supply with angle stop and stainless steel braided flexible risers, McGuire 8872 1-1/4" 17 gauge chrome P-trap with clean out plug. Refrigeration system shall have a five year warranty. Cooler shall be certified lead-free. Mount 36" to top of spout.

- P-6 Workroom Sink: Just SL-ADA-2125-A-GR 21"x25"x6-1/2" deep 18 gauge stainless steel self rimming sink with non-abrasive sound deadener, Chicago 201-AHA8 high spout swing faucet with 2.2 gpm aerator, Just J35FS flat strainer with 1-1/2" tailpiece, McGuire 8912 1-1/2" chrome plated 17 gauge P-trap, two McGuire 170SS 3/8" chrome supplies with angle stops and stainless steel braided flexible risers. Provide Truebro 102 E-Z insulation safety covers on drain and hot and cold water supplies on Handicap sinks.
- P-6a Classroom Sink: Just RA-ADA-1725-A-GR 6-1/2" deep 18 gauge stainless steel sink with non-abrasive sound deadener, Chicago 350 gooseneck faucet with 2.5 gpm aerator, Chicago 748 chrome Bubbler, Just J35FS Flat strainer with 1-1/2" tailpiece, McGuire 8912 1-1/2" P-trap, two McGuire 170SS 3/8" O.D. chrome supplies with angle stops and stainless steel braided flexible risers. Provide insulation safety covers on drain and cold water supplies on Handicap sinks.
- P-6b Not used.
- P-6c Kitchen Sink with Disposer: Just DL-ADA-2133-A-GR 21"x33"x6-1/2" 18 gauge double compartment stainless steel self-rimming sink with non-abrasive sound deadner, Chicago 200 faucet with 8" high swing spout, 2.5 gpm aerator hose with spray, Just J35316 crumb cup strainer in right hand compartment, In-Sink-Erator Evolution Compact 3/4 HP Food waste disposer mounted in right hand compartment, McGuire 111 1-1/2 chrome plated continuous waste, McGuire 8912 1-1/2" chrome plated 17 gauge P-trap, two McGuire 170SS 3/8" O. D. Chrome supplies with angle stops and stainless steel braided flexible risers. Provide insulation safety covers on drain and hot and cold water supplies on Handicap sinks.
- P-6d Hairwash Sink: Furnish under another section of the specifications. Provide rough-in and make final connections. Provide 1-1/2" tailpiece and p-trap and two 1/2" angle stops.
- P-6e Health Science Sink: Just SL-ADA-2125-A-GR 21"x25"x6-1/2" deep 18 gauge stainless steel self-rimming sink with non-abrasive sound deadener, Chicago 785-E-3 gooseneck faucet with 2.5 gpm aerator and with 4" wrist handles, Just J35FS flat strainer with 1-1/2" tailpiece, McGuire 8912 1-1/2" P-trap, two McGuire 170SS 3/8" O.D. chrome supplies with angle stops and stainless steel braided flexible risers. Provide insulation safety covers on drain and hot and cold water supplies on Handicap sinks.
- P-7 Not Used.
- P-8 Not Used.
- P-9 Vegetable Sink: Sink with faucet and lever handle waste is furnished under another section of the specifications. Provide two 1/2" valves in water lines and 2" waste line to floor drain.
- P-10 Pot Sink: Sink with faucets and lever handle waste is furnished under another section of the specifications. Provide four 1/2" valves in water lines and 2" waste lines to floor drains.

- P-11 Not Used.
- P-12 Dishwasher: Furnished under another section of the specifications. Provide water and waste connections as detailed on the drawings.
- P-13 Not Used.
- P-14 Hose Reel: Chicago 536 consisting of 537 retractable hose reel with 35' hose with bumper, spring, and push lock hose end spray, 893 backflow preventer, 770 shut off valves, 767-VOC concealed two valve fitting, 1771C loose key check valves, E7FC volume control with 777-27 coupling. See detail on drawings for installation.
- P-13 Not Used.
- P-16 Ice Maker Box: IPS Water-Tite 9000 recessed PVC box with 1/2" stop. Approved equal by Oatey.
- P-17 Washer Connection: IPS Water-Tite W2700HA recessed PVC supply and drain box with two 1/2" quarter turn valves, water hammer arresters and 2" drain. Approved equal by Oatey.
- P-18 Dishwasher (Residential): Furnish under another section of the specifications. Provide rough-in and make final connections.

2.14 ELECTRIC WATER HEATERS WH-1, 2 & 3

- A. Water heater shall be the energy saving automatic electric storage type water heater complete with glass lined tank, tank insulation, enameled finished exterior casing, electric heating elements, water temperature controls, and ASME rated temperature and pressure relief valve. The heater shall comply with ASHRAE 90A-80 for energy efficiency.
- B. Water heater shall have a 3 year warranty when used in a commercial building.
- C. Water heater shall be as manufactured by A.O. Smith or approved equal by Bradford-White, Lochinvar, Rheem, Ruud, or State.

2.15 PIPE MARKERS AND LABELS

- A. All piping installed in mechanical rooms or above accessible ceilings shall be labeled to indicate the system type. Labels shall be installed at 40 feet on center on cold water, hot water and gas piping.
- B. Labels shall be self sticking pipe markers with black letters. Labels shall be W. H. Brady style B-946 or approved equal by T & B Westline or Seton.
- C. Install 1/2" diameter red plastic markers on ceiling grid at each shutoff valve concealed above ceiling.

2.16 HOT WATER RECIRCULATING PUMP

- A. Hot water recirculating pump shall be an in-the-line, bronze booster pump with stainless steel impellor and aluminum oxide ceramic shaft and bearings. Direct drive motor shall have built-in thermal overload protection. Pump shall be of the size and capacity indicated on the drawings and shall be as manufactured by Grundfos or approved equal by Myers or Zoeller.

2.17 ELECTRICAL

- A. Power supply and control wiring to equipment furnished under this section will be furnished under the Electrical Section of the Specifications.

End of Section 15 100

SECTION 15300
SPRINKLER SYSTEM

PART 1 - GENERAL

1.1 CODES

- A. Work shall conform to NFPA 13, Sprinkler Systems, 2002 Edition, and NFPA 24, Outside Protection, 2002 Edition. NFPA 14, Standpipe Systems, 2000 Edition and International Fire Code, 2003 Edition.

1.2 SPRINKLER SYSTEM

- A. The existing building is fully sprinklered.
- B. Relocate existing sprinkler heads as required for proper coverage in renovated areas of the existing building.
- C. The occupancy classification of the building is light hazard except in specific areas where other classifications are required by NFPA 13. The sprinkler system shall be designed to deliver 0.10 gpm per square foot over an area of 1500 square feet in light hazard areas.
- D. The contractor shall determine the location of all sprinkler heads, arrange and size the sprinkler piping using hydraulic calculation.

1.3 SHOP DRAWINGS

- A. Submit the following information:
 - 1. Water flow test data.
 - 2. Hydraulic Calculations.
 - 3. Materials and equipment lists, manufacturer's data and cut sheets.
 - 4. Shop drawings, including dimensioned plans, sections, details, and elevations showing locations and arrangement of piping, sprinklers, valves, alarms and dampers.
 - 5. Certificate of tests.
- B. The arrangement of sprinkler piping exposed to view in finished areas shall be approved by the Architect.
- C. Shop drawings shall be submitted to and approved by the Georgia State Fire Marshal before any work is started.

1.4 HYDRAULIC CALCULATIONS

- A. The contractor shall perform a water flow test at the site in accordance with the procedure outlined in NFPA 13, Chapter 6.
- B. Hydraulic calculations indicating that the pipe sizes selected will deliver the required water flow density when the sprinkler system is connected to the existing water supply system shall be made by the contractor and submitted for approval.
- C. The calculations must be made using the HASS system or other approved computer program.

1.5 UTILITY CONNECTIONS

- A. Connect to the existing fire line as indicated on the drawings.

PART 2 - PRODUCTS

2.1 INSIDE PIPING

- A. Piping for the sprinkler systems shall be steel pipe manufactured in accordance with ASTM A 120, A135, A795 and A 53. Piping with minimum wall thickness outlined in NFPA 13-2-3 shall be used for pipe sizes greater than 2". Schedule 40 pipe may be used for smaller sizes.

2.2 FITTINGS (INSIDE PIPING)

- A. Pipe shall be joined with cast iron or malleable iron, screwed, flanged or welded steel fittings manufactured in accordance with NFPA 13-2-4 or U.L. listed fittings suitable for grooved pipe couplings. Plain end pipe fittings will not be accepted.
- B. Sprinkler drops may be installed using U.L. listed flexible stainless steel tubing.

2.3 HANGERS

- A. Suitable U.L. listed hangers shall be provided in accordance with NFPA-13-2-6.

2.4 VALVES

- A. OS & Y valves, gate valves, drain valves, post indicator valves and check valves shall be listed by U. L. for use in sprinkler systems.
- B. Provide a tamper switch on the post indicator valve for connection to the fire alarm system.

2.5 SPRINKLERS

- A. Sprinklers in areas having no suspended ceilings or having gypsum board ceilings fasten directly to the bar joist shall be standard upright, 1/2" or extended coverage 3/4" U.L. listed types having brass finish.
- B. Sprinklers in lay-in ceilings shall be standard small frame surface mounted pendant 1/2" or extended coverage 3/4", U.L. listed types having a chrome finish arranged for surface mounting.
- C. Sprinklers in suspended gypsum board ceiling shall be standard small frame 1/2" or extended coverage 3/4" U.L. listed concealed type with round cover.
- D. Sprinklers having an ordinary temperature rating shall be used except in mechanical equipment rooms and near duct outlets where sprinklers having an intermediate rating shall be used.
- E. Sprinklers shall be located in lay-in ceiling tiles in the center of the 24" X 48" tile or at quarter points in the tile, i.e. 12" from one end and 12" from each side. Sprinkler heads shall be arranged symmetrically in each space. Shop drawings shall indicate location of sprinkler heads in ceiling grid and shall show dimensions from sprinkler head to grid system.
- F. A stock of at least 6 spare sprinklers of each type used and a wrench shall be provided in a suitable accessible cabinet in the main valve room of each building.

2.6 ESCUTCHEON PLATES

- A. Escutcheon plates having a chrome finish shall be provided for all exposed wall and ceiling penetrations. Where sprinklers are within 12 inches of surface mounted lighting fixtures, 1 inch deep plates shall be used for standard surface mounted pendant sprinklers.

PART 3 - EXECUTION

3.1 SPRINKLER SYSTEM

- A. The sprinkler system shall be coordinated with and arranged to clear all ceiling grid, lighting fixtures, conduit ceiling diffusers, ductwork, piping and mechanical and electrical equipment as shown on the drawings.
- B. Sprinkler piping shall not be installed in service areas of air conditioning units. See mechanical drawings for details locating the service areas. Where conflicts occur, provide offsets in the sprinkler system piping.
- C. Sprinkler piping shall not be installed over the tops of electrical panels and switchboards in areas where piping is prohibited by the National Electrical code.
- D. Elevator shafts shall have sprinkler heads installed within 24" of the bottom of each shaft. The sprinkler heads shall be equipped with a shut-off valve located outside the hoistway. Elevator equipment rooms which have two hour rated walls and the top of elevator shafts shall have no sprinkler heads.
- E. A drawing framed under plastic showing the areas of the building served by each sprinkler zone shall be installed in the main valve room adjacent to the riser.

End of Section 15300

SECTION 15 400

HEATING, VENTILATING AND AIR CONDITIONING

PART 1 - GENERAL

1.1 CODES

- A. Work covered by this section of the specifications shall conform to NFPA 90A, Air Conditioning and Ventilating Systems, 2002 Edition and the Standard Mechanical Code, 2006 Edition with 2007 revisions.

1.2 SHOP DRAWINGS

- A. Where equipment is specified herein or on drawings, by manufacturer's names or numbers, this shall denote minimum requirements as to quality, type, capacity, function, and performance. All equipment must have the Engineer's approval before ordering. Submit not less than six (6) copies of submittal data on all equipment and materials.
- B. Submittals shall be bound in a binder with index tabs and shall include a cover sheet for each piece of equipment itemizing equipment features to show compliance with or deviation from the requirements contained in the specifications and drawings.

1.3 OPERATING INSTRUCTIONS

- A. The Contractor shall furnish not less than three(3) copies of operating and maintenance instructions for all equipment he has furnished and installed.
- B. All keys, operating manuals, maintenance instruction manuals and parts information shall be turned over to the Gwinnett County Board of Education Director of Construction and a signed receipt obtained.

1.4 INSPECTIONS

- A. The Contractor shall uncover all concealed areas during inspections.

1.5 SERVICE

- A. The Contractor shall furnish all labor and materials except filters required to properly service the systems throughout the guarantee period.
- B. The Gwinnett County Board of Education Maintenance Division shall be notified so that maintenance personnel can be present for any service inspection or repair.

1.6 GUARANTEE

- A. The Contractor shall provide guarantees as described herein in addition to those described in the General Conditions of these specifications for the following items:
- B. Refrigeration Compressors - 5 years
- C. Freight on all warranty parts shall be prepaid.

1.7 HVAC SYSTEM DESCRIPTION

- A. The HVAC system for rear classroom areas shall consist of individual water source heat pump units.
- B. The HVAC system for the front areas shall be existing multi-zone roof-top units.

PART 2 - PRODUCTS

2.1 WATER SOURCE HEAT PUMP UNITS

- A. Water source heat pump units shall be factory built package water to air reverse cycle units complete with compressor, coil, heat exchanger, supply fan, reversing valve and filter designed for horizontal installation above a ceiling.
- B. The units shall be rated in accordance with ARI/ISO standard 13256-1 and shall be UL listed. The units shall be a high efficiency type with an EER equal to or greater than 12.5. The units shall be capable of operating with an entering water temperature of 40°F and entering air temperature of 40°F at ARI water and air flow rates.
- C. The unit casing shall be constructed of galvanized steel. The cabinet shall be compartmentalized with the compressor, reversing valve and water coil out of the air stream. All interior surfaces shall be lined with fiber glass insulation. Service access shall be through insulated access panels on the bottom or sides of the unit which shall provide access to all components. The unit shall have hanger brackets which prevent the hanger rod from extending below the unit frame.
- D. Fans shall be DWDI forward curved, operating at 1200 rpm or less. Motors shall be multi-speed permanent split capacitor type with internal thermal overload protection. Fan scroll shall have one side removable for service. The fan wheel and motor shall be removable as an assembly without removing the fan scroll.
- E. Condensate drain pan shall be constructed of a corrosion resistant material and shall be insulated.
- F. Air coil shall be copper tube with corrugated aluminum fins.
- G. Water refrigerant heat exchanger shall be a tube in tube type with a working pressure of 625 psi. The outer wall shall be copper or steel and the inner wall shall be copper.
- H. Internal refrigerant piping shall be seamless copper tubing with all connections brazed. Schrader fittings shall be provided in liquid and suction lines.
- I. Reversing valve shall be a hermetic type with solenoid coil.

- J. Compressor shall be 1750 rpm scroll type with internal and external vibration isolator mounting and built-in motor overload protection. The compressor shall be bolted to the unit frame. Refrigerant shall be R410a.
- K. Filters shall be 1" metal frame filters installed in a field fabricated return air plenum. The unit shall be provided with a return air duct flange.
- L. Each unit shall be provided with limit controls to prevent operation when an unsafe condition exist. A refrigerant high pressure cutout shall deenergize the compressor if refrigerant pressure exceeds 395 psig. A low temperature thermostat with the sensing element directly in contact with the water or low pressure switch shall de-energize the compressor if the condenser water leaving the unit falls below 40°F.
- M. Units shall be capable of reset from the low voltage control circuit. Units shall not require that power supply be interrupted to reset.
- N. An overflow sensor in each unit shall prevent condensate overflow by stopping the compressor if condensate rises too high in the pan.
- O. The unit manufacturer shall furnish, factory install and wire a H.I. Solutions UUC4 subbase board in accordance with the attached wiring diagram HP-1 and drawings of UUC-4HP base board. Factory wiring shall include 24vac power (minimum 50va), fan, compressor, reversing valve, overcurrent protection sensor, condensate sensor, high pressure sensor, low pressure sensor and low temperature sensor. The fan, compressor and reversing valve are controlled by switching 24vac. The protection sensors are all normally closed contacts. The CPOK interlock relay, UUC4 controller board, optional smoke detector, humidity sensor, supply air sensor, LAN communication and thermostat are field furnished and installed by the controls contractor and are not included in this proposal. For factory and/or field testing, a manual test board is available from H.I. Solutions. This test board connects to the subbase board in the space provided for the UUC4 controller board and provides LED indications for each protection sensor and manual switches for controlling the fan, compressor and reversing valve.
- P. All controls shall be installed in a control panel which shall be flush mounted and parallel with the side access panel of the unit.
- Q. Provide a 24 volt output terminal to cycle a control valve with the compressor operation. The valve shall be field installed in the external piping.
- R. The units shall have a full parts warranty of one year and an extended compressor warranty for an additional four years. Warranty shall begin on the date of Substantial completion of the project where the units are installed.
- S. Units shall be installed above the ceiling in such a way that the amount of ceiling that must be removed for access shall be kept to an absolute minimum. Maintain a minimum of 24 inches clearance in front of access panels on all sides to service controls, compressors, and blower motors. Particular attention shall be given to location of condenser water mains and condensate drains in corridors.
- T. The Contractor shall completely install two units including electrical connection and the installation shall be inspected and approved by both the Engineer and a

representative of the Gwinnett County Board of Education before proceeding with the installation of the remaining units.

- U. Water source heat pump units shall be of the size, capacity and arrangement indicated on the drawings and as manufactured by Climate Master.
- V. Contractor shall purchase the units from the local Climate Master representative at the prices listed in the schedule on the drawings. The prices listed exclude tax and include freight to the job-site. The contractor shall include labor for any warranty work required during the one-year full warranty period.

2.2 DUCTLESS SPLIT SYSTEM AIR CONDITIONING UNITS - LOW TONNAGE

- A. Ductless split system air conditioning units shall be a combination of an air cooled condensing unit as scheduled on the drawings and a direct expansion fan-coil unit. The outdoor section shall be a factory assembled unit with direct drive fans, horizontal air discharge, scroll compressor, refrigerant coil, fan motor, prewired control panel and holding charge of R-410a refrigerant. The indoor fan coil unit shall include refrigerant coil, resistance heat coil, fan and motor, condensate pan with drain and prewired control panel. The indoor fan coil unit shall be wall mounted with a horizontal discharge as indicated on the drawings.
- B. Refrigerant coils shall be of non-ferrous construction with mechanically bonded, smooth plate fins. All tube joints shall be brazed. Coils shall be pressure tested at the factory.
- C. Condenser fans shall be direct driven, propeller type fans arranged for horizontal discharge. Condenser fan motors shall have inherent protection, shall be permanently lubricated and resiliently mounted. Each fan shall have a safety guard.
- D. Evaporator fan section shall have forward-curved blade, double inlet fans mounted on a solid shaft and run on permanently lubricated bearings. Fans shall be statically and dynamically balanced.
- E. Cabinets shall be made of galvanized steel, bonderized and finished with baked enamel. Compressor shall be serviceable hermetic type mounted to avoid vibration and equipped with high and low pressure switches and external service valves.
- F. The system shall be controlled by a microprocessor with diagnostic capability, located in the indoor unit. A wall-mounted, permanently wired control equipped with operation indicator lamps shall provide temperature control, airflow selection rate, heating/cooling mode selection on/off switch.
- G. Provide a PAC-715AD timer adaptor and 24 volt relay to allow the unit to be started and stopped by the building EMS.
- H. A built-in condensate pump shall be provided where indicated on the drawings.
- I. Return air shall be filtered using removable, washable filters.
- J. Provide accessory refrigerant line covers on line sets in finished areas not concealed in walls or chases.

- K. Refrigerant piping shall be installed in accordance with the manufacturers installation instruction. Both refrigerant lines must be insulated.
- L. Split system air conditioning units shall be of the size and capacity indicated on the drawings and as manufactured by Mitsubishi or approved equal by Carrier or Daikin.

2.3 IONIZATION SYSTEM

- A. Each Ionization device shall be capable of:
 - 1. Effectively controlling microorganisms throughout the building (mold, bacteria, etc.).
 - 2. Controlling ammonia to a level below 1.5 PPM.
 - 3. Maintaining a concentration of negative and positive ions at a level of 500-1500 negative ions per cubic centimeter in the primary space served by the device.
 - 4. Complying with U.L. 867 the maximum allowable ozone level shall not exceed the allowable ACGIH limit of 0.05 ppm as published in ASHRAE 62.1 2004, Appendix B.
- B. Submit the manufacturer's selected device for each size of air conditioning unit. Provide Indoor Air Quality calculations for each selection to confirm acceptable indoor conditions at scheduled air flows in accordance with ASHRAE Standard 62.1. The calculations shall be independently validated to verify accuracy of the IAQ calculations and conformance with Standard 62.1 by third party testing on a previous installation. Devices with set point adjustments shall be selected with the adjustment in the lowest setting.
- C. The ionization device shall be either ionization tube type or needlepoint type and shall be suitable for mounting in a duct. Electrical components shall consist of transformer, voltage regulation devices and isolation transformers required for proper operation of the device. The ionization device shall be installed downstream of a MERV 6 filter, minimum.
- D. Any ionization device with replaceable tubes shall be supplied with a 16 gauge galvanized or painted steel base that shall be permanently mounted to the duct to permit easy removal by machine screws and service of the ion generator without having to remove the sheet metal screws holding the plate to the duct. The base plate shall have gasketing between the base plate and the duct.
- E. Electrical power to the electrodes shall be interrupted by an air flow switch or integral electronic air flow sensing when the air flow is less than 100 fpm or when access doors to the electrode plenum section are opened. A differential air pressure switch shall be mounted and wired at the factory for duct mount ionization units. Ionization units mounted inside air conditioning units may require some field mounting of air pressure switch components.

- F. The unit shall be U.L. or ETL listed. Electrical wiring shall be in accordance with NFPA 70, NEC and when installed in a return air plenum shall be UL or ETL listed for installation in a return air plenum. Units shall operate on 24 volts and shall connect to the fan and common terminals of the unit served.
- G. A manufacturer's authorized representative shall provide start-up supervision and training of owner's personnel in the proper operation and maintenance of all equipment.
- H. Perform the manufacturer's recommended electrical and static pressure tests during start-up.
- I. At the completion of the project the manufacturer shall perform a system check by measuring the negative ion level in each primary space served by an ionization device and submit a report showing that the negative and positive ion level is within the specified limits. If any space fails to meet the criteria the manufacturer shall replace the ionization unit with one of the proper size.
- J. Provide to the owner a portable hand held ion counter with a range of 0 to 20,000 ions and an accuracy of +/- 25% within the specified range.
- K. At any time within three years after the date of substantial completion should an ionization tube fail to produce 75% of the ionization of a new tube the required negative or positive ion level, the manufacturer shall provide to the owner a replacement tube to be installed by the owner.
- L. A manufacturer's authorized representative shall provide start-up supervision and training of owner's personnel in the proper operation and maintenance of all equipment.
- M. When ionization devices using glass tubes are provided, manufacturer's authorized service representative shall provide service support to insure satisfactory air purification system operation. The service program shall include at minimum, two site visits, per year for the first three years of operation, inspection of the air purification system and air handling unit, monitoring and validation, including measurement of ion levels, inspection of protected areas and the submission of a written report to the owner and Engineer of record. Submit the Manufacturer's Service Program when requesting prior approval.
- N. The ionization devices shall be as manufactured by AtmosAire, Bioclimatic Air Systems, Global Plasma Solutions or Plasma Air.

2.4 ENERGY RECOVERY UNITS

- A. Energy recovery units shall be roof mounted units consisting of a weather-proof housing mounted on a full roof curb and containing supply and exhaust blowers, enthalpy wheel heat exchanger, cooling coil, compressor, hot gas reheat, filters and controls. The unit shall be completely factory assembled, pre-wired and thoroughly leak and safety control tested. After assembly, each unit shall be charged and run tested.
- B. Units shall be U.L. or E.T.L. listed. Performance shall be rated in accordance with ARI 340. Efficiency shall exceed ASHRAE 90.1.
- C. The housing shall be double wall construction of either steel or aluminum. Steel shall have G-90 galvanized coating. The outer housing shall be 18 gauge. Bases shall be 16 gauge. Inner liner shall be 22 gauge.
- D. Cabinet insulation shall be 1" thick closed cell foam insulation with an R value of 3.5 or 2" thick fiberglass insulation with an R value of 12.5 .
- E. The housing shall have access doors for access to fan motors and filters. Access doors shall be double wall construction and shall have full length stainless steel piano hinges and quarter turn cam operated latches. Doors shall have full perimeter gasketing and rain break overhangs.
- F. Fresh air inlet and exhaust outlet shall have rain hoods and bird screens outside and motor operated dampers inside the unit which shall open before the fans start. Supply and exhaust duct connections shall be inside the roof curb. The roof curb shall not be used as a plenum.
- G. In addition to the outside air damper and exhaust damper, the unit shall be provided with integral return air motorized damper to allow the unit to provide space humidity override during the unoccupied mode.
- H. Dampers will be low leak, airfoil design with extruded vinyl blade edge and jamb seals. The dampers will be rated for a maximum leakage rate of less than one percent of nominal airflow at 1 inch water gauge. Blades will rotate on bronze sleeve bearings. The actuators shall be direct drive.
- I. The design of the cabinet shall allow access to the compressor and electrical control panel without impairing unit operation.
- J. Unit base pan shall be constructed of stainless steel or aluminum with welded joints and seams and with water dams around all openings. Unit base pan may be G90 galvanized steel coated with viscous petroleum distillate to a uniform 1/4" wet depth, air dried, and cured to form a solid protective layer to eliminate corrosive oxidation.
- K. All exterior screws, nuts, bolts and washers shall be zinc or cadmium coated and shall withstand a minimum of 1,000 hours Salt Spray Test per ASTM B117 97.

- L. The housing which is constructed of G90 galvanized steel shall be chemically treated with zinc phosphate. All housings, either steel or aluminum shall be coated with 0.3 MIL polyurethane or alkyd primer, then finished with 0.8 MIL polyester or acrylic urethane top coat. Finish shall meet or exceeds 1,000 hour Salt Spray Test per ASTM B117 97. Final color shall be selected by the Architect.
- M. Roof curbs shall be full perimeter type constructed of 18 gauge galvanized steel. Curb shall be a minimum of 12" high, shall be internally insulated with 1.5" thick rigid fiberglass and shall have a wood nailer. The unit housing shall be designed to hang over the roof curb to provide an integral curb counter flashing and for positive positioning of the unit on the curb.
- N. Supply and exhaust blowers shall be backward inclined airfoil type or forward curved centrifugal type with adjustable V-belt drive for balancing the air flow. The complete blower and motor assembly shall be mounted on vibration isolators or have full curb isolation. The blower wheel shall be mounted on a solid steel shaft supported by ball bearings.
- O. Enthalpy wheel rotor shall be constructed of corrugated synthetic fiber-based media impregnated with a non-migrating water selective molecular sieve desiccant. The desiccant and heat exchanger matrix shall be a homogeneous media. Rotor frame shall consist of evenly spaced galvanized steel spokes, a galvanized steel band, and an aluminum center hub. Heat transfer effectiveness shall be as scheduled on the drawings. Manufacturers ratings shall be certified by ARI as complying with Standard 1060-2000. A motion sensor on the enthalpy wheel shall shut down the unit if the wheel fails to turn.
- P. Refrigerant cooling coils, condenser coils and hot gas reheat coils shall be aluminum fin, mechanically bonded to seamless copper tubing. Coils on units with two refrigerant circuits shall be face split.
- Q. Compressors shall be hermetic scroll type with crankcase heater. Units with compressor capacity larger than five tons shall have two compressors and two refrigerant circuits. Refrigerant circuit shall include accumulator, filter-dryer, sight-glass, dual gauge connections and thermal expansion valve. Safety controls shall include high pressure switch, low pressure switch and non-recycle timer. Head pressure shall be controlled by a variable frequency drive on the condenser fan. Hot gas by-pass control shall be provided to maintain minimum suction temperature.
- R. Compressors shall have a five year warranty.
- S. Hot gas reheat coil shall be controlled by an electronically controlled step motor type valve positioned by the control system to maintain a constant leaving air temperature. On two compressor units the reheat coil shall be connected to the lead compressor only when the lead compressor can provide sufficient reheat.
- T. Condensate pan shall be constructed of stainless steel and shall be sloped to drain as required by ASHRAE 62-1989.
- U. Filter racks shall be provided in both supply and exhaust air streams ahead of the coils and enthalpy wheel. Filters shall be 2" thick pleated type with an efficiency of 30%. Filters shall be sized for a maximum of 500 fpm face velocity.

- V. The energy recovery units shall be completely factory assembled and pre-wired with a single point electrical power connection. A main disconnect switch and motor starters with 3 overloads shall be factory mounted and wired in a weather-proof control panel. Each circuit shall be separately fused. Power wiring shall enter the unit from below inside the curb.
- W. Controls shall be factory installed and pre-wired. Temperature and humidity sensors, CO2 sensor, fan static differential pressure switches and control module shall be furnished by H.I. Solutions. The board provided by H.I. Solutions shall be the sole unit controller.
- X. All other controls including door interlock switches, damper actuators, motor starters and refrigeration controls shall be furnished by the unit manufacturer. A terminal strip shall be provided for connection of the EMS LAN and duct mounted smoke detectors.
- Y. An airflow / temperature measurement device shall be factory installed in the supply and exhaust air streams. The airflow device shall consist of one or more multi-point measuring probes and a single microprocessor-based transmitter with an LCD display. The air flow / temperature measuring device shall be an Ebtron model GTN116PC transmitter output for connection to the energy management system.
- Z. A wiring diagram for the EMS controls shall be furnished to the unit manufacturer by H.I. Solutions.
- AA. Energy recovery units shall be controlled as follows:
1. A control module shall be provided for each unit.
 2. Each ERU unit shall be programmed to start and stop according to the occupied/unoccupied schedule provided by the Owner. The units shall not run when the building is unoccupied.
 3. Supply and exhaust fans and the enthalpy wheel in the ERU shall run continuously when the ERU unit is running.
 4. A temperature sensor and humidity sensor located in the exhaust air intake shall provide temperature and humidity input signals to the control module.
 5. A CO2 sensor located in the exhaust air intake shall provide an indication of the average CO2 level in the space.
 6. When the temperature of the exhaust air is above 75°F or the relative humidity of the exhaust air is above 50% the unit compressor shall run in the cooling cycle.
 7. A temperature sensor located in the supply air shall control the hot gas reheat coil to maintain a minimum leaving air temperature of 70°F when the compressor is running.

8. A temperature sensor and a humidity sensor in the outside air stream on the leaving side of the enthalpy wheel shall provide temperature and humidity indication only.
 9. A temperature sensor in the outside air stream on the leaving air side of the cooling coil shall provide temperature indication only.
 10. The output of the airflow/temperature measurement device shall be readable through the EMS.
 11. Duct mounted smoke detectors, installed in the supply air duct of the ERU shall shut down the unit when smoke is present.
 12. When the unit is in the unoccupied mode, the outside air damper and exhaust air damper shall close and the return air damper shall open. Upon a signal that the space humidity exceeds set point, the unit shall energize the supply fan, DX cooling, and modulate the reheat coils as necessary to maintain the relative humidity set point.
- BB. The unit manufacturer shall provide factory start-up. The start-up report shall be included in the close-out documents. A copy of the start-up report shall be sent to the engineer as soon as the start-up is completed.
- CC. Energy recovery units shall be of the size and capacity scheduled on the drawings and shall be as manufactured by Addison, Berner, Innovent, Seasons Four or Venmar.

2.5 EXHAUST FANS - CEILING MOUNTED

- A. Ceiling mounted exhaust fans shall have centrifugal fan, shaded pole fan motor with built-in thermal overload protection, steel cabinet with fiberglass acoustical lining, backdraft damper and ceiling grille. Support fan from building structure using four 1/4" diameter threaded rods.
- B. Ceiling mounted exhaust fan shall be AMCA rated.
- C. Ceiling mounted exhaust fan shall be of the size, capacity and arrangement indicated on the drawings and as manufactured by PennBarry or approved equal by Acme, Breidert, Broan, Carnes, Cook, Greenheck, Jenn-Air or Twin City Fans.
- D. Prefabricated roof curbs as specified herein shall be provided for each roof cap as indicated on the drawings.

2.6 EXHAUST FANS - POWER ROOF VENTILATORS

- A. Power roof ventilators shall have spun aluminum housings, centrifugal fan wheel, direct drive motor with built-in thermal overload protection, pre-wired toggle type disconnect switch, bird screen, back-draft damper and prefabricated roof curb.
- B. Exhaust fans shall be AMCA rated for both air and sound.

- C. Exhaust fans shall be of the size, arrangement and capacity indicated on the drawings and as manufactured by PennBarry or approved equal by Acme, Breidert, Carnes, Cook, Greenheck, or Jenn-Air.
- D. Pre-fabricated roof curbs as specified herein shall be provided for each roof mounted fan.

2.7 WALL MOUNTED OSCILLATING PROPELLER FANS

- A. Wall mounted oscillating propeller fans shall have aluminum blades, totally closed, permanent split capacitor, two speed motor with built-in thermal overload protection, pull chain switch, oscillation mechanism, wire guard with polyvinyl coating, wall mounting bracket and power cord with plug.
- B. Wall mounted oscillating propeller fans shall be of the size and capacity scheduled on the drawings and as manufactured by Emerson or approved equal Cook or Con-Tech.

2.8 IN-LINE DRYER VENT FAN

- A. In-line dryer vent fan shall be a centrifugal direct drive fan constructed of galvanized steel and designed to mount in the dryer vent duct. Fan shall have totally enclosed split capacitor motor with sealed, self lubricating ball bearings and automatic reset thermal overload protection.
- B. An integral positive pressure switch and delay-on-make timer shall start the fan and cause it to run in ten minute intervals until the drying cycle is complete.
- C. Dryer vent fan shall be AMCA certified for air and sound performance and shall be U.L. listed.
- D. Dryer vent fan shall be of the size and capacity scheduled on the drawings and as manufactured by Fantech or approved equal by Ilg or Jenn-Air.

2.9 AIR DOOR FANS

- A. Air door fans shall have stainless steel cabinets with directional control vanes on fan outlet and perforated grille on the inlet, steel squirrel cage fans, permanently lubricated, ball-bearing motor with built-in thermal overload protection, and shall be U.L. listed. Fans shall mount on adjustable mounting brackets.
- B. Each fan shall be started by a magnetic reed switch mounted on the door jamb.
- C. Air door fans shall be of the size and capacity indicated on the drawings and as manufactured by Powered Aire Inc. or approved equal by Berner, Leading Edge or Mars.

2.10 RANGEHOOD

- A. Rangehood shall be a prefabricated system consisting of a wall mounted, single island or double island canopy, grease filters, exhaust and supply fans, ductwork, control panel, roof supports and fire extinguishing system.
- B. Canopy shall be of the dimensions shown on the drawings and constructed of 18 gauge type 301 stainless steel with liquid tight assembly at joints and seams. Exposed external welds shall be ground down, smoothed and polished. All concealed construction and surfaces shall be 18 gauge galvanized or aluminized steel.
- C. Canopy design shall be U. L. classified and shall be a double shell design consisting of an inner exhaust canopy and an outer supply canopy providing an air plenum between the two canopies on the top and front. The ends shall have a double thickness of 18 gauge steel. A short circuit opening shall be provided inside the canopy. A perforated metal plate shall be installed behind the supply collars to provide even distribution in the supply plenum. Make-up air slots shall be adjustable. Vapor proof lights with compact fluorescent lamps and guards shall be installed inside the canopy at approximately 3'-0" on center.
- D. Filters shall be U.L. labeled stainless steel self draining baffle type.
- E. Hood shall have been tested and rated by U. L. for 600°F+ cooking equipment with a minimum supply air ratio of 86%. The manufacturer shall provide a copy of the U.L. approval which list the hood by model number.
- F. Exhaust fan shall be upblast type power roof ventilator with spun aluminum housing with hinged base, aluminum fan wheel, V-belt drive and prelubricated motor mounted out of air stream, disconnect switch, and equipped with bird screen. Exhaust fan shall be of the size and capacity scheduled on the drawings and shall be U. L. labeled for grease contaminated air.
- G. Supply fan shall be forward curved centrifugal blower with adjustable V-belt drive, permanently lubricated motor, galvanized steel housing with baked enamel finish. Supply fan shall be supported by a roof curb and/or support legs.
- H. Backdraft damper in the supply fan shall be a motorized damper with steel frame, aluminum blades with felt seals. Damper shall be prewired and shall open when the supply fan starts and close when the fan stops.
- I. Make-up air filters shall be 1" thick aluminum mesh washable filters. The make-up air inlet shall be protected with a weatherhood and a birdscreen.
- J. Roof curb shall be a prefabricated galvanized steel curb with integral wood nailer, and 1" rigid fiberglass insulation. Roof curbs shall provide a level platform for fans when installed on a sloped roof. See drawings for the amount and direction of slope. Auxiliary support for the supply fan section shall be a prefabricated equipment support curb, Custom Curb model CES-1 or approved equal.

- K. Exhaust and supply fans shall be provided with magnetic motor starters. Starters and controls shall be factory mounted in a control panel and factory wired to a master power disconnect switch. Power wiring shall be complete to a single point of connection. Control wiring shall terminate on terminal strips.
- L. A heat sensor with an adjustable set point shall start the fans whenever the temperature under the hood rises indicating cooking equipment is turned on.
- M. Fans shall be controlled from switches furnished under the Electrical section. One switch shall start both the supply and exhaust fans. A second switch shall turn on the vapor-proof lights.
- N. Exhaust ducts shall be 16 gauge galvanized steel with all joints and seams welded. Exhaust and supply ducts shall be in a concentric arrangement and shall be U. L. labeled MH10644 so that exterior duct can be installed within 1" of combustible materials. Duct connections shall include U. L. approved slip joints for vertical duct and flanges for field welding on horizontal duct.
- O. A parallel duct arrangement is acceptable providing the contractor satisfied the clearance requirements of NFPA 96 as interpreted by the local Fire Marshal. The contractor shall provide sheet metal shop drawings of the supply and exhaust duct.
- P. The rangehood shall be equipped with an automatic, liquid chemical fire extinguishing system, Pyro Chem, Range Guard Karboloy II or Ansul R-102. The system shall be installed in accordance with the requirements of NFPA 17A and shall be UL listed. The system shall include one remote pull station and one energy shut-off valve in the gas main to the equipment located under the hood. The shut-off valve shall be a mechanically operated solenoid valve. Exposed piping for surface protection nozzles shall be stainless steel.
- Q. Auxiliary contacts shall be provided in the fire extinguishing system for connection to the building fire alarm system, to operate shunt trip circuit breakers serving electrically heated cooking equipment and to shut down the supply fan.
- R. The rangehood system shall be constructed in accordance with the requirements of NFPA 96, 1994 or later edition, NSF Bulletin No. 33 and shall be U.L. classified. The supply and exhaust air quantities shall be as required by NFPA 96 and U. L. for the specific hood furnished.
- S. The rangehood system shall be as manufactured by Duo-Aire or approved equal by Gaylord or Greenheck

2.11 RESIDENTIAL RANGEHOOD

- A. Rangehood shall be a residential type constructed of stainless steel and equipped with a centrifugal blower with a resiliently mounted motor, solid state speed control and light switch. Ducted hoods shall have two aluminum filters and built-in backdraft damper..
- B. Rangehood shall be of the size and capacity indicated on the drawings and as manufactured by Broan or approved equal by Jenn-Air or General Electric.

2.12 AIR DISTRIBUTION DEVICES

- A. Air distribution devices shall be of the size and type scheduled on the drawings and shall be as manufactured by Krueger or approved equal by Anemostat, Carnes, E. H. Price, Metal-Aire, Nailor, Titus or Tuttle & Bailey.

2.13 VOLUME DAMPERS

- A. Volume dampers shall be constructed with not less than 18 gauge galvanized steel blades or 0.080" thick extruded aluminum blades, galvanized, structural steel channel frame, permanently lubricated bearings, steel shafts and linkage. Dampers shall be linked for opposed blade operation. Manual volume dampers shall have locking quadrant operators. Motor operated volume dampers shall have extended shafts to connect operator.

2.14 FIRE DAMPERS

- A. Horizontal or vertical fire dampers with 165°F fusible link shall be installed where indicated on the drawings. Fire dampers shall be tested by Underwriters' Laboratories, Inc. in compliance with U.L. 555 and shall have a U.L. label.
- B. Fire dampers shall be installed in a galvanized steel sleeve with mounting angles, constructed of the same gauge metal as the duct to which it is to be attached or 16 gauge as required by the manufacturer's installation instructions. Installation shall be in accordance with U.L. 555 requirements and the manufacturers installation instructions.
- C. Fire dampers shall be 1-1/2 hour or 3 hour rated as indicated on the drawings. Dampers in rectangular ducts, twelve inches or more in height shall be constructed with blades located in the air stream. Dampers in rectangular ducts less than twelve inches in height shall be constructed with blades recessed out of the air stream. Dampers in round ducts shall be constructed with a rectangular housing containing blades out of the air stream and with round duct connection flanges.

2.15 SMOKE DAMPERS

- A. Smoke dampers shall be installed at the locations indicated on the drawings. Smoke dampers shall be classified by Underwriter's Laboratories, Inc. in compliance with U.L. 555S and shall have a U.L. label. Smoke dampers shall have a maximum leakage rate of 4 CFM per square foot at 1" W. G. pressure (Class I. and a temperature rating of 250°F).
- B. Smoke dampers shall have an electric operator factory installed. The damper shall be normally closed and shall open when the operator is energized. Voltage shall be as required by the temperature control manufacturer.

2.16 PRE-FABRICATED PIPE CURB ASSEMBLY

- A. Pre-fabricated pipe curb assemblies shall be Pate model PCA-2 with PCC-1 cover. Pipe curbs shall be 18 gauge galvanized steel, unitized, construction with straight sides, integral base plate, insulated with 3 pound density rigid fiberglass board insulation, 2 x 2 treated wood nailer, semi-rigid acrylic clad ABS plastic cover with four openings, fastening screws, and four graduated step EPDM boots with stainless steel band clamps.
- B. Pipe curbs shall be as manufactured by Pate or approved equal by Portals Plus or RPS. . Pipe Curbs shall be provided at the locations indicated on the drawings and shall have openings for gas or refrigerant pipes, power conduit and control conduit.

2.17 PRE-FABRICATED ROOF CURBS

- A. Pre-fabricated roof curbs shall be of box section design, 18 gauge galvanized steel with continuous welded and full mitered corner seams, treated wood nailer, insulated with 1-1/2" thick 3 pound density rigid fiberglass board insulation. Curbs shall be 11" high with straight sides. Cants shall be provided under Roofing Section of the Specifications. See Architectural Drawings for details. Curbs for roof hoods shall follow roof slope. Curbs for exhaust fans shall be shimmed to provide level platform.
- B. Curbs shall be Custom Curb CRC-3 or approved equal by Pate, Creative Metals, Curbs Plus, L&D, RPS or Shipman. Curbs shall be furnished for each piece of roof-mounted equipment and shall be of the proper size to fit the equipment furnished.

2.18 PRE-FABRICATED EQUIPMENT SUPPORT CURBS

- A. Pre-fabricated equipment support curbs shall be Custom Curb model CES-1. Supports shall be 18 gauge galvanized steel, monolithic construction with integral base plate, continuous welded and full mitered corner seams, treated 2 x 6 nailer, 18 gauge galvanized steel counter-flashing. Support shall have built-in raised cant starting a distance equal to the roof insulation above the roof deck and continuing to a minimum of 8" above the finished roof deck.
- B. Equipment support curbs shall be as manufactured by Custom Curb or approved equal by Pate, Curbs Plus or RPS. Supports shall be of the proper size to fit the equipment furnished.

2.19 LOW PRESSURE DUCTWORK

- A. All ductwork except that indicated to be of other types of construction shall be low pressure galvanized steel ductwork.
- B. Low pressure galvanized steel ductwork shall be installed as diagrammatically shown on the drawings and shall be constructed in accordance with the SMACNA HVAC Duct Construction Standards, 1985 Edition.

- C. Low pressure galvanized steel ductwork shall be constructed of galvanized sheet steel of lock forming quality and with a galvanized coating not less than 1-1/4 ounces per square foot total for both sides. Low pressure ductwork shall be 1" W. C. pressure class.
- D. Radius elbows shall be full radius type with a throat radius equal to the duct width as shown in Fig 2.2, Type RE1. Square elbows shall have double thickness turning vanes as shown in Fig. 2-3.
- E. Transitions shall be made with a slope not exceeding 1 in 4 where space permits.
- F. Transverse joints shall be sealed in accordance with Table 1.2, Duct Sealing Requirements, Class C. Sealants shall U.L. listed mastic or liquid.
- G. Round duct shall be connected to rectangular duct using spin-in fittings with scoop and damper or scoop only with no damper as indicated on the drawings. Provide quadrant standoff brackets on dampers in insulated duct.
- H. Access doors shall be installed in the ductwork at each fire damper and volume damper and elsewhere as indicated on the drawings. Access doors shall be internally insulated double wall type.

2.20 MEDIUM PRESSURE DUCTWORK

- A. Where indicated in the drawings ductwork shall be medium pressure ductwork.
- B. Medium pressure ductwork shall be installed as diagrammatically shown on the drawings and shall be manufactured and installed in accordance with the SMACNA HVAC Duct Construction Standards, 1995 Edition.
- C. Medium pressure round ductwork shall be spiral duct with flanged fittings and shall be manufactured of galvanized steel meeting ASTM A653. Round and flat oval medium pressure ductwork shall be 10" W. C. pressure class.
- D. Where liner is indicated on the drawings the liner shall be 1" fiberglass duct liner held in place with a perforated metal inner duct.
- E. All transverse joints and longitudinal seams shall be sealed in accordance with Table 1.2, Duct Sealing Requirements, Class C for 1" operating pressure. Sealants shall be U.L. listed mastic or liquid.
- F. Medium pressure spiral duct is used for appearance only. The surface of the duct shall be left clean and ready to receive paint.

2.21 FLEXIBLE DUCT

- A. Low and medium pressure flexible duct shall be constructed of a three ply inner liner of aluminum, fiberglass and polyester, or a single ply CPE liner bonded to a galvanized steel wire helix and insulated with fiberglass insulation with fire retardant fiber reinforced metalized vapor barrier.
- B. Flexible duct shall be U.L. listed as a class 1 air duct complying with U.L. standard 181 and shall have a working pressure of 10" minimum. Fiberglass insulation shall have an R of 5.0. The duct shall be tested for a maximum internal operating temperature of 250°F.
- C. Flexible duct shall be connected to rectangular duct using spin-in fittings with scoop and damper or scoop only with no damper as indicated on the drawings.
- D. To install, peel back insulation and outer jacket approximately 4" to expose duct. Slide duct over collar and apply clamp. Clamps shall be self-locking nylon type. Pull insulation back into position. Tape over end of jacket with 3 wraps to seal.
- E. Flexible duct shall be as manufactured by Flexmaster Type 3, Thermaflex MK-E or Atco UPC 37.

2.22 REFRIGERANT PIPING AND SPECIALTIES

- A. Refrigerant piping, except piping factory installed as part of equipment, shall be type "L" hard drawn copper tubing conforming to ASTM Specification B-88. Fittings shall be long radius type wrought copper solder fittings conforming to ASTM Specification B-75.
- B. Joints in refrigerant piping shall be made with silver solder or Silfos except that joints at valves may be made with 95-5 solder.
- C. Hangers shall be B-Line Fig. 3170 adjustable swivel ring hangers or approved equal by Grinnell, Michigan or PHD. Hangers shall be spaced at not greater than 6'0" intervals and shall be secured to the building structure with lag bolts.
- D. Vertical risers shall be supported with horizontal sections of B-Line, Unistrut or Michigan channel installed 4'0" on center. Clamps shall have rubber isolators.
- E. Pipe covering protection saddle shields shall be used in conjunction with all horizontal insulated lines. Shields shall be 16 gauge galvanized sheet metal.
- F. Each refrigerant circuit shall have a sight glass and filter dryer installed in the liquid line.
- G. Refrigerant piping shall be installed in strict accordance with equipment manufacturer's recommendations. If any changes from the refrigerant piping details on the drawings are required by the manufacturer, a piping diagram of each refrigeration piping system shall be prepared and submitted for approval. The piping diagram shall be first approved by the equipment manufacturer before submittal is made to the Architect.

- H. The refrigerant piping system shall be pressure tested at 350 psig and checked for leaks with a leak detector. The system shall then be purged and evacuated to 250 microns. The vacuum shall be broken with dry nitrogen and then purged and evacuated to 100 microns. The system shall then be charged according to the unit manufacturer's recommendations.

2.23 CONDENSATE DRAIN PIPING

- A. Condensate drain piping shall be type "L" hard drawn copper tubing conforming to ASTM Specification B-88. Fittings shall be long radius type wrought copper solder fittings conforming to ASTM Specification B-75.
- B. Drain piping shall be pitched not less than 1/4 inch per foot in the direction of the flow except that where height will not permit this amount of slope, the slope may be reduced to 1/8 inch per foot.
- C. Joints in copper pipe shall be made with 95-5 tin-antimony solder.
- D. Hangers shall be B-Line Fig. 3170 adjustable swivel ring hangers or approved equal by Grinnell, Michigan or PHD. Hangers shall be spaced at not greater than 6'0" intervals and shall be secured to the building structure with beam clamps.
- E. Pipe covering protection saddle shields shall be used in conjunction with all horizontal insulated lines. Shields shall be 16 gauge galvanized sheet metal.

2.24 WATER PIPING

- A. Circulating water, cooling tower water and hot water piping 2-1/2" and larger shall be schedule 10 and 2" and smaller shall be schedule 5 black steel conforming to ASTM Specifications A-135.
- B. Piping 2" and smaller may in lieu of steel piping be type "L" hard drawn copper tubing conforming to ASTM specification B-88.
- C. Drain piping installed outside the building shall be schedule 40 galvanized steel piping conforming to ASTM A-53 with threaded joints and galvanized fittings.
- D. Water piping mains shall be installed dead level. The run-outs shall be graded in a manner to prevent air traps being formed when the mains expand or contract. Air vents shall be installed at the ends of mains and at all high points in the systems.
- E. Copper pipe fittings shall be wrought copper solder fittings conforming to ASTM Specification B-75.
- F. Joints in copper piping shall be made with silver solder or Silfos except that joints at valves may be made with 95-5 solder.
- G. Steel pipe fittings shall be Victaulic mechanical fittings or approved equal fittings by Gruv-Lock or Grinnell on schedule 10 black steel pipe 2-1/2" and larger and Victaulic "Pressfit" fittings on schedule 5 black steel pipe 2" and smaller. The mechanical couplings and fittings shall be installed in accordance with the manufacturer's published instructions.

- H. In lieu of soldered fittings in copper pipe the contractor may substitute Victaulic, Grinnell or Gruvlok grooved mechanical couplings, Rigid Pro Press system or T-Drill mechanically formed fittings with brazed connections. Each of these systems shall be used in accordance with the manufacturer's published instructions.
- I. Welded type joints shall not be used.
- J. Unions in steel or copper lines 2" and smaller shall be threaded type. Unions in steel lines 2-1/2" and larger shall be bolted flanges.
- K. Steel or copper piping shall be supported at intervals not to exceed 6'-0" for sizes 1-1/2" and smaller and at intervals not to exceed 10'-0" for sizes 2" or larger, and at each change in horizontal or vertical direction. Hangers shall be B-Line Fig. 3100 standard clevis hanger or approved equal by Grinnell, Michigan or PHD.
- L. Hangers shall be supported from building structure by means of beam clamps. Hanger rods shall be standard bolt steel with machine screw threads.
- M. Hangers on insulated piping shall be increased in size to fit over the insulation. Pipe covering protection saddle shields shall be used on all horizontal lines. Shields shall be 16 gauge galvanized sheet metal 12" long.
- N. Sleeves or core drilled holes shall be provided where piping passes through a concrete or masonry floor or wall which is in place before the piping is installed. Sleeves shall be steel pipe sections.
- O. Water piping systems shall be cleaned and degreased. The owner shall be notified before water is introduced into either the loop system or the cooling tower system. The owner wants to install chemical treatment to the cooling tower before water is put in the tower. The procedure for cleaning the systems shall be as follows:
 - 1. Prior to filling system, a temporary bypass shall be installed at each water source heat pump unit to connect the supply pipe directly to the return pipe using the flexible hose assemblies. Water shall not pass through unit strainers and flow control valves during cleaning.
 - 2. Fill the systems with clean water and remove all air.
 - 3. Start the pumps and circulate the water, checking and cleaning all strainers at pumps frequently.
 - 4. Continuously flush the systems adding make-up water to replace what is flushed out.
 - 5. Continue this procedure until the water is clean.
 - 6. Add a cleansing agent consisting of a solution of 1 lb. per 50 gallons of TSP (Tri-Sodium Phosphate. Circulate this solution for 24 hours.
 - 7. Drain the cleansing agent solution and refill the system with clean water.
 - 8. Remove the start-up strainer mesh in all pumps and remove all strainer meshes in the cooling tower pump.
 - 9. Remove bypass at heat pump units.
- P. Notify the Architect when the cleaning procedure is to be started. The Engineer's representative shall be present when the systems are drained (Step 7 above). If the Engineer's representative deems it necessary, the cleaning procedure shall be repeated.

2.25 VALVES

- A. The valves shall be suitable for the service for which they are installed and shall be fitted with the proper packing, lubricants, etc. All gate valves shall have back seats for repacking under pressure.
- B. Ball valves for steel lines (1/2" to 2") shall be Milwaukee BA100 bronze body, two piece valve with threaded ends, rated at 600 psi WOG or approved equal by Apollo, Crane, Hammond, Kitz, Nibco or Stockham.
- C. Gate valves for steel lines (1/2" to 2") shall be Milwaukee 105 bronze valve with non-rising stem, threaded ends, rated at 200 psi WOG or approved equal by Crane, Hammond, Kitz, Nibco or Stockham.
- D. Butterfly valves (2-1/2" and larger) shall be Milwaukee Series M ductile iron lug type valve with EPDM liner, eight threaded lugs so that valve can remain bolted to one flange while the other flange is removed and with lever lock handle operator with 10 degree notches and position lock, or approved equal by Centerline, Kitz, Mueller or Nibco.
- E. Hose end drain valves shall be bronze ball valve with hose end, Milwaukee BA100H or approved equal by Apollo, Crane, Hammond, Kitz, Nibco or Stockham.
- F. Where mechanical joint pipe couplings and fittings are used in lieu of welded or screwed pipe joints, ball valves, gate valves and butterfly valves as manufactured by Victaulic, Gruv-Lock or Grinnell are acceptable.

2.26 FLOW CONTROL AND BALANCING VALVES

- A. Flow control valves shall be installed at each water source heat pump unit as indicated on the drawings to maintain the scheduled GPM within 5% with differential pressure across the valve of 2 to 32 PSI. For 1/2" to 2" valves with stainless steel or brass flow cartridges, the flow cartridge shall be removable from the Y-body housing without the use of tools. Furnish a metal tag at each valve indicating the rated flow in GPM and the differential pressure.
- B. Units shall be connected to the condenser water piping using two 36" flexible long rubber hoses with steel braid covers, flared metal ends and a union. Provide a coupling to connect supply and return hoses to bypass unit during initial cleaning of piping system.
- C. Valve assemblies in the return line shall be a combination assembly consisting of a ball valve, a flow control valve and pressure and temperature ports with a flexible hose as indicated on the drawings. The valve assembly shall be a Flow Design Inc. Autoflow type AC or approved equal by B&G, Griswold or Nexus.
- D. Valve assemblies in the supply line shall be a combination assembly consisting of a ball valve, a strainer with a hose end drain valve with cap and chain and pressure and temperature ports with a flexible hose as indicated on the drawings. The valve assembly shall be a Flow Design Inc. type YC or approved equal by B&G, Griswold or Nexus.

- E. Water control valves in the return line shall be brass body two-way valves with 24 volt operators and shall be equipped with a normally open end switch. The maximum opening time shall be 65 seconds. The maximum pressure drop through the valve shall be 2 psi. control valves shall be manufactured by Belimo, Honeywell or Taco.
- F. Balancing valves shall be cast iron with bronze disc valve equipped with readout valves for connecting a differential pressure meter. The balancing valve shall have an indexing pointer and a calibrated nameplate to indicate the correct setting. Balancing valves shall be Bell&Gossett Type CB or Accu-flo, Armstrong Type CBV, Taco type CS, Wheatley type BV, Preso Type B+ or Flow Design type AS circuit setter valves.

2.27 WATER SPECIALTIES

- A. Automatic air vents at the ends of the mains and at high points in the systems shall be Bell&Gossett No. 87 or approved equal by Armstrong, Hoffman or Taco.

2.28 INSULATION

- A. All insulation shall have composite maximum flame spread rating of 25 and maximum smoke developed index of 50 as required by NFPA 90A. Duct liner shall comply with U.L. 181 Erosion Test. Accessories, such as adhesives, mastics, cements, or tapes shall have the same component ratings as listed above.
- B. Air conditioning supply and return ducts constructed of galvanized steel shall be insulated with 1-1/2 inch thick 0.75 PCF density fiberglass blanket insulation with an "R" of 5.2 and with foil-scrim-kraft vapor barrier. Insulation shall be secured to the duct with 17 gauge galvanized steel wire, spiral wrapped around the duct at 12" on center. Where ducts exceed 24" in width, install stick pins and speed clips on the bottom of the duct at 12" on center. All joints and seams shall be sealed with 3" wide foil-scrim-kraft tape.
- C. Air conditioning or heating supply and return ducts exposed in a conditioned space shall not be insulated.
- D. Where indicated on the drawings, supply and return air ducts shall be lined with 1" thick 2.0 PCF density fiberglass duct liner with a "R" of 3.7. Duct liner shall be secured to the duct with adhesive and additionally secured with stick pins and speed clips on a maximum of 15 inch centers. Duct sizes shown on the drawings are clear inside dimensions after liner is installed.
- E. On ducts and plenums where liner is installed, omit the layer of external insulation.

2.29 LABELING

- A. Each piece of mechanical equipment installed outside or on the roof or in mechanical rooms shall be labeled to indicate the unit number as indicated in the equipment schedules on the drawings. Labels shall be exposed to view. Labels shall be constructed using 2" high black film, adhesive backed, prespaced letters, W. H. Brady B-933 or approved equal by T&B Westline or Seton.
- B. Each piece of mechanical equipment mounted above lay-in ceilings shall be labeled to indicate the room number of the primary room served by the unit. Labeling shall be done in a legible manner using a black indelible marker.
- C. All piping shall be labeled to indicate the system type. Labels shall be installed at 40 feet on center on circulating water, cooling tower water and hot water supply and return piping. Labels shall be self sticking pipe markers with black letters and arrows to indicate the direction of flow. Labels shall be W. H. Brady style B-946 or approved equal by T & B Westline or Seton.

2.30 AIR FILTERS

- A. The Owner (Gwinnett County Public Schools) will provide initial filter installation along with filter changes as necessary during the Construction Phase, at the point of Test and Balance, and at Final Inspection. The filter maintenance on all school system projects shall be performed by a company selected by the Owner through competitive pricing agreements. Verify with the Facility Planning Department for the company currently under agreement with the Owner for these services.
- B. The General Contractor shall be responsible for contacting the Owner's vendor and coordinating filter installation with HVAC equipment installation. No HVAC equipment shall be operating without the Owner's filters installed.
- C. The General Contractor will not be responsible for any payments to the filter vendor for his services, only for coordination of the services.

2.31 MOTOR STARTERS

- A. Furnish individual automatic motor starters for all three phase or single phase motors as scheduled on the drawings. Motor starters located in the motor control centers are furnished under the Electrical section of the specifications.
- B. Motor starters shall be General Electric type CR306 with NEMA-1 enclosures, three electronic overloads with built-in phase protection in three phase starters, and with auxiliary contacts, push button or hand off auto switches and pilot lights as required by the control specifications.
- C. Single phase fractional horsepower motors shall have internal thermal overload protection except where motor starters are scheduled.

- D. Motor starters shall be General Electric as specified above or approved equal by Allen-Bradley, Cutler Hammer, Furnas, Siemens-Allis, Square-D or Westinghouse.
- E. Install Bakelite plastic labels, black with 1/4" high white letters, on the cover of each motor starter to identify the motor served by that starter.

2.32 ELECTRICAL

- A. Motors, motor starters, controls, relays, contactors and switches required for proper operation of equipment covered under this section, except items specified furnished under the Electrical Section or Direct Digital Temperature Control System Section shall be furnished under this section of the specifications. Devices which are a part of the power wiring circuit and which are not integral parts of the equipment, shall be installed under the Electrical Section.
- B. All control and interlock wiring shall be furnished and installed under Section 15500, Direct Digital Temperature Control System.

PART 3 - EXECUTION

3.1 TESTING AND BALANCING

- A. The Owner, The Gwinnett County Board of Education shall obtain the services of an independent test and balance agency that specializes in and whose business is limited to the testing and balancing of air conditioning systems.
- B. The Contractor shall cooperate with the test and balance agency and shall provide the following:
 - 1. Notify the Architect when the system is completely installed and ready for testing and balancing.
 - 2. Provide shop drawings of all equipment furnished.
 - 3. Start all equipment and provide all labor required to keep it in good working order during the test and balance procedure. Provide clean filters in each unit at the start of the procedure.
 - 4. Make all adjustments necessary to the equipment including changing belts and pulleys or motor speed taps on fan systems so that the equipment can be balanced to deliver the air quantities specified on the drawings.

End of Section 15 400

SECTION 15500

DIRECT DIGITAL TEMPERATURE CONTROL SYSTEM

PART 1 - GENERAL

1.1 CODES

- A. Work covered by this section of the specifications shall conform to NFPA 90A, Air Conditioning and Ventilating Systems, 2002 Edition and the Standard Mechanical Code, 2006 Edition with 2007 revisions.

1.2 SHOP DRAWINGS

- A. Where equipment is specified herein or on drawings, by manufacturer's names or numbers, this shall denote minimum requirements as to quality, type, capacity, function, and performance. All equipment must have the Engineer's approval before ordering. Submit not less than six (6) copies of submittal data on all equipment and materials bound in a binder with index tabs.
- B. Shop drawings for each system shall include but not be limited to wiring diagrams for power supply through starters, motor starter and interlock wiring, normal position of valves, dampers and relays. Also provide a detailed description of the sequence of operation, and/or complete software flow diagrams, with all data sheets for manufacturer's and outside purchased components. These data sheets are to be complete with maintenance service and calibration instructions.

1.3 OPERATING INSTRUCTIONS

- A. The Contractor shall furnish not less than three (3) copies of operating and maintenance instructions for all equipment he has furnished and installed.
- B. All keys, operating manuals, maintenance instruction manuals and parts information shall be turned over to the Gwinnett County Board of Education Director of Construction and a signed receipt obtained.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. The Direct Digital Temperature Control System (DDC) shall be an integrated, fully operational temperature control system and building management system as herein specified. Gwinnett County Public Schools (Owner) currently has certain system equipment installed at its central office and at each school facility. Equipment provided under this Specification shall be compatible with such equipment and shall be completely integrated with the existing hardware and software. The Contractor shall have full responsibility for all work necessary to satisfy the requirements of this Specification, including hardware and software integration.

- B. The DDC System shall be a computer-based direct digital control system consisting of a central control unit (CCU) located at Owner's central maintenance center, multiple remote site units (RSU), and multiple remote device controllers (RDC) and unitary device controllers (UDC). Equipment shall be installed in the school as required to provide temperature control and the control and monitoring of all points contained in the Input/Output Summary. The CCU (existing) and RSUs, RDCs, and UDCs shall make up a distributed processing control system with all hardware and software being provided by the Contractor. All hardware and software provided shall be fully integrated and compatible with the Owner's existing system.

2.2 WORK REQUIRED

- A. The equipment and services to be provided under this Specification shall include the following:
1. Direct digital temperature control of all heating, ventilating and air conditioning equipment using unitary controllers.
 2. Control and monitoring of all other equipment as shown on the Input/Output Summary.
 3. Electrical demand control using utility demand meter data to limit demand to user-specified limits.
 4. Energy optimization using time schedule, optimal start-stop, temperature setback, duty cycle control, and DDC.
 5. Management information reporting including utility demand and consumption metering, trend logs, operational data, preventative maintenance reports, and alarm reports.
 6. Automatic two-way communication between the school and the existing central office computer system to provide real-time, remote operator access, automatic transfer of all logs and reports to the existing central MIS system, and remote alarm reporting.
 7. Preparation of project drawings, wiring diagrams, and database generation as required.
 8. Provide and integrate into the Owner's existing CCU system, new colorgraphic floor plans, system drawings, and status screens with dynamic display of equipment status.
 9. Check out and start up of the system including verification using printouts that all systems are operational in all modes and integrated with existing system.

2.3 SYSTEM CONFIGURATION

- A. The system configuration shall include the following subsystems made up of certain existing equipment and software and new equipment and software to be provided under this Specification.
- B. Central Control Unit (Existing)
1. The Owner currently has in operation a CCU containing a computer with sufficient memory, operator terminal, printer, automatic dialing unit, and software for all specified capabilities. The CCU is capable of communication with a minimum of one hundred (100) RSUs by means of Owner's Intra-network and two-way dial-up telephone circuits using 9600 baud Hayes-compatible modems.
 2. The existing CCU is the HI Solutions Field Commander Building Management System including the PC Central Management Information System with colorgraphic generation and dynamic status display, automatic data collection and analysis, global communications, and run-time based PM system.
 3. The existing CCU is a distributed control system with server access over the Owner's Intra-network.
- C. Remote Site Unit
1. The RSU shall be a computer-based unit capable of operating as a stand-alone system for single building control and as an intelligent remote site controller in a distributed processing system. The RSU shall be fully compatible with the Owner's existing CCU hardware and software and shall perform energy control functions such as demand control, equipment scheduling, duty cycling, reporting, analog and digital monitoring, optimization, and direct digital control. The system shall provide temperature control of heating, ventilating, and air interface controllers, two way communications by Owner's Intra-network and dial-up telephone lines, modem and Local Area Network (LAN) interfaces for communications between multiple remote site units, remote device controllers, and unitary device controllers.
 2. The RSUs installed in Owner's existing schools are the HI Solutions Field Commander Building Management System.
 3. Multiple RSUs shall be capable of networking together to provide control for a single site.
- D. Remote Device Controller
1. The RDC shall communicate with the RSU by serial data using a single wire pair, up to 5,000 feet in length. The RDC shall provide addressable field panels with input and output interfaces to facility devices and sensors. The RDC shall be fully compatible with the RSU and, when using in conjunction with the CCU and RSU, shall function as a complete system. The RDC

shall contain power supplies, processing circuits, relays, switches, displays, and wiring terminals as required.

E. Unitary Device Controller

1. Unitary Device Controllers (UDC) shall be provided as required to control all equipment as specified on the Input/Output Summary. The UDC shall communicate with the RSU through its RS-485 LAN at 9600 baud via a 2-wire network. The UDC shall be a complete control subsystem with microprocessor, memory, control programs, and user-defined application programs. All UDCs shall be identical in hardware and software with the exception of user-defined databases. All UDCs shall have battery-backed clock/calendars and provide on-board trend logging and advisory message recording.

F. Air Conditioning Unit Control

1. Air Conditioning Unit Control shall be provided using Unitary Device Controllers. The Unitary Device Controller (UDC) shall be a complete control subsystem including 12-MHz microprocessor, power supply, battery backed RAM memory, input/output interfaces, LAN interface, and firmware.
2. The LAN interface shall be an industry standard RS-485 network communicating at 9600 baud on a single pair line to the RSU. Up to 120 UDCs shall be able to operate on the same pair with the RSU. Each controller shall be functional as an independent control system or as an integrated subsystem of the RSU when connected to the RSU LAN.
3. The UDC shall provide plug-in support for two remote thermostats to allow independent temperature control of two zones. A compatible thermostat shall be provided with space temperature sensor, timed override switch, override indication LED, and software-controlled local temperature adjustment.
4. Unitary controllers shall be provided as indicated on the project drawings. All UDCs supplied under this Specification shall be identical in hardware and software with the exception of user-defined facility database so that only one type of spare board is required. Systems that use dedicated design or firmware for a particular unitary function are not acceptable. There shall be no jumpers, configuration switches or calibration pots on the controller.
5. The unitary controller shall operate either from 24 VAC using a separate control transformer or power from the controlled equipment or from 24 VDC external power source. The power input shall be protected from power transients.
6. The unitary controller shall be track mounted in a standard 3.25 inch PVC track. All wire connections shall be made using plug-in screw terminal blocks which allow the board to be exchanged without disconnecting any wires. Optional thermostats shall be located up to 50 feet from the controller using quick disconnect cables.

7. The unitary controller shall provide the following control capacity:
 - a. Digital Outputs - USC's shall provide eight digital outputs with either opto-isolated triac drivers or relays. Each digital output shall have a corresponding LED to indicate its status.
 - b. Digital Inputs - The UDC shall provide 12 opto-isolated digital input devices with status LEDs. One of the digital inputs shall also be associated with a counter register.
 - c. Analog/Universal Inputs - UDCs shall have eight analog/universal inputs. As analog inputs they shall have a full 10-bit analog-to-digital resolution. UDCs with 8-bit resolution are not acceptable. As digital inputs, they shall provide binary status.
 - d. Analog Outputs - Three channels of analog outputs with a full 10-bit digital-to-analog conversion shall be provided. Analog outputs shall be 4-20 MA or 0-10 VDC. The controller shall provide 15 VDC output for use with externally powered transmitters. UDCs with 8-bit resolution are not acceptable.
8. DDC setpoint control shall be provided for the analog outputs. Each setpoint shall have full PID control and function in either a fixed base or floating mode.
9. UDCs shall be programmed from the Owner's existing CCU via Intra-network or dial-up phone lines and a portable computer which may be attached to the UDC LAN at the controller, thermostat, RSU or any point on the LAN. The computer shall also monitor activity, directly command any UDC, change parameters, or upload/download database parameters.

2.4 SENSORS AND CONTROLS

- A. All analog sensors, control relays, and status sensors shall be provided to properly interface the RDCs and UDCs with the building equipment as specified in the Input/Output Summary. The sensors and controls shall be new equipment installed in accordance with the manufacturer's recommendations.
- B. Temperature Sensors
 1. Temperature sensors shall be Platinum Resistance Temperature Detectors (RTD) or Thermistors with a temperature range of -30°F to 275°F. Sensors shall be wirewound platinum with a nominal resistance of 100 ohms at 32°F or 10K thermistors with a nominal resistance of 10,000 ohms at 77°F. Interchangeability tolerance at 70°F shall not exceed 0.70°F. Wiring from RTD sensors to RDCs shall be 3-wire or 4-wire configuration to minimize leadwire resistance effects. All temperature sensors shall be products of the same manufacturer.

2. The sensors shall be housed in enclosures appropriate for the application. As a minimum, four types shall be available:
 - a. Molded plastic unit suitable for wall mounting to sense room space temperatures,
 - b. Metal thermowell unit suitable for mounting in pipes to sense chilled and hot water temperatures,
 - c. Metal duct mounted unit suitable for mounting in air ducts, and
 - d. Metal outside air unit with sunshield and housing suitable for mounting outdoors.
3. Sensors with insertion-type housings shall provide 3, 6, 12 or 18 inch insertion depths as required for best temperature sensing.

C. Control Relays

1. Control relays shall be 24VAC coil-operated devices with contacts rated for the voltage and current requirements of the equipment to be controlled. Relays shall be plug-in type with sockets having screw terminals of 10 amps or less and non-plug-in type for control circuits exceeding 10 amps. Contact configuration shall be as required to properly interface with controlled equipment. All relays shall be U.L. listed.

D. Status Sensors

1. Status sensors shall be provided for all equipment controlled by the RDCs. Dry contact status inputs shall provide binary state information from the following types of equipment:
 - a. Air flow status for air handlers, fans, and blowers shall be sensed by differential pressure switches.
 - b. Liquid flow status of chillers, boilers, and pumps sensed by differential pressure switches rated for medium and pressure.
 - c. Equipment status of chillers, boilers, lights, heaters, alarm annunciators sensed by auxiliary relay contacts, and
 - d. Temperature condition of coolers and freezers sensed by setpoint thermostats where analog temperatures are not specified.

E. Humidity Sensors

1. Humidity sensors shall be sulfonated polystyrene, ionexchange humidity sensitive AC resistance grid type with internal temperature compensation. The sensor shall measure the range 0 to 100% RH with an accuracy of $\pm 3\%$ RH between 15 and 95% RH. The sensor housing shall be stainless steel with mounting brackets as required to protect the sensor and provide proper orientation to the air flow.

2.5 GENERAL REQUIREMENTS

A. Contractor Qualification

1. All equipment, parts, supplies, and material purchases must be made from: HI SOLUTIONS, 4040 Royal Drive, Kennesaw, GA 30144, Attn: Harold Ivester, phone: (770) 423-1150.
2. All installation and field service work must be made through Frazier Service Company who is the authorized agent for HI Solutions.

B. Nameplates

1. Each major item of equipment shall have the manufacturer's name, model number, and serial number permanently attached to the unit.

C. Compliance

1. Modems shall be FCC approved for direct connection to the dial-up telephone network. The certification number shall be permanently displayed on the modem housing. Other equipment shall be Underwriter's Laboratories approved.

D. Software

1. The contractor shall provide all software programs required to provide a completely operational system as described in this Specification. Distribution copies of all software shall be provided on floppy disks or CDs for loading into the CCU hard disk. Duplicate copies of all disks shall be provided.
2. The software shall be provided for use by the Owner on the system hardware under license covering the period that the DDC system is installed in the Owner's facility. During the one year warranty period, standard software updates shall be provided without charge.

E. Training

1. The Contractor shall provide, at no additional charge, a minimum of 8 hours of on-site instruction to familiarize Owner personnel with the capabilities, operation, and routine maintenance of the DDC system. The instruction shall include equipment functional descriptions, installation procedures, system start-up, system operation, and general system troubleshooting. All instruction shall be provided by factory-trained personnel.
2. The Contractor shall provide a tuition free, five day operation and maintenance course at the factory training center for a minimum of two persons. The course shall include classroom instruction using published manuals and laboratory experience using operational systems like that delivered to Owner.
3. Contractor shall provide operation and maintenance manuals for the DDC system and all peripheral equipment. Updates to all manuals shall be provided free during the warranty period.

F. Warranty

1. Contractor shall provide a one year labor and material warranty for all equipment and software. The warranty shall include on-site service and equipment repair or replacement at no charge to Owner. Response time of maintenance personnel shall not exceed 24 hours after notification of Contractor that service is needed.
2. Contractor shall provide factory trained personnel to service the DDC system and maintain a reasonable local stock of replacement parts to assure prompt and dependable repair of DDC system equipment problems.
3. The Contractor shall maintain a service center with equipment capable of communicating with the RSUs and the CCU to assist Owner personnel using dial-up telephone access.

G. Owner provided items

1. The Owner shall provide the following items:
 - a. Electric power meter with pulse output.
 - b. Dedicated telephone line at the site.
 - c. 120 VAC circuit to FIC location (wired through emergency power system)
 - d. 10 Base-T LAN Network connection

H. System Acceptance

1. The system acceptance procedure shall include as a minimum the following requirements:
 - a. Demonstrate all specified capabilities of the CCU, RSU, and RDC,
 - b. Demonstrate all operator commands and programming features,
 - c. Verify that all control points, status inputs, and analog inputs can be controlled or monitored from the RDC, UDC, RSU, and CCU locations.
 - d. Verify that all alarm inputs are properly handled.
 - e. Demonstrate program loading and parameter modification.
 - f. Demonstrate program integrity after power failure.
 - g. Demonstrate telephone communications between CCU and all RSUs whether initiated by the CCU or the RSU,
 - h. Demonstrate capabilities required by Specification.

2.6 FACILITY INFORMATION CENTER

- A. The DDC Building Management System shall be provided with a Facility Information Center (FIC) located in the Facility Operations Office or other locations as approved by Owner. The FIC shall be fully integrated into the DDC system to provide local access to all status information for the facility. The FIC shall be fully compatible with the existing CCU and shall, in no way, interfere with any of its present functions. The system shall provide colorgraphic displays of floor plans and system diagrams with equipment status, environmental conditions, and alarms.
- B. The system shall include the necessary hardware and software to serve as a service center for technical personnel involved in troubleshooting and programming

the system. This local capability shall be a permanent part of the FIC with access restricted to authorized personnel.

- C. The FIC shall communicate automatically with the DDC system and interrogate the BMS to obtain the information requested by the operator or the automatic graphical displays.

D. System Hardware

1. The FIC shall include a computer capable of running MS-DOS compatible programs and providing memory, floppy disk, hard disk, keyboard, touch panel, and VGA color display.
2. The computer shall be an industry-grade personal computer with 486 CPU or equal operating at 133 MHz minimum, 4 MB of RAM memory, 1.44 MB floppy disk, solid-state or industrial-hardened hard disk, full function keyboard, serial port, modem port, parallel printer port, 10 Base-T network port, and power supply.
3. Colorgraphic display shall be a VGA monitor with at least a 9" diagonal screen. The display shall be a flat screen color panel with 640 X 480 VGA compatible video display with active matrix thin film transistor (TFT) liquid crystal display (LCD). Passive matrix CCFT backlight screens are not acceptable.
4. The FIC shall be designed for flush wall mounting inside an interior wall. The unit shall be designed to prevent access to the service center functions of the system except by authorized personnel.
5. The Operator Input Device shall be an interactive self-contained touch screen. The colorgraphic screen shall provide selection windows guiding the operator to the desired information.
6. All LAN's and all controllers shall be accessible from the FIC location.

E. System Software

1. The FIC shall include the software required to meet the functional requirements including the information display and service center capabilities.
2. The FIC software shall provide user-friendly display of facility status information including:
 - a. Alarms
 - b. Heating/Cooling System and Equipment Status
 - c. Space and System Temperatures
 - d. Facility Schedules
 - e. Electrical Demand and Energy Usage Displays and Graphs
 - f. Trend Logs
 - g. Equipment Run Time
 - h. Help Screens with General Facility Information
 - i. Map of UDC equipment locations

- j. Detailed Sequence of Operations for all equipment
3. The software shall provide colorgraphic display of facility floor plans and HVAC systems overlaid by dynamic status information such as space temperatures and equipment operating modes and associated alarms. The FIC shall be able to store and display 999 different colorgraphic screens and each display screen shall have the capacity to display at least 100 active points. The display selection shall be by touch screen technology and shall be self-explanatory designed for use by non-technical personnel.
 4. The FIC shall provide serviceware for technician in uploading and downloading databases to the DDC system and on-line modification of operational schedules and control programs. All databases for all controllers and all LAN modules shall be stored on the FIC hard disk. The FIC shall be able to upload and download all database parameters.
 5. The FIC shall provide an automatic scan mode to present sequential colorgraphic displays without operator intervention. The presentation shall continue until interrupted by the operator. An automatic standby mode shall be provided to shutdown the display after a preselected time.
 6. The FIC shall provide Intranet Network security access and audit trailing.
 7. The FIC shall provide periodic database backups for all UDCs automatically.
 8. The FIC shall provide scheduling of all equipment directly from the Owner's existing Internet Scheduling Program.
 9. The FIC shall provide web-serving of the CCU graphics, status screens, and reports through the Owner's Intra-network.

PART 3 - SEQUENCE OF OPERATIONS

3.1 Refer to I/O Summary for control point description.

- A. Temperature control for each water source heat pump unit, W12 through W60 shall be as follows:
 1. A control module shall be provided for each heat pump unit to control the fan, compressor and reversing valve. A wall mounted temperature sensor located in the space shall provide an analog input signal to the control module.
 2. Each heat pump unit shall be programmed to start and stop according to the day/night schedule provided by the owner.
 3. Where indicated on the drawings the unit shall be started and stopped by a motion detector also.

4. The unit fan shall run continuously or cycle with a call for heating or cooling as programmed by the owner.
 5. On a rise in space temperature above the cooling set point, the water valve shall open and an end switch in the valve shall start the compressor when the valve is completely open.
 6. On a drop in space temperature below the heating set point, the water valve shall open, an end switch in the valve shall start the compressor when the valve is completely open and the reversing valve shall be in the heating mode.
 7. In the night cycle the unit fan shall be off. On a drop in space temperature below the night setting of 55°F, the fan and the heat shall start.
 8. A duct mounted temperature sensor located in the supply air duct shall provide an analog input signal to the control module to provide temperature indication only.
 9. A duct mounted smoke detector, furnished as part of the Fire Alarm system and installed in the supply air duct of each unit which supplies air to a corridor or which has a smoke damper in the duct system shall shut down the unit and close the smoke damper through an auxiliary contact in the smoke detector when smoke is present.
 10. On 30% of the water source heat pump units the water valves shall be wired to remain open at all times to provide minimum flow through the pump. Units shall be located at the ends of each main.
 11. A 24 volt ionization device shall be connected to the unit so that the ionization device is activated whenever the unit fan runs.
- B. Temperature controls for existing multi-zone roof-top units shall be as follows:
1. Existing room temperature and CO₂ sensors shall be relocated as shown on the drawings. Damper motors and damper linkage in the zone head shall be rearranged as required by the new zone layout. Relocate return air fan pressure transducer. No other control work on multi-zone units is required.
 2. A duct mounted smoke detector, furnished as part of the Fire Alarm system and installed in the supply air duct of each unit which supplies air to a corridor or which has a smoke damper in the duct system shall shut down the unit and close the smoke damper through the auxiliary contact in the smoke detector when smoke is present.
- C. Energy recovery units ERU shall be controlled as follows:

1. A control module and temperature, humidity and CO₂ sensors shall be furnished by H.I. Solutions and factory installed in Energy Recovery Units by the unit manufacturer. See Section 15400.
 2. Connect the EMS LAN to the ERU at the terminals provided on the unit.
 3. Duct mounted smoke detectors, installed in the supply air duct of the ERU shall shut down both fans in the unit and close all smoke dampers in the exhaust or supply duct system of that unit through an auxiliary contact in the smoke detector when smoke is present.
- D. Temperature control for ductless split system air conditioning unit shall be as follows:
1. A control module shall be provided for the split system air conditioning unit to start the unit. Once started the unit shall run on its own built-in sensor and operating controls. A wall mounted temperature sensor with local override button located in the space shall provide an analog input signal to the control module.
 2. The unit shall be programmed to start and stop according to the day/night schedule provided by the Owner.
 3. The unit shall run continuously in the day cycle or cycle with a call for cooling as programmed by the owner.
 4. In the night cycle the unit shall be off.
- E. Controls for exhaust fans shall be as follows:
1. Exhaust fans with control sequence SW shall be started by wall switches furnished and installed under the Electrical Section of the specifications or by switches furnished with the fan.
 2. Exhaust fans with control sequence EMS shall be started and stopped by a control module. The fans shall start and stop according to a schedule provided by the Owner.
 3. Exhaust fans with control sequence EMST shall be started and stopped by a control module. A wall mounted temperature sensor located in the space shall provide an analog input signal to the control module. On a rise in space temperature above the cooling set point, the exhaust fan shall start. Provide a relay with a 24 volt coil, 120 volt - 12 ampere contact and Nema-1 enclosure in the power wiring to the fan.

4. Exhaust fan with control sequence SWM/EMS shall be started by wall switches furnished and installed under the Electrical Section. A motor operated damper in the outside air intake hood shall open when the fan starts. Water source heat pumps serving the space shall stop when the exhaust fan starts.

F. Residential rangehood fans shall be controlled as follows:

1. Residential rangehood exhaust fans shall be started by an On-Off switch in the face of the rangehood.
2. Rangehood supply fan shall be started whenever the exhaust fan starts through auxiliary contacts in the exhaust fan motor starter.
3. An auxiliary contact in the rangehood fire extinguishing system shall be used to energize the shunt trip circuit breakers in the electrical power circuits to each piece of electrically heated cooking equipment under the hood. See electrical drawings for the location and quantity of shunt trip breakers.
4. A second auxiliary contact in the rangehood fire extinguishing system shall be used to shut down the rangehood supply fan.

G. Solenoid operated trap primers shall be controlled as follows:

1. Trap primers with a solenoid actuator are located at p-traps above the ceiling at various locations throughout the building as shown on the drawings. The trap primers are furnished under the plumbing section of the specifications. The solenoid valves operate at 24 volts and draw 6.3 watts.
2. Provide a control module to operate the trap primer solenoid valves on a schedule provided by the owner. Initially set the solenoid valves to open for 5 seconds once a day at 12:00 a.m.
3. Provide a transformer and low voltage wiring to each solenoid valve. The size of the transformer and the length and size of the wiring shall be determined by the contractor as required to operate the solenoid valves.

H. Controls for domestic water heating system shall be as follows:

1. Water heaters and hot water recirculating pumps at heaters shall be started and stopped according to a day/night schedule provided by the owner and by the demand control program.
2. A temperature sensor located in the hot water supply pipe of each water heater and in the hot water storage tank shall provide an analog input signal to the control module to provide temperature indication only.

- I. Lighting controls using remote control breakers shall be as follows:
 1. Normal building lighting shall be turned on and off by an external control panel mounted at each lighting panelboard. This control panel shall contain a control module and a 24 volt transformer. The control panel shall energize remote operated circuit breakers in each lighting panel. Power to the transformer shall be obtained from a spare breaker in the lighting panel.
 2. Lighting Panelboards equipped with remote operated circuit breakers and control wiring bus or cable to the external control panel shall be furnished under this section of the specification and installed under the Electrical section. Lighting panels shall be Cutler-Hammer model PRC as scheduled on the Electrical drawings.
 3. Lighting and air conditioning shall be turned on and off by the DDC control system according to schedules provided by the owner. In addition, in Classrooms a motion detector shall be provided as shown on the drawings. The motion detector shall be a Honeywell Model 7450C and shall be ceiling mounted. The lighting and air conditioning shall be programmed so that when the room is unoccupied after a pre-determined time interval both the lighting and air conditioning shall be turned off. When a person enters the room they shall be turned back on.
 4. Control wiring from the EMS central lighting control panel in the main mechanical room to the various external control panels mounted at each lighting panelboard shall be furnished and installed in this Section of the Specifications. See electrical drawings for locations of these Panelboards.

3.2 EXISTING CONTROLS

- A. The existing control system shall be removed in the area being renovated. Existing control devices which comply with the specifications may be reused. Remove all existing thermostats and other control devices. Where wall-mounted thermostats are removed, unless the location is covered by a new thermostat, install a blank stainless steel junction box cover over the outlet. Remove all existing control panels. Remove all existing control wiring except that existing conduit concealed inside walls may remain.

PART 4 - ELECTRICAL

- 4.1 Motors and motor starters required for proper operation of equipment covered under this section, except items specified furnished under the Electrical Section, shall be furnished under Section 15400, HVAC of the specifications. Devices which are a part of the power wiring circuit and which are not integral parts of the equipment, shall be installed under the Electrical Division.

- 4.2 Controls, relays, contactors and switches required for proper operation of equipment covered under this section, except items specified furnished under the HVAC Section or the Electrical Section, shall be furnished under this section of the specifications.
- 4.3 All control and interlock wiring including 120 volt power to control devices shall be furnished and installed under this section.
- 4.4 Power wiring to equipment, unless otherwise indicated herein before, shall be furnished and installed under the Electrical Division of the specifications.
- 4.5 Devices, materials and installation shall conform with requirements of the Electrical Division, except as specified herein.
- 4.6 All wiring shall be of adequate size for the service. The minimum size low voltage control wire for circuits operating at 50 volts or less shall be #18 AWG. The minimum size line voltage control wire shall be #14 AWG. All control wiring shall be protected against overload by fuses or circuit breakers as required by The National Electrical Code.
- 4.7 All wiring and cable installed exposed in a space, concealed inside a wall, concealed above a non-accessible ceiling or underground outside the building shall be installed in conduit. All line voltage wiring shall be installed in conduit. All low voltage wiring installed above accessible ceilings may be installed without conduit by using cable with a jacket which is U.L. listed for installation in a return air plenum.
- 4.8 Conduit and junction boxes for room sensors and certain other control devices shall be furnished and installed under the Electrical Division and are shown on the Electrical drawings. All other conduit required for the control system which is not shown on the Electrical drawings shall be furnished and installed under this section of the specifications.
- 4.9 Plenum rated cable installed in corridors shall be installed in cable hangers which are specified in Section 16100. All cables for this system shall be grouped together within the hanger and tied with a cable tie. See detail on the drawings for arrangement with other systems.
- 4.10 Plenum rated cable installed in other spaces where there are no cable hangers shall be tied to the building structure at approximately 6'-0" on center using cable ties.
- 4.11 Plenum cable shall pass through walls by drilling a hole in the wall and installing a conduit with bushings on each end through the wall. Install the cable through the conduit and in fire or smoke rated walls, seal the opening around the conduit and the hole in the conduit with a U.L. listed fire rated sealant.
- 4.12 All plenum rated cable used for the control system shall have a white or clear outer jacket. All cable ties shall be plenum rated.
- 4.13 All wiring shall be color coded or identified with tab markers.
- 4.14 Junction box covers concealed above ceilings or exposed in mechanical or electrical rooms shall be labeled using black indelible marker to indicate which units are served by the control circuits contained in the box. Do not label device plates in finished areas.

4.15 A polyolefin fish wire shall be pulled into each empty conduit.

4.16 Wall mounted sensors shall be installed 4'-0" above the finished floor.

4.17 All devices shall be labeled as to the services.

End of Section 15500

SECTION 16100

ELECTRICAL

PART 1 - GENERAL

1.1 CODES

- A. Work covered by this section of the specifications shall conform to NFPA 70, the National Electrical Code, 2005 edition with 2006 amendments.

1.2 STANDARDS FOR MATERIALS

- A. All material shall be new and shall be listed by the Underwriters' Laboratories, Inc., as conforming to its standards in every case where such a standard has been established for the particular type of material in question or except as otherwise specified or implied herein.

1.3 SHOP DRAWINGS

- A. Where equipment is specified herein or on drawings, by manufacturers' names or numbers, this shall denote minimum requirements as to quality, type, capacity, function, and performance. All equipment must have the Engineer's approval before ordering. Submit not less than six (6) copies of submittal data on all equipment and materials.
- B. Submittals shall be bound in a binder with index tabs and shall include a cover sheet for each piece of equipment itemizing equipment features to show compliance with or deviation from the requirements contained in the specifications and drawings.

1.4 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. The Contractor shall furnish not less than three (3) copies of operating and maintenance instructions for all equipment he has furnished and installed.

1.5 TESTING

- A. Before any work is started, the Contractor shall test all existing electrical systems to which work is to be done, i.e., the Master Television System, Communications/Program System and Fire Alarm System to confirm that they are in good working order. Any defects shall be reported to the Gwinnett County Board of Education Maintenance Department before the Contractor begins any work. If no defects are reported, the systems shall be assumed to be in good working order.
- B. At the completion of the work, a thorough test shall be made in the presence of the Engineer or his representative, with all equipment, machinery, and appliances in operation and free from defects.
- C. The Contractor shall uncover all concealed areas and remove all panelboard covers during inspection if requested.

1.6 EXCAVATION AND BACKFILL

- A. All excavation and backfill for work under this section shall be in accordance with the Site Grading section of the specifications.

1.7 UTILITY CONNECTIONS

- A. Connect to the existing utilities as indicated on the drawings.

1.8 ELECTRICAL SYSTEM CHARACTERISTICS

- A. Electrical system characteristics shall be as indicated on the drawings.

PART 2 - PRODUCTS

2.1 FIXTURE OUTLETS, PULL BOXES AND CONDUIT JUNCTION BOXES

- A. Furnish and install all outlet boxes and junction boxes, as indicated on the drawings or as required. The approximate locations of the outlets are shown on the plans. The right is reserved to change the exact location of any switch, ceiling outlet, or other outlet in any area before it is permanently installed. Contractor shall specifically verify all door swings and install all lighting switches as approved. Boxes for fixtures and devices shall be securely attached to the building structure, using wood screws for wood construction, expansion bolts for concrete, and bolts or galvanized clamps for steel construction. Boxes set in concrete or masonry shall be secured in place with cement mortar.
- B. Ceiling outlet boxes shall be code gauge galvanized steel and shall be 4" octagon boxes, 1-1/2" deep minimum, larger where required.
- C. Switch and receptacle outlet boxes concealed in walls shall be standard utility or gang boxes except that outlet boxes installed in tile or exposed masonry walls shall be square corner boxes. Sectional switch boxes shall not be used. Outlet boxes installed in concrete or concealed masonry shall be provided with 1" deep plaster cover. The box shall be positioned so that concrete or mortar shall fill around the plaster cover and the device plate can be installed flush with the finished surface. Single switches shall be installed in utility boxes without plaster covers.
- D. Switch and receptacle boxes exposed on walls shall be cast iron type with threaded hubs and sheet steel covers.
- E. Junction boxes and pull boxes installed outside and exposed to the weather or underground shall be constructed of polymer concrete reinforced with fiberglass with bolt on covers.
- F. Pull boxes shall be installed in conduits as needed so that pulls do not exceed 180 feet in length or 360° of bends.
- G. Locate all boxes so that covers are accessible and removable. Boxes shall be equipped with cover plates of the correct type and size for the box. All unused knockouts shall be plugged.

2.2 CONDUITS

- A. All wiring shall be installed in conduit unless otherwise specified herein. All conduit shall be U.L. listed.
- B. All conduit installed inside the building and above grade shall be galvanized steel electrical metallic tubing except where rigid or intermediate steel conduit is shown on the drawings or required by code or by other paragraphs in the specifications.

- C. All conduit installed exposed below 6'0" in a mechanical room, kitchen or in an area subject to damage shall be rigid or intermediate steel conduit with threaded connections.
- D. All conduit installed underground outside the building or in or under the building floor slab on grade shall be schedule 40 rigid PVC conduit except where indicated otherwise. Conduit shall be placed below the slab and vapor barrier and not within the slab. Vertical penetrations are allowed.
- E. Where PVC conduit turns up through the slab inside a wall, the PVC conduit shall extend up to the first junction box. Where PVC conduit turns up exposed, steel conduit shall begin at a point 2" below the slab.
- F. A green ground wire of the size required by Table 250-95 in the National Electrical Code shall be installed in every PVC conduit used for current carrying conductors.
- G. Conduit underground outside the building shall be installed a minimum of 24" below grade. All joints and connections shall be sealed water tight.
- H. Install warning tapes 12" above all underground conduit. Warning tapes shall be T&B/Westline NA-0608 (yellow) for electric lines, NA-0602 (orange) for telephone or cable TV lines and NA-0606 (red) for high voltage primary by power company or approved equal by Brady or Seton.
- I. Conduits shall be supported on not more than 8'0" centers when concealed and 5'0" centers when exposed. Conduits shall be supported by means of approved galvanized iron clamps or hangers, attached to masonry with inserts and bolts or lead expansion shields or to structural members by means of approved galvanized iron clamps or hangers. Where installed exposed, conduits shall be parallel with, or at right angles to walls or ceilings.
- J. Except where terminating in a threaded hub fitting, all conduits shall terminate in outlet boxes, junction boxes, pull boxes, cabinets, etc., with one locknut installed outside the box and one locknut and a bushing inside the box. The locknuts shall be tight to make both a mechanical and electrical connection. Bushings for all rigid conduit shall be insulating end bushing, and shall be grounding type where required.
- K. EMT coupling and box connectors shall be steel compression type with insulated throat, U.L. listed raintight and concretetight. Connectors shall be as manufactured by Appleton, Efcor, O.Z., Raco, Steel City, or T&B.
- L. An polyolefin fish wire shall be pulled into each empty conduit.

2.3 FLEXIBLE CONDUIT

- A. Furnish and install flexible metal conduit connections to all motors and to all equipment subjected to vibration. Minimum size shall be 1/2". Length shall be approximately 15" minimum and shall not exceed 6'0" maximum.
- B. Nominal size 3/8" flexible metal conduit in lengths not exceeding 6'0" may be used for connecting individual lighting fixtures.
- C. Provide "Sealtight" conduit and Appleton, Ideal or T&B liquid-tight fittings at all flexible connections subject to weather or in wet locations in mechanical rooms or kitchen.
- D. Install a green ground conductor in each piece of flexible conduit. The conductor shall be of the size required by the National Electrical Code.

2.4 CONDUCTORS FOR CONDUIT SYSTEMS

- A. Furnish and install all wire, cable and conductors required for the electrical installation. All conductors shall be copper. All sizes shall be AWG. Minimum size for power and lighting circuits shall be #12. All conductors #10 and smaller shall be solid. Minimum size for low voltage (24 volts) control circuits shall be #18. Minimum size for 120 volt control circuits shall be #12. Minimum insulation rating on all conductors shall be 600 volts. Insulation shall be as follows, except as otherwise noted on the drawings:

Feeders	Type THHN/THWN
Branch Circuits	Type THHN/THWN

- B. Branch circuit conductors shall be color coded as follows:
 - 1. 208Y/120 Volt System: Phase A - black, Phase B - red, Phase C - blue, Neutral - white, Ground - green, Isolated ground - green with yellow stripe.
 - 2. 480Y/277 volt system: Phase A - brown, Phase B - Orange, Phase C - yellow, Neutral - gray, Ground - green, Isolated ground - green with yellow stripe.
- C. Feeder and service entrance conductors shall be color coded by the use of colored plastic tape applied within 6" of each conductor end or tap. Color coding conductor markers shall be Brady, Ideal or T&B Westline.
- D. Lubricants shall be used on all feeder cables and as otherwise required to facilitate the pulling of wires. Lubricants shall be specifically identified on the label as being wire or cable pulling lubricants.

2.5 TYPE MC CABLE

- A. Type MC cable may be used in place of EMT only for the following applications where the wiring is concealed inside the building, above a ceiling or concealed inside a wall.
 - 1. Vertical drops from overhead junction boxes down to light fixtures.
 - 2. Vertical drops from overhead junction boxes down to receptacles in walls and horizontally through stud walls.
 - 3. Vertical drops from overhead junction boxes down to motors or other equipment.
 - 4. As a substitute for flexible conduit in concealed spaces or exposed at mechanical equipment in dry locations.
- B. Type MC cable where allowed in paragraphs 1 through 4 above shall be installed in accordance with ARTICLE 334 of the National Electrical Code. Conductors shall be copper. Insulation shall be rated at 600 volts and 90°C.

2.6 WIRING CONNECTORS

- A. Splices, joints and taps in outlet boxes, pull boxes, or wiring troughs shall be made with wire nut for connectors for conductors #8 and smaller. Joints or taps in conductors larger than #8 shall be made with tin plated aluminum alloy set screw connectors or compression type connectors, each with 600 volt insulating covers.

2.7 WIRING TROUGHS

- A. Furnish and install all necessary wiring troughs at panels, starter or built-up control center locations, and where noted on the drawings. The troughs shall be of adequate length and size to contain all power wiring and control wiring.
- B. Wiring troughs shall be steel, code gauge, all seam welded, no knock-outs, and with screw cover.

2.8 SUPPORTS

- A. Provide and install supports for all equipment and materials installed under these specifications. Supports shall be steel angle or channel or Kindorf or Unistruct channel and fittings as approved. Minimum size rods shall be 1/4".

2.9 PANELBOARDS

- A. Furnish and install all panelboards as scheduled on the drawings. Panelboards shall be surface or flush mounted as indicated and shall have front trim with doors and latches. Panelboards shall have door-in-door front trim where front is hinged to box.
- B. Panelboards shall be U.L. labeled.

- C. Branch circuit breakers or switches shall be arranged in the panelboards as scheduled on the drawings and branch circuit conductors shall be connected to panelboards by branch circuit number as scheduled. A typewritten directory of circuit numbers shall be installed under clear plastic inside each panelboard door. Directories shall indicate the type of load served and the room number of the rooms served by the circuit. Spares shall be noted on directories in pencil. Provide two keys for each panelboard.
- D. Lighting control panels shall be provided where scheduled on the drawings. Lighting control panels shall have remote operated circuit breakers and breaker control bus or connection cable for connecting control wiring to an external controller. The external controller and 24 volt power supply transformer shall be furnished under Section 15500, Direct Digital Temperature Control system.
- E. Provide laminated plastic labels on panelboard doors.
- F. Panelboards shall be as manufactured by General Electric or approved equal by Cutler-Hammer, Siemens or Square-D.
- G. Lighting panelboards containing circuit breakers with built-in contactors for lighting control shall be manufactured by Cutler-Hammer and shall be furnished under Section 15500 Direct Digital Control System. The panels shall be installed under the Electrical section.

2.10 EXISTING PANELBOARDS

- A. Where indicated on the drawings, existing panelboards shall be reused. Rearrange existing circuit breakers and install new circuit breakers as required by the drawings. New branch circuit breakers shall be manufactured by the original panelboard manufacturer and shall have the same short circuit rating as the existing breakers.
- B. Branch circuit breakers or switches shall be arranged in the panelboards as scheduled on the drawings and branch circuit conductors shall be connected to panelboards by branch circuit number as scheduled. A typewritten directory of circuit numbers indicating new breakers and changes to existing breakers shall be installed under clear plastic inside each panelboard door. Directories shall indicate the type of load served and the room number of the rooms served by the circuit. Spares shall be noted on directories in pencil.

2.11 DRY TYPE TRANSFORMERS

- A. Furnish and install dry type, totally enclosed, self-cooling transformers as scheduled on the plans. Enclosures shall be ventilated on 30 kva and larger units.
- B. Transformers 30 kva and larger shall have 220°C temperature class insulation and shall be rated for a 150°C rise and a 40°C ambient unless otherwise indicated on the drawings.
- C. Transformers 150 kva and larger which are not located in fire rated electrical rooms shall have 150°C temperature class insulation and shall be rated for an 80°C rise and a 40°C ambient.

- D. Basic impulse level shall be 10 kv. Sound level shall not exceed NEMA standard sound levels of 45 dB up to 50 kva, 50 dB up to 150 kva and 55 dB up to 300 kva.
- E. Provide vibration isolation pads under each corner of the transformer.
- F. Transformers shall be as manufactured by General Electric or approved equal by Cutler-Hammer, Siemens or Square-D.

2.12 CIRCUIT BREAKERS

- A. Furnish and install all individually mounted circuit breakers as indicated on the drawings. Circuit breakers shall have NEMA-1 enclosures, surface or flush mounted as indicated. Circuit breakers shall be as manufactured by General Electric or approved equal by Cutler-Hammer, Siemens or Square D.

2.13 SAFETY SWITCHES

- A. Furnish and install all fusible or non-fusible safety switches as indicated on drawings. Safety switches shall be general duty type with NEMA 1 enclosures when installed inside the building and NEMA 3R raintight enclosures when installed outside. Safety switches shall have the number of poles, wires and voltage rating for the load served and shall have ground lugs. Safety switches shall be as manufactured by General Electric or approved equal by Cutler-Hammer, Siemens or Square-D.

2.14 FUSES

- A. Fuses for all motor branch circuits shall be Bussmann "Fusetron", size and voltage as noted on the drawings.
- B. Install labels in all fused devices indicating proper size and type installed under this contract.
- C. Fuses shall be Bussmann as scheduled above or approved equal by Gould-Shawmut, Littlefuse or Cefco.

2.15 MOTOR STARTERS

- A. Install and connect all separately mounted motor starters and variable speed drives provided under other sections of the specifications.

2.16 MOTORS, EQUIPMENT, CONTROLS, AND CONTROL WIRING

- A. All fan motors, air conditioning units, heating units, etc. will be furnished and installed under other sections of these specifications.
- B. Provide power connections for all equipment furnished and installed under other sections of these specifications.

- C. Provide control wiring, conduit and junction boxes only where noted on the drawings.
- D. The installation, connection, and operation of controls not noted on the drawings will be done under other sections of the specifications, including the furnishing and installing of conduits, wiring, outlet boxes, control components and all connections.
- E. Control wiring shall be in accordance with the drawings and/or manufacturer's certified and approved wiring diagrams.
- F. Control wiring shall be marked with "E-Z" tape markers at all terminal points.

2.17 FIXTURES

- A. Furnish and install all fixtures as indicated on the drawings and scheduled. Fixtures shall be equipped with all hanging and mounting accessories required for complete installation. All fixtures recessed in plastered ceilings shall be provided with plaster frames.
- B. Where indicated on the drawings in the lighting fixture schedule certain light fixtures are to be purchased through Addison-Parrish Lighting Sales & Design, Rob Whaley, 4888 South Old Peachtree Road, Norcross, GA 30071, Phone 770-458-9911. The price for these fixtures is shown in the Lighting Fixture schedule. The price includes lamps and ballast. All other fixtures may be obtained through any source.
- C. All fixtures recessed in acoustical tile ceilings shall be provided with the proper mounting flanges for installation in the type ceiling specified. Install a minimum of two safety chains on each four foot section of lay-in type light fixture. Chains shall be #12 steel jack chain with a working load limit of 29 pounds. Chains shall be installed on opposite corner of fixture, shall connect to steel bar joist above and shall have enough slack that fixture is not supported by chain. Chains shall be furnished for all lay-in type fixtures.
- D. All ballasts for fluorescent fixtures shall be electronic, parallel wired, energy saving type. Ballast shall be U.L. listed, Class P and CBM certified. Sound levels shall not exceed Class A ambient noise levels. Ballast shall meet FCC rules and regulations, Part 18, Class A. Power factor shall be 90% or above. Ballast case temperature shall not exceed 25°C rise over 40°C ambient. Ballast shall maintain constant light output through $\pm 25\%$ input voltage variations. Input current total harmonic distortion shall not exceed 20%. Ballasts shall be as manufactured by Advance, Motorola, MagneTek or Valmont.

2.18 LAMPS

- A. Furnish and install all lamps as indicated on the drawings and scheduled. Incandescent lamps shall be voltage, size and type as indicated on the drawings or required. Fluorescent lamps shall be of size and type as indicated on the drawings. Lamps shall be as manufactured by Phillips, Sylvania or General Electric.

2.19 WIRING DEVICES AND RECEPTACLES

- A. Furnish and install all wiring devices and receptacles except as noted otherwise. Devices shall be as scheduled on the drawings, and shall be as manufactured by Hubbell, Arrow-Hart, General Electric, Leviton or Pass & Seymour.

2.20 PHASE FAILURE RELAYS

- A. Phase failure relays shall be used to monitor lighting panels and turn on emergency lights if any phase fails. Phase failure relays shall be single pole NO-NC and shall be energized if any phase voltage varies more than +15/-20% of nominal voltage.
- B. Phase failure relays shall be General Electric type RSFF or approved equal by Cutler Hammer, Siemens or Square-D.

2.21 OUTLET AND DEVICE PLATES

- A. Furnish and install outlet and device plates on all junction boxes. Plates for concealed outlets shall be 0.032" satin finish stainless steel. Plates for exposed outlets shall be sheet steel suitable for outlet use. Finish on screws shall match finish on plate or cover. All device plates shall be jumbo size plates. Install blank covers on all unused outlets.

2.22 TELEPHONE SYSTEM

- A. Furnish and install a conduit system, including telephone panel, outlets, and conduits, as indicated on the drawings. A polyolefin fish wire shall be pulled into each empty conduit for telephone system and left for use by others. All conduit for telephone system shall be a minimum of 3/4" unless otherwise indicated on the drawings. All work shall be in accordance with the Telephone Company's requirements. Blank covers shall be provided for unused wall outlets.

2.23 CABLE HANGERS

- A. Furnish and install cable hangers to support low voltage plenum rated cables for systems provided in other sections of the specifications.
- B. Cable hangers shall be installed in corridors above accessible ceilings at 3'-0" on center as required for low voltage systems.
- C. Cable hangers shall be metal hangers of the size and configuration indicated on the drawings and as manufactured by Mono-Systems or approved equal by Atlas, B-Line or SoSpec. Install hangers to walls using bolts or screws and masonry anchors.

2.24 TRANSIENT VOLTAGE SURGE SUPPRESSOR

- A. Surge suppressors shall be of the type scheduled on the drawings and as manufactured by Current Technology. Surge suppressors shall have U.L. 1449 clamping levels not to exceed the values scheduled. Surge current ratings shall be as scheduled and all modes (L-N,L-L,L-G,N-G) shall be protected. The ANSI C62.41-1994 category C3 clamping levels shall not exceed 1250 volts (L-N) for 480Y/277V units or 900 volts (L-N) for 208Y/120V units. All ratings shall be with options and accessories noted in the schedule.

- B. Surge suppressors shall have a U.L. 1283 listed high frequency noise power filter with a minimum effective frequency range of 50KHz to 100MHz. Noise attenuation levels shall be greater than 30dB throughout the range, peaking at greater than 50dB.
- C. Approved equal surge suppressors as manufactured by Advanced Protection Technology, Cutler Hammer, EFI, General Electric, LEA, Liebert, Northern Technology, Siemens, Square-D, Surge Suppression of Georgia or Tycor are acceptable. Submittals shall include independent test values for all information in the schedule.

2.25 LABELING

- A. Provide laminated plastic labels on all equipment including panelboards, disconnect switches, motor starters, motor control center and control panels furnished under HVAC section. Lettering shall be 3/8" high. Labels shall be black with white core on 208Y/120V panels and red with white core on 480Y/277V panels.
- B. Junction box covers concealed above ceilings or exposed in mechanical or electrical rooms shall be labeled using black indelible marker to indicate which circuits are contained in the box. Do not label device plates in finished areas.

2.26 GROUNDING

- A. All wiring systems including conduit, panelboards, safety switches, lighting fixtures and wiring devices shall be grounded in accordance with Article 250 of the National Electrical Code.
- B. The neutral conductor shall be grounded at the supply side of the service disconnecting device by connecting the grounding conductor indicated on the drawings to the neutral inside the service disconnect device enclosure.
- C. All splices in grounding conductors shall be made with T&B compression connectors. All connections to equipment and boxes shall be made with T&B two bolt hole compression lugs. Connections to water pipes or ground rods shall be made with T&B heavy duty ground clamps. Approved equal devices by Burndy, Dossert, or Ideal are acceptable.

End of Section 16100

SECTION 16150
FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 CODES

- A. Work covered by this section of the specifications shall conform to NFPA 70, the National Electrical Code, 2005 edition with 2006 amendments and NFPA 72, the National Fire Alarm Code 2002 edition.

1.2 STANDARDS FOR MATERIALS

- A. All material shall be new and shall be listed by the Underwriters' Laboratories, Inc., as conforming to its standards in every case where such a standard has been established for the particular type of material in question or except as otherwise specified or implied herein.

1.3 SHOP DRAWINGS

- A. Where equipment is specified herein or on drawings, by manufacturers' names or numbers, this shall denote minimum requirements as to quality, type, capacity, function, and performance. All equipment must have the Engineer's approval before ordering. Submit not less than six (6) copies of submittal data on all equipment and materials.
- B. Submittals shall be bound in a binder with index tabs and shall include a cover sheet for each piece of equipment itemizing equipment features to show compliance with or deviation from the requirements contained in the specifications and drawings.
- C. Shop drawings shall contain specification data sheets on each individual system component and wiring diagrams indicating all system components. Wiring diagrams shall show point to point wiring and the number and size of all conductors.
- D. Shop drawings shall be submitted to and approved by the Georgia State Fire Marshal before any work is started.

1.4 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. The Contractor shall furnish not less than three (3) copies of operating and maintenance instructions for all equipment he has furnished and installed.
- B. All software, keys or tools required to program, install and maintain the system shall be turned over to the owner.

1.5 FIRE ALARM SYSTEM - SEQUENCE OF OPERATION

- A. Furnish and install an addressable, hard wired True Alarm supervised fire alarm system.
- B. The operation of any initiating device shall initiate the following:
 - 1. Cause a LCD to flash on the Fire Alarm Control Panel.
 - 2. Cause all alarms to sound and all visual alarms to flash.
 - 3. Release all magnetically held smoke doors.
 - 4. Provide a signal to the Intercom system for tone generation.
 - 5. Cause a LCD to flash on the remote annunciator panel.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The fire alarm system shall be as manufactured by Simplex and shall be compatible with the existing system.
- B. Approved equal fire alarm systems by Edwards or Faraday are acceptable. If systems by these manufacturers are provided the entire existing Simplex system throughout all buildings on the campus must be removed and replaced with components by a single manufacturer throughout.

2.2 EXISTING FIRE ALARM SYSTEM

- A. The existing fire alarm system in the existing building is Simplex addressable system. The existing fire alarm control panel is a Simplex 4100U. The existing control panel and power extender panels may be reused. All other components of the existing system including initiation and alarm devices, wiring and unused conduit exposed or concealed above the ceiling shall be removed and replaced as shown on the drawings. New initiation devices shall be connected to the existing addressable control panel as indicated on the drawings. Provide power extender panels for the notification zones as required by the number of devices installed.
- B. Before any work is started, the contractor shall test the existing Fire Alarm System to confirm that it is in good working order. Any defects shall be reported to the Gwinnett County Board of Education Maintenance Department before the contractor begins any work. If no defects are reported, the system shall be assumed to be in good working order.

2.3 FIRE ALARM SYSTEM COMPONENTS

- A. Add a digital communicator to the existing fire alarm panel to communicate with the fire department.
- B. Power extender panels shall have four general alarm circuits rated at 2 amps @ 24 VDC each. Provide as many power extender panels as required by the number of notification devices. At each panel install an annunciator module to provide a trouble signal.
- C. Remote annunciator shall have 80 character liquid crystal display, switches for acknowledgment, alarm silence and reset switch. Provide a separate switch which shall be programmed and labeled as a drill switch.
- D. Pull stations shall be addressable type with mechanical latch and manual reset.
- E. On each manual pull station provide a protective shield with horn and battery for flush mounted stations and also with spacer where stations are surface mounted.
- F. Combination alarm horn and strobe units shall be vibrating horn and strobe light. Alarm horns shall produce 80 decibels. Strobes shall be 15 cd in corridors and rooms up to 20'x20', 60 cd in rooms up to 40'x40'. In larger rooms the candella shall be as shown on the drawings.
- G. On each audible and/or visual alarm unit in the gymnasium provide a wire guard.
- H. Exterior horns shall have weatherproof boxes and shall be rated for outdoor use.
- I. Visual only strobe light shall be 15 cd in corridors and rooms up to 20'x20', 60 cd in rooms up to 40'x40'. In larger rooms the candella shall be as shown on the drawings.
- J. Magnetic door holders shall be Rixson 998, semi-flush, long latch wall mounted type. Mount holders 6' 0" AFF.
- K. Smoke Detectors shall be quick connect photo-electric detector heads with bases. Smoke detectors at elevator lobbies shall have relay sub-base.
- L. Duct mounted smoke detectors shall be mounted in duct housing with sampling tube mounted in the duct. Each detector shall have a SPDT 3 AMP, 120 volt relay contact for direct interlock with the unit served. Each detector shall have a remote indicator mounted in the wall below the detector.
- M. Individual addressable modules shall be provided with surface mounted enclosures for water flow switches, tamper switches, or elevator control to initiate fireman's emergency return.
- N. Water flow switch and tamper switch shall be furnished under Sprinkler Section of specifications and connected to the fire alarm system.

- O. Surge suppressors shall be Ditek DTK-120 HW. Provide surge suppressors on the control panel and on any circuit extended outside the building underground or overhead.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The fire alarm system wiring shall be installed in accordance with the manufacturer's approved shop drawings.
- B. All wiring shall be color-coded uniformly throughout.
- C. All wiring shall be installed in accordance with NFPA 70, NEC, Article 760, paragraphs A & C, Power-Limited Fire Protective Signaling Circuits.
- D. All conductors shall be copper. Wire sizes and types shall be as indicated on the drawings. Terminations shall be made with crimp-on connectors.
- E. All wiring and cable installed exposed in a space, concealed inside a wall, concealed above a non-accessible ceiling or underground outside the building shall be installed in conduit. All line voltage wiring shall be installed in conduit. All low voltage wiring installed above accessible ceilings may be installed without conduit by using cable with a jacket which is U.L. listed for installation in a return air plenum.
- F. Plenum rated cable installed in corridors shall be installed in cable hangers which are specified in Section 16100. All cables for this system shall be grouped together within the hanger and tied with a cable tie. See detail on the drawings for arrangement with other systems.
- G. Plenum rated cable installed in other spaces where there are no cable hangers shall be tied to the building structure at approximately 6'-0" on center using cable ties.
- H. Plenum cable shall pass through walls by drilling a hole in the wall and installing a conduit with bushings on each end through the wall. Install the cable through the conduit and in fire or smoke rated walls seal the opening around the conduit and the hole in the conduit with a U.L. listed fire rated sealant.
- I. All plenum rated cable used for the Fire Alarm system shall have a red outer jacket. All cable ties shall be plenum rated.
- J. Smoke detector heads shall not be installed until the final test of the system and all dust creating construction has ceased in that area. Heads installed prematurely will be removed and cleaned according to manufacturer's instructions.

3.2 TESTING

- A. The manufacturer's authorized representative shall provide supervision of final system panel connections, perform a complete functional test of the system and submit a written report to the contractor attesting to the proper operation of the system.
- B. Perform all test necessary to meet the requirements of the local authorities having jurisdiction.
- C. Upon completion of the installation, the contractor shall provide to the architect a copy of the manufacturer's written report along with a signed written statement attesting that all system equipment was installed in accordance with these specifications and in accordance with wiring diagrams, instructions and directions provided to the contractor by the manufacturer.

3.3 LABELING

- A. Label each device (initiating, signaling or circuit) with its associated address inside the housing or on the connecting junction box.
- B. Program the software to indicate the location or room number of each device.
- C. A 18" x 24" drawing of the building floor plan showing the location and address of all fire alarm devices shall be framed under glass and installed next to the Fire Alarm Control Panel, or remote annunciator located in the administration area.

3.4 INSTRUCTIONS

- A. Provide one "Instructions and Training Session" with the Owner's designated personnel. Give instructions on system wiring, operation, function and maintenance.
- B. Provide one "Instructions and Training Session" with the local authorities having jurisdiction as to the system's function and operation.

3.5 TRAINING

1. The contractor shall provide, at no additional charge to the owner, a minimum of eight(8) hours of onsite instruction to familiarize up to six(6) Owner personnel with the capabilities, operation, trouble shooting, and routine maintenance of the fire alarm system. The instruction shall include equipment function descriptions, installation procedures, system start-up, system operation, system trouble shooting and any other information related to improving system reliability (i.e. eliminating interruptions to educational process and identifying contingency plans for major system malfunctions).
2. In addition to the above requirements, in the event that the company proprietary systems are installed (i.e. microprocessors, programmable logic boards, etc.), the Contractor shall provide, at no additional charge to the Owner, factory training for four(4) maintenance personnel to at least the intermediate level of competency. If the training is out of state, the Owner will pay all travel and living expenses. Training must be completed prior to Owner occupancy.

End of Section 16150

SECTION 16200

MASTER TELEVISION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.
- B. Coordinate with other divisions of this specification where applicable.

1.2 CODES

- A. Work covered by this section of the specifications shall conform to NFPA 70, the National Electrical Code, 2005 edition with 2006 amendments.

1.3 STANDARDS FOR MATERIALS

- A. All material shall be new and shall be listed by the Underwriters' Laboratories, Inc., as conforming to its standards in every case where such a standard has been established for the particular type of material in question or except as otherwise specified or implied herein.

1.4 SHOP DRAWINGS

- A. Where equipment is specified herein or on drawings, by manufacturers' names or numbers, this shall denote minimum requirements as to quality, type, capacity, function, and performance. All equipment must have the Engineer's approval before ordering. Submit not less than six (6) copies of submittal data on all equipment and materials.
- B. Submittals shall be bound in a binder with index tabs and shall include a cover sheet for each piece of equipment itemizing equipment features to show compliance with or deviation from the requirements contained in the specifications and drawings.
- C. A one line drawing of the entire new Television System shall be included in the submittal showing the signal levels in dBmV at the input and output of each device at the headend, tap-offs, splitters, and room outlets. The model numbers of all components shall be included in the one line drawing. Submittals not having this drawing shall be rejected without further review.

1.5 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. The Contractor shall furnish not less than three (3) copies of operating and maintenance instructions for all equipment he has furnished and installed.

1.6 SERVICE FACILITIES

- A. The Television Contractor shall be an authorized distributor for the equipment supplied under this contract. The Contractor shall maintain his own service organization under his direct control capable of furnishing service under the warranty as herein specified. A letter shall be included in the submittal stating the above is valid.

1.7 DESCRIPTION OF SYSTEM

- A. Furnish and install new television outlets and connect to the existing Television Cable System as indicated on the drawings.
- B. The system shall be designed for a 50 db signal-to-noise ratio and shall provide a signal level of a minimum of +6dbmv and a maximum of +10dbmv at each outlet.
- C. The equipment shall be as manufactured by Blonder Tongue or approved equal by Jerald or Scientific Atlanta.

PART 2 - PRODUCTS

- 2.1 VHF AMPLIFIER - shall be of the push pull type. Its output capability shall be at least +50 dbmv. Its gain shall be 50db which may be adjusted down to 41 db with the variable attenuator. Gain and slope controls shall be located on the front panel for easy set-up and adjustment. Two -30db backmatched test points shall be provided to permit testing without interruption of service. Unit shall be furnished with return filter set, flat attenuator, return amplifier and cable equalizer. Blonder Tongue Model BIDA550-50 with the following plug-in accessories 54071/54111/5402/5414.
- 2.2 SPLITTER/COMBINER - shall be hybrid type, having essentially flat response across the frequencies utilized on the system. All devices shall be housed in environment proof and radiation proof housing. All devices shall have "F" type fittings. Blonder Tongue Model SXRS series.
- 2.3 TAP-OFF - shall be of the directional coupler type. They shall be mounted on the wall above the ceiling of hallways. Feeder lines shall run from the taps to outlets in the rooms as shown on the plans. The tap-offs shall exhibit five (5) isolation factors and shall have "F" type connectors. Blonder Tongue SRT series.
- 2.4 TV OUTLET - shall be an all channel feed through unit (Odb) for connecting the TV signal to the owner furnished television set. The unit shall have "F" type connector which shall accept the CAC-6 type cable specified herein. An ivory plastic saddle shall be furnished and the outlet adaptable to the duplex coverplate specified herein, Blonder Tongue Model V-1P-FT.
- 2.5 TERMINATING RESISTOR - shall be installed at all unused ports and feeder line ends. The devices shall be 75 ohms impedance and of the "F" type connector. Blonder Tongue Model FBT SERIES.
- 2.6 WIRING & CABLE

- A. All wiring shall be installed in conduit. Cable shall be 75 ohms nominal impedance and shall be tested by the manufacturer. The cable from drop to outlet shall be RG6/U or RG11/U type as scheduled on the drawings.
- B. All wiring and cable installed exposed in a space, concealed inside a wall, concealed above a non-accessible ceiling or underground outside the building shall be installed in conduit. All line voltage wiring shall be installed in conduit. All low voltage wiring installed above accessible ceilings may be installed without conduit by using cable with a jacket which is U.L. listed for installation in a return air plenum.
- C. Plenum rated cable shall be West Penn or approved equal by Comscope or ATT.
- D. Plenum rated cable installed in corridors shall be installed in cable hangers which are specified in Section 16100. All cables for this system shall be grouped together within the hanger and tied with a cable tie. See detail on the drawings for arrangement with other systems.
- E. Plenum rated cable installed in other spaces where there are no cable hangers shall be tied to the building structure at approximately 6'-0" on center using cable ties.
- F. Plenum cable shall pass through walls by drilling a hole in the wall and installing a conduit with bushings on each end through the wall. Install the cable through the conduit and in fire or smoke rated walls seal the opening around the conduit and the hole in the conduit with a U.L. listed fire rated sealant.
- G. All plenum rated cable used for the Television system shall have a natural or beige outer jacket. All cable ties shall be plenum rated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The Television Contractor shall conduct an operating test and the system shall be demonstrated to operate in accordance with the requirements of the specifications. Provide a computer/meter print out for each outlet showing the parameters for Channels 2, 13 and 36. The test shall be performed in the presence of an authorized representative of the school system whose name shall be included in the report of the test.
- B. A letter from the Television Contractor shall certify the system is operating within the specified requirements, and the system has been accepted by the school systems representative.

End of Section 16200

SECTION 16 300

INTERCOMMUNICATIONS AND PROGRAM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.
- B. Coordinate with other divisions of this specification where applicable.

1.2 CODES

- A. Work covered by this section of the specifications shall conform to NFPA 70, the National Electrical Code, 2005 edition with 2006 amendments.

1.3 STANDARDS FOR MATERIALS

- A. All material shall be new and shall be listed by the Underwriters' Laboratories, Inc., as conforming to its standards in every case where such a standard has been established for the particular type of material in question or except as otherwise specified or implied herein.

1.4 SHOP DRAWINGS

- A. Where equipment is specified herein or on drawings, by manufacturers' names or numbers, this shall denote minimum requirements as to quality, type, capacity, function, and performance. All equipment must have the Engineer's approval before ordering. Submit not less than six (6) copies of submittal data on all equipment and materials.
- B. Submittals shall be bound in a binder with index tabs and shall include a cover sheet for each piece of equipment itemizing equipment features to show compliance with or deviation from the requirements contained in the specifications and drawings.
- C. Submittals shall include drawings of the system and all its components including wiring diagrams, schematics and interconnections.

1.5 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. The Contractor shall furnish not less than three (3) copies of operating and maintenance instructions for all equipment he has furnished and installed. The manuals shall include internal schematics and wiring diagrams, detailed to allow a technician to install, operate, maintain, calibrate and repair the equipment. (New equipment only)

1.6 SERVICE FACILITIES

- A. Contractor shall make available to the Owner a Service Department of a duly authorized distributor of the equipment manufacturer, which shall stock the manufacturer's standard parts.

1.7 EQUIPMENT MANUFACTURER

- A. The equipment specified is based on equipment as manufactured by Rauland and furnished by Richardson Associates, Atlanta, Georgia, the local authorized distributor.

1.8 DESCRIPTION OF SYSTEM

- A. There is an existing Rauland Communication System with a call back feature presently installed and operating satisfactorily within the school.
- B. Furnish and install new speakers, each with call back in the new areas and connect them to existing intercom system as indicated on the drawings.
- C. Install new switches in the existing intercom system console to receive the new speakers.

PART 2 - PRODUCTS

- 2.1 ROOM SELECTOR PANEL - Rauland Model SWL25 shall contain 25 lever action 3-position four-pole selector switches of the positive detent type, with LED's, designed for maximum reliability and a life expectancy of over 250,000 operations. Switch positions shall be legibly identified as Program "A", "Off" and Intercom "C". The Program "A" channel shall be identified by a Green guideline, Intercom channel "C" by Orange, and accordance with the "Follow the Color" operating method used in the Director Series System positions. Provide with multi-conductor cable and terminal strips. Furnish a sufficient number of switches for the speakers shown on the drawings plus 10 spare switches.
- 2.2 SPEAKERS - Rauland Model USO188, shall be an 8" permanent magnet cone type having viscous-damped cone and a ceramic magnet weighing 5.0 oz. It shall have a frequency response of at least 65-17,000 Hz, a 10 watt program power-handling capacity and an axial sensitivity of at least 95db at 4 feet with a 1 watt input. Voice coil shall be 3/4" diameter with 8 ohm impedance. Flux density shall be 9,000 gauss. The speaker shall be equipped with Model multi-tap, 1/2, 1 and 2 watt, 25V/70V transformer.
- 2.3 CEILING SPEAKER BACKBOX - Model ACC1101 shall be a round one-piece backbox for flush mounting a standard 8 inch speaker. The enclosure shall be of painted, one-piece 22 gauge drawn steel and shall have applied in its interior a fire retardant resonance damping material. It shall have four perforated steel mounting brackets and

four knockouts for conduit. Dimensions, 9-3/4" diameter with flange diameter of 12-2/16", mounting centers 11-1/4", depth 4-1/16".

- 2.4 CEILING SPEAKER ASSEMBLY - FOR LAY-IN CEILINGS - Rauland BAFKIT 1'x2' tile replacement speaker system with factory installed backbox. Assembly shall include a factory mounted speaker with wired transformer mounted to a 1'x2' sub-plate with a fine perforated grille and T-bar member finished in white powder epoxy. Assembly shall be engineered to replace half of a 2'x2' tile or one quarter of a 2'x4' tile and shall be supported by the ceiling grid system. Speaker shall be Rauland Model USO188x with ACC1101 backbox.
- 2.5 FLUSH CEILING SPEAKER ASSEMBLY - FOR HARD CEILINGS - ACC1406 shall consist of the high quality US0188 loudspeaker complete with a 25V line matching transformer, mounted on a round steel white baffle (ACC1000), furnished with backbox (ACC1101) and speaker support bridge (ACC1104). The frequency response of the speaker shall be 65 to 17,000Hz with a power rating of 8 watts RMS and a sensitivity of 93dB @ 1 meter with 1 watt input.
- 2.6 FLUSH CEILING GRILLE - Speaker ceiling grille shall be Rauland ACC1000 constructed of steel and have a white baked epoxy finish. It shall include matched hardware for mounting a standard 8" speaker. Its overall diameter shall be 12-7/8" with center perforation of 7-5/8".
- 2.7 SURFACE MOUNTED CEILING BAFFLE - Rauland Model ACC1004 constructed of heavy gauge CRS and shall have a white epoxy finish. It shall have a square grille opening with a separate subplate for mounting speaker baffle to the ACC1102 surface backbox. Backbox shall be 12-1/2" square by 4" deep with white epoxy finish.
- 2.8 FLUSH WALL SPEAKER BAFFLE - INTERIOR - Rauland Model ACC1003 constructed of heavy gauge CRS and shall have a white epoxy finish. It shall have a square grille opening with a separate subplate for mounting speaker baffle to the ACC1105 backbox. Its dimensions are 11-1/2" square by 3/16".
- 2.9 TAMPER/MOISTURE RESISTANT SPEAKER SYSTEM - shall consist of the Lowell 8C51MRT25 speaker/transformer, SG8VP tamper resistant grille, P68X recessed backbox (where indicated on drawings), or CB84-SGVP surface backbox (where indicated on drawings). Transformer shall be available for power taps of 0.25, 0.5, 1, 2, and 4 watts. Speaker shall be capable of handling 15 watts RMS power with frequency response of 65Hz-6kHz nominal and a sensitivity of 93dB measured at 1W/1M.
- 2.10 CALL STATION - Lowell Model CS-10, call origination switch shall be mounted on a stainless steel plate and require one momentary depressing of the button to activate a "call-in".
- 2.11 LOW VOLTAGE SURGE SUPPRESSION - Shall be installed on all runs between buildings. Surge suppressors shall operate at 27 volts and shall be as manufactured by Edco, Ditek or Sony.
- 2.12 WIRING & CABLE

- A. All conductors shall be copper. Wire sizes and types shall be as indicated on the drawings.
- B. All wiring and cable installed exposed in a space, concealed inside a wall, concealed above a non-accessible ceiling or underground outside the building shall be installed in conduit. All line voltage wiring shall be installed in conduit. All low voltage wiring installed above accessible ceilings may be installed without conduit by using cable with a jacket which is U.L. listed for installation in a return air plenum.
- C. Plenum rated cable installed in corridors shall be installed in cable hangers which are specified in the Electrical Section. All cables for this system shall be grouped together within the hanger and tied with a cable tie. See detail on the drawings for arrangement with other systems.
- D. Plenum rated cable installed in other spaces where there are no cable hangers shall be tied to the building structure at approximately 6'-0" on center using cable ties.
- E. Plenum cable shall pass through walls by drilling a hole in the wall and installing a conduit with bushings on each end through the wall. Install the cable through the conduit and in fire or smoke rated walls seal the opening around the conduit and the hole in the conduit with a U.L. listed fire rated sealant.
- F. All plenum rated cable used for the Intercommunications system shall have a blue outer jacket. All cable ties shall be plenum rated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Confirm that existing speaker taps are connected so that volume level for both new and existing speakers can be controlled from one master switch at the console. Reconnect the existing speaker taps as required.
- B. The contractor shall guarantee all equipment for a period of one year. The systems shall be demonstrated to the proper authorities and a letter of certification from the authorized supplier stating that the systems are operating as herein specified shall be forwarded to the Architect.

End of Section 16 300