Charleston County School District

DESIGN REQUIREMENTS

For New Construction and
Major Renovations of CCSD Facilities

Rev: 03 - June 2016 Release
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Charleston County School District
Design Requirements for New Construction and Major Renovation
Release #03 - June 2016. Revisions to the text from the previous version are underlined and logged in Appendix B.
PART I: OVERVIEW & REQUIREMENTS BY PROJECT PHASE

1 EXECUTIVE SUMMARY

The CCSD Design Requirements provide direction to design professionals (architects and engineers, “AE”) providing design services for new construction and major renovations for Charleston County School District. The District’s intent is to construct high performance school facilities with superior indoor environmental quality that are energy efficient and cost effective to operate and maintain. These Design Requirements include specific requirements for the Key Stakeholders and Project Team Members that inform Design, Performance, Process, Systems Integration, Construction and Post Occupancy activities.

The Design Requirements provide direction to the AEs for inclusion in contract documents so that Project delivery is consistent and meets CCSD standards. They are intended to improve communication and project planning so that the Capital Programs and Facilities Maintenance & Asset Management deliver the highest quality facilities possible. The Requirements do not supersede any specific contractual agreement for an individual Project between CCSD, the AE, Contractor and/or other participants. Should an AE wish to deviate from these requirements, the AE shall submit a written request to the CCSD Executive Director of Facilities and Asset Management or Designee with appropriate supporting backup documentation. AE shall obtain written approval to proceed with deviation. Conflicts between the Requirements themselves or between the Requirements and the Owner/Architect Agreement during the course of an individual Project shall be brought to the attention of Program Management and then documented in the Owners Project Requirements for that specific Project. Updates to these Design Requirements are at the discretion of the District. Revisions to the text from the previous version are underlined herein and logged in Appendix B: Design Requirements Change Log.

1.1 Guiding Principles

- CCSD strives to provide aesthetically pleasing and structurally functional schools that are comfortable, safe, and meet the needs of students, teachers and staff.
- CCSD strives to build facilities that are cost efficient to construct, operate, and easy to maintain.
- CCSD strives to build sustainable, high performance facilities that attain an Energy Star Score of 80 or higher. CCSD Board of Trustees Policy “FA” states “School projects are designed to be sustainable using LEED (Leadership Energy and Environmental Design) criteria.”
- CCSD expects school facilities to be designed and constructed so that they are able to be operated for a minimum of 50 years prior to major renovation activities.
- CCSD strives to provide consistent and informed direction on building requirements and performance requirements to improve project delivery and reduce lifecycle costs.
- CCSD strives to continually improve performance through incorporating learning into its processes and thus encourages transparency, open communication and thorough documentation among all Stakeholders and Project Team Members.
- CCSD believes clear communication and collaboration among Stakeholders, Project Team Members and other participants in the building/renovation process is critical to a Project’s success and requires all participants to make decisions based on the best outcome for the Project.
1.1 Regulatory Requirements

1.1.1 Codes

The South Carolina School Facilities Planning and Construction Guide (SC P&C Guide) issued by the South Carolina Department of Education Office of School Facilities (OSF), shall provide the minimum requirements for school construction. The SC P&C Guide may be obtained by writing or calling the OSF at 1429 Senate Street, Suite 1114, Columbia SC 29204, (803) 734-4839 FAX (803) 734-4857. It may also be downloaded for free at the following: http://ed.sc.gov/agency/OS/School-Facilities/. In the event there are discrepancies between the SC P&C Guide and this document, Program Management shall be notified for clarification or resolution.

Building design shall comply with the currently adopted building codes, statutes, regulations and referenced standards specified in the SC P&C Guide applicable to the Project and all other applicable codes, statutes and regulations. Adopted building codes in SC may be viewed for free by going to the South Carolina Building Codes council website at: http://www.llr.state.sc.us/pol/bcc/index.asp?file=BCCinfo.htm. The version of the SC P&C Guide used shall be shown on the code analysis drawing for the project.

1.1.2 Building Permits

In accordance with South Carolina Bill 236, Section 6-9-110, local building permits are not required.

1.1.3 Zoning Requirements

All projects shall comply with local zoning ordinances. If it is determined during the course of design that a variance is desired or necessary, the AE shall coordinate the effort to obtain it. The process to obtain rights-of-way and encroachment permits shall also be coordinated by the AE. When Projects are located in historic districts or work is being done on a historic building, the Project shall comply with local, state and federal historic preservation laws and policies.

1.1.4 Project Review

The South Carolina Department of Education, Office of School Facilities (OSF), South Carolina Department of Transportation (SCDOT), South Carolina Educational Television and the South Carolina Department of Health and Environmental Control (DHEC) shall review projects. The State Fire Marshal shall review the life safety aspects of the Project as part of the OSF review. The AE shall review documents as they are developed with local fire code officials who perform the construction phase inspections on behalf of the State. The local fire district shall review and approve the drawings to verify site access for firefighting apparatus.

1.2 Special Inspections


1.3 Performance Requirements

CCSD uses the following criteria to evaluate project performance, including but not limited to:

1. Compliance with the CCSD Design Requirements (this document)
2. Budget and Cost Control
3. Program
4. Function
5. Durability
6. Construction Cost Per Square Foot
7. Facilities Maintenance (FM) & Asset Management (AM) Cost per square foot
8. Energy and Sustainability goals

1.5 Project Participants:

Owner: CCSD
- Deputy for Capital Programs
- Executive Director of Facilities Maintenance and Asset Management

Key Stakeholders: Defined as the Owner (CCSD) and Principals/Senior Management of firms working on the Project (Program Management, AE, Contractors, CxA, etc.)

Project Team Members: Defined as employees of the Owner and firms working on the Project

Program Management: Program Managements - firm(s) hired by the Owner
- AE – Primary AE - Design professionals of record
- Contractor – Prime General Contractor – firm hired by Program Management
- Subcontractors – firms hired by the Contractor
- CxA – Commissioning Authority – firm hired by Owner or Program Management
- SI – Special Inspectors, employees of firms providing Special Inspections
2 PROJECT PHASES

The scope of services for each phase is enumerated in detail in the Agreement between Owner and AE, and as modified in the Supplementary Conditions of Agreement between Owner and AE, issued by the Charleston County School District. This section outlines the process for each phase of design.

2.1 Project Feasibility and Conceptual Design (FCD)

2.1.1 FCD Overview

The stage in which the Owner’s program, financial, and time requirements and the scope of the Project are established and includes, but is not limited to, site selection and expansion feasibility, programming, schematic space planning diagrams, and existing facility surveys. These Design Requirements shall be distributed to Key Stakeholders during the FCD Phase for review. An Owner’s Project Requirements Workshop shall be held with the Key Stakeholders and Project Team Members to review all Owner provided documentation, to define roles and responsibilities of Project Team members and to establish a communication protocol. A Project Specific Owner’s Project Requirements document shall be produced by the Owner or designee that includes Project Specific information on Performance Metrics, Roles and Responsibilities and tracks any deviations to these Design Requirements.

2.1.2 FCD Submittals

a. Project Schedule, Budget and Owner Requirements: Owner and Program Management shall provide facility completion deadline, budget, and Design Requirements to Project Team.

b. Design Phase Schedule and Review Process Plans: The AE shall submit a Schedule and Review Process Plan to Program Management for approval. The schedule shall contain anticipated dates and major milestones for this Phase of the Work, to include deliverable due dates, zoning and Board of Architectural Review meetings and deadlines, interdisciplinary coordination reviews, quality assurance reviews, OSF reviews and approvals, and other agency and AHJ reviews and approvals as identified herein and in the Agreement between the Owner and AE. The Review Process Plan shall outline the steps to be taken by the AE to review for technical accuracy, errors, omissions, discrepancies and constructability. AE shall state which tool (Redi-Check, AIA D200, or equivalent methodology) will be used.

c. Project Feasibility and Conceptual Design Documents (FCD) Submittal is required to obtain the Office of School Facilities’ (OSF) approval allowing the Project to proceed. This submittal focuses on several site considerations outlined in Division 2 of the P&C Guide. SCDOT submittals for applicable schools shall be started in this phase due to the time requirement for SCDOT approval. AE shall perform an evaluation of applicable code issues and coordinate the review effort with code and regulatory officials.

d. Owner’s Project Requirements (OPR) Submittal is required by Owner to document any Project Specific deviations to the Design Requirements, agreement on performance requirements and measurement criteria, identification of project specific team members’ roles/responsibilities/communication, technology parameters (CAD, BIM) and data.

e. Cost Estimate Cost estimates are provided by Program Management. Submittal shall be for all building systems and benchmarked to market rates. During this process long lead time items shall be identified and planned for.
2.1.3 **FCD Review Process**

a. The AE shall submit written responses to all FCD Review Comments within 10 business days of receipt to ensure the comments were understood and shall be correctly incorporated into the Construction Documents.

b. Owner shall review and approve all submittals from FCD Phase including Cost Estimate from Program Management, Design Phase Schedule and Review Plan from AE and Owner’s Project Requirements within 10 business days of receipt.

c. All Key Stakeholders and Project Team Members shall review the OPR and provide written comments back to Owner or Designee.

2.2 **Schematic Design (SD)**

2.2.1 **SD Overview**

The AE shall perform an evaluation of and finalize the scope, form, adjacencies and spatial relationships. Major systems selection shall be finalized and more detailed cost estimates are produced. If the outcome of the analysis and decision making during this phase results in schedule or budget changes, this is documented, reviewed and agreed upon by the Owner and Program Management and documented in the Project Specific OPR. The AE shall produce the Basis of Design (BOD) (based on ASHRAE Guideline 0 and Guideline 1 current edition) and the Owner or Designee shall update the OPR to include any additional deviations from the Design Requirements. AE shall submit a letter stating that the Project has been reviewed and approved by the OSF and SCDOT and other AHJs as necessary. Owner and Program Management shall review and approve the Basis of Design (BOD) and the OPR. Program Management retains services of CxA.

Determine if a Bee Hive will be required in the school and make accommodations for the wall penetration.

2.2.2 **SD Submittals**

**Schematic Design Documents (SD)** shall be submitted as follows:

a. BOD shall be provided by AE. The BOD shall include a written scope that demonstrates the AE’s understanding of the requested facility based on the Design Requirements, and including any variances documented in the OPR. AE shall outline materials and systems from Appendix A such that all Owner preferred manufacturers of products, systems and equipment shall be able to bid the Project using the manufacturer’s customary manufacturing processes.

b. OPR tracked changes from Conceptual Design shall be provided by Owner or Designee.

c. Updated Construction Cost Estimate shall be provided by Program Management.

d. Code analysis reports and drawings as required by OSF shall be provided by the AE.

e. Updated Design Schedule

f. Site Plans: Shall be submitted at appropriate scale, showing:

- the footprint of all structures (existing and new, including those to be demolished) with finished floor elevations
- Proposed finish floor elevations, proposed storm piping routes, and proposed general drainage patterns
• site boundary (showing adjoining roadways with rights-of-way indicated)
• site acreage
• site orientation
• site location map
• all setbacks
• easements and any other site utilization restrictions
• site master plan
• all utilities
• curb cuts
• drives
• walks and parking areas (existing and proposed denoting the separation of buses and cars)
• the building service entrance/area
• proposed storm water detention
• wooded areas with proposed tree save areas indicated
• playfields
• fire hydrants
• Fire Department access around the building perimeter

g. Reasonable efforts shall be made to balance earthwork cut and fill on site. These efforts shall be demonstrated as a cut and fill summary chart on the grading plan. When site conditions or projects require phasing, a phasing plan shall be developed depicting how school and construction activities shall be conducted during the construction process. This shall include, but not limited to, lay down space, construction material storage, construction vehicle parking, student drop-off and pick-up, deliveries of supplies, trash removal, emergency vehicle access to the building equivalent to pre-construction conditions, (re-) location of staff, faculty and visitor parking, (re-) location of portable classrooms, and (re-) location of play areas and equipment.

h. Floor Plans: Provide an overall plan (or plans, if a multi-level scheme is proposed) at a minimum scale of 1/16” =1’-0’ showing overall dimensions, building code analysis information and all program spaces, labeled and with the square footage for each shown. Elementary classrooms shall also show the grade designation. Additionally, indicate all proposed built-in casework, fixtures, equipment, furnishings and floor finishes, noting the items to be provided outside of the construction contract.

i. Roof Plan: Provide an overall Roof Plan indicating the proposed roofing systems, slopes, firewall or other area separations and points of access. Show locations proposed for major mechanical equipment and rooftop classroom spaces.

j. Exterior Elevations: Provide Exterior Elevations at 1/16” =1’-0’ (minimum scale) of at least two major facades, describing all wall systems, other materials and the size and nature of all openings. Show the proposed Floor Elevation (or elevations, for multi-level schemes).

k. Building Sections: Provide at least two (2) major building sections indicating and describing proposed structural elements, proposed distribution of MEP (Mechanical, Electrical and Plumbing) and fire protection systems, ceiling heights, areas of exposed structure, changes in the roof plane, etc., necessary to describe the spatial nature of the program spaces depicted. Indicate all fire separation walls.

l. Structural Plan and Narrative: Provide a conceptual structural framing plan (or plans, for multi-level schemes) indicating the relationship of major members to the program spaces. Also shall provide a thorough narrative describing the proposed structural system(s) including foundations.
m. MEP and Fire Protection Narrative: Provide a thorough narrative of all proposed HVAC (Heating, Ventilation and Air Conditioning), BAS (Building Automation Systems), electrical, plumbing and fire protection systems including distribution, projected loads (block and peak loads), and indicating locations of major equipment. Electrical systems shall include, but not necessarily be limited to, power, BAS, lighting, data, public address / telephone, fire alarm, security, and surveillance. Provide a draft sequence of operations for HVAC systems based on these requirements and the Schedules and other information documented in the Project Specific OPR.

n. Program Space Analysis Chart: Provide a chart comparing all program space requirements indicated in the Project education specifications and those proposed by the schematic plans.

2.2.3 SD Review Process

AE shall submit written responses to all SD Review Comments within 10 business days of receipt to ensure the comments were understood and correctly incorporated into the Design Development Documents.

Third Party Review of HVAC System: The Commissioning Authority (CxA) shall review the design documents for achieving the Owner’s Project Requirements and Basis of Design, and coordination of the systems to be commissioned and shall provide comments to Program Management and the AE for incorporation into the Design Development phase. Submit written report of the third party review to Program Management within 10 business days of receipt of documents.

Note: This submittal corresponds to the Schematic Design package required by the OSF as outlined in P&C Guide. However, the requirements stated above exceed those required by the OSF for an SD submittal. AE shall make submission to the OSF separately as soon as documents meet the requirements of OSF and the approval of Owner. Submission to the OSF shall not occur until after Owner has approved design for submission.

2.3 Design Development Phase (DD)

2.3.1 DD Overview

The primary purpose of Design Development is to define, describe, and coordinate the aspects of the Project so that what remains after approval of the DD submittal is the formal documentation step of Construction Documents. Major issues that could cause delay and restudy during the Construction Documents phase shall be resolved at the conclusion of the DD phase. The AE shall produce a Whole Building Energy Simulation to inform and demonstrate compliance with OPR energy performance metrics and system diversity targets. The AE shall update the BOD to include any changes to the building envelope or mechanical and electrical systems based on the energy model(s) produced with the intention of providing an integrated, energy efficient and sustainable design. AE shall produce detailed drawings and specifications for review and approval.

2.3.2 DD Submittals - Documents

a. Annotated set of SD documents or written report shall indicate that all OSF, Owner and Program Management review comments from all reviews have been addressed and/or incorporated into the Design Development Documents.

b. Specifications using ARCOM MasterSpec, BSD Speclink, and eSpecs or prior approved equal to produce project specifications. Specifications shall be in the CSI
Masterformat 2014 format and numbering system and shall be tailored specifically to the Project.

c. **Updated OPR** Include any additional deviations from the Design Requirements or any changes from Schematic Design Phase based on the Whole Building Energy Simulation and more detailed drawings and specifications produced in the Design Development Phase.

d. **Updated BOD** provided by AE shall include changes based on the Whole Building Energy Simulation.

e. **Updated Construction Cost Estimate** Provided by Program Management

f. **Design Phase Review Checklist** Shall be provided using Owner approved checklists. AE may use their own checklist unless one is specifically provided by Owner.

### 2.3.3 DD Submittals – Drawings

a. **Site Plan**: All elements of the site plan described by the SD documents shall be fixed for this submittal including detailed topography and any earth retaining structures, which may be required. Additionally, a proposed landscape plan, typical site sections and site details shall be provided. All site utility requirements shall be determined for the current construction and the planned future construction, permanent and portable classrooms, and load profile.

b. **Floor Plans**: The overall plan (or plans if multi-level) shall be fixed including dimensions and building code analysis information at 1/16” =1’-0” scale. All program space information from the SD documents shall be included on these plans plus a room numbering system, which is approved by the district and coordinated with the interior signage. Partial floor plans at 1/8” =1’-0” scale shall be developed for each area of the building, constituting the whole. These plans shall show the final configuration of all built-in casework, fixtures, equipment, furnishings, and floor finishes, noting the items to be provided outside of the construction contract. If the program includes new or renovated kitchen facilities, provide an enlarged plan of the kitchen at ¼” = 1’-0” scale with an itemized legend and manufacturer’s literature for each unit of equipment. At the DD submittal, it is expected that floor plans shall be in their final configuration, and shall include all electrical and mechanical spaces. Enlarged plans (1/4’ = 1’-0” minimum) of the primary mechanical room, electrical room and the MTR shall be provided, indicating all required equipment, etc., including associated service clearances.

c. **Roof Plan**: The overall Roof Plan shall be fixed indicating all roofing systems, slopes (including all required crickets), firewall or other area separation penetrations, parapets, gutters and downspouts, roof drains, overflow scuppers/drains, roof top HVAC equipment, plumbing vents, roof hatches, access ladders and walk pads.

d. **Reflected Ceiling Plan(s)**: The overall Ceiling Plans, including reflected ceiling plans at 1/16” =1’-0” (minimum scale) indicating all ceiling materials and systems, changes in the ceiling plane, fire separation walls ceiling mounted fixtures and equipment, and all HVAC, electrical and fire protection fixtures and devices.

e. **Interstitial Plans** (if necessary): These are above ceiling plans and shall provide a plan or details that clearly show all walls and partitions that terminate just above the ceiling and that terminate at the floor deck above or roof deck. This information may be shown on Reflected Ceiling Plans if a separate interstitial plan is not necessary.

f. **Interior Elevations**: Provide interior elevations sufficient to depict the location and number of all wall mounted devices and fixtures including but not limited to: power,
data, and public address / telephone, BAS equipment, HVAC supply and return grills, SMART boards, fire extinguishers, fire alarm and SCETV system devices within the major instructional and main administrative spaces.

g. **Door and Finish Schedules**: Provide door and finish schedules establishing the numbering systems and indicating materials, sizes, and fire ratings.

h. **Exterior Elevations**: Provide Exterior Elevations at 1/16" = 1'-0" (minimum scale) of all facades, fixing the finished floor elevations (s), all materials and the size and nature of all openings. Enlarged partial elevations (1/8" = 1'-0" minimum) shall be provided depicting and describing any special detailing.

i. **Building Sections**: Full building sections shall show all floor levels, mezzanines and major changes in the roof plane and shall show and describe all slab, floor/ceiling and roof/ceiling assemblies. Drawings shall indicate roof slopes, structural members, major mechanical equipment and ductwork, ceiling heights and floor/roof elevations and all fire separation walls.

j. **Wall Sections**: Provide wall sections to describe all typical exterior wall systems including the foundation and slab, windows, any intermediate floor system and the roof at ¾" = 1'-0" indicating the same level of information and detail required for the exterior section(s).

k. **Interior Room Numbers**: Prepare and issue to Program Management for approval a list of room names and room numbers, to allow coordination with schedules and electrical and equipment panel boards.

l. **Structural**: Provide the overall foundation, floor and roof framing plans with the size and location of all major members fixed and indicated. Shall provide detailed sections of typical conditions coordinated with, and at the same scale, as Architectural drawings depicted the same or a similar condition.

m. **MEP (Mechanical, Electrical and Plumbing) and Fire Protection**: Provide overall plans with the size and location of all major equipment and distribution system elements fixed and indicated. Provide enlarged plans (1/8" = 1'-0" minimum) of the major instructional and main administrative spaces indicating the location and number or system devices including power, data, public address / telephone, fire alarm and SCETV. Provide distribution and riser diagrams, equipment schedules and key details sufficient to describe the full scope of every building system. Provide final Sequence of Operations for HVAC system. The systems to be addressed include, but are not limited to, HVAC / BAS, plumbing and fire protection, power, lighting, data, public address / telephone, fire alarm, security, surveillance and SCETV. All utility requirements shall be determined and loads indicated. Short Circuit and Ground Fault Analysis of the power distribution system shall be provided with this submittal.

n. **Updated Program Analysis Space Chart**: Provide an updated chart comparing all program space requirements indicated in the Education Specifications (if provided) and/or those proposed by the Design Development plans.

o. **Sustainability**: Provide updated LEED scorecard (LEED 2009) V3 and write a brief statement outlining any changes in the LEED principles that will be applied from SD.

### 2.3.4 DD Review Process

a. The AE shall submit written responses to all DD Review Comments within 10 business days of receipt to ensure the comments were understood and shall be correctly incorporated into the Construction Documents.
b. Third Party Review of HVAC System: The CxA shall review the design documents for achieving the Owner’s Project Requirements and Basis of Design, and coordination of commissioned systems and provide comments to Program Management and the AE for incorporation into the 95% Construction Documents within 10 business days of receipt.

c. This submittal corresponds to the Design Development package required by the OSF P&C Guide. However, the requirements stated above exceed those required by the OSF for DD. The AE shall make submission to the OSF separately as soon as documents meet the requirements of OSF. OWNER’s review of the submittal shall conclude with a special session/meeting with the AE and Program Management to discuss the design and detailing of all aspects of the building envelope within 10 business days of receipt.

d. Program Management will schedule a Design Review Workshop with AE, Owner or Designee and PM to receive final comments. AE shall provide written responses to all comments received at the Design Development Workshop within 10 business days of workshop. All parties shall be advised that no further functional input may be accommodated without adversely impacting project timelines and budgets.

2.4 Construction Documents Phase (CD 95%)

2.4.1 95% CD Submittals shall include:

a. Updated OPR, BOD, and whole building energy simulation shall be provided if there are any changes from DD.

b. Updated Construction Cost Estimate provided by Program Management.

c. Construction Phase Review Process Checklist provided by Program Management. AE may use their own checklist unless one is specifically provided by Owner.

d. Annotated set of DD documents or written report indicating that all OSF, Owner and Program Management review comments from DD review have been addressed and/or incorporated into the Construction Documents.

e. Provide 95% Complete Project Specifications.

f. Provide updated LEED scorecard (LEED 2009) and write a brief statement outlining any changes in the LEED principles that will be applied from DD.

2.4.2 95% Construction Drawings shall include:

a. Drawing orientation and scales shall match the Architectural Drawings with the exception of Civil and Landscaping Design.

b. Civil: All aspects of the site development work shall be fully developed and detailed to include, but not limited to, grading; drainage structures and associated piping; detention ponds; any earth retaining structures; all drives; parking; curbing and walkways; site access and SCDOT requirements; acceleration and deceleration lanes; all structures (new and existing, including those to be demolished)
dimensionally located as appropriate; all utility connections; playing fields;
permanently installed physical education equipment; fencing; tree save areas; new
landscaping; erosion control and a complete project phasing plan (for work to be
performed at existing campuses).

c. **Architectural:** All aspects of the work shall be fully developed and detailed for this
submittal and shall include, but not necessarily limited to, fully dimensioned plans
with room names and numbers, door numbers, finishes indicated, and coordinated
with structural and all other building systems, complete exterior elevations, complete
building sections and all major wall sections, a roof plan indicating slopes and the
location of all equipment, penetrations and access points, reflected ceiling plans
indicating all materials, fixtures, devices and changes in plane, interior elevations
showing fixture and building system device locations, door schedule including
hardware sets, door/frame elevations and typical frame details, window schedule with
elevations and typical details, finish schedule, and full specification sections for all
required work.

d. **Structural:** Provide all foundation and framing plans, fully dimensioned and
coordinated with the Civil, Architectural and MEP & FP disciplines including, but not
necessarily limited to, the size and spacing of all framing member, slab/floor
elevations and bearing heights, slab depressions, openings for ductwork, etc.,
section details at typical and special conditions, and reinforcing schedule.

e. **MEP & FP:** Shall be complete and fully coordinated with all disciplines (Civil, AE, and
Structural, etc.) showing the location of all units of equipment and their distribution
systems. Documents shall also include completed riser diagrams, system details,
fixture and equipment schedules, and full specification sections for all required work.
Provide complete control diagrams and sequence of operations with initial operating
schedules, occupied set points, unoccupied set points, interfaces to internal
equipment controls, and alerts and notifications.

f. **Kitchen:** Where a new or renovated kitchen is part of the Project, shall provide a
fully developed and dimensioned enlarged plan (1/4" = 1'-0") with a complete
equipment schedule, locating all utility connections. Additionally, provide full
specification sections for all required work.

### 2.4.3 95% CD Review Process

a. Submit a written response to all 95% CD Review Comments within 30 days of receipt
to ensure the comments were understood and shall be correctly incorporated into the
Bid Documents.

b. CxA to back-check comments made during the DD phase and submit a final
commissioning review document. CxA may also check final cost estimates.

c. Once the 95% CD comments are incorporated and all issues resolved, the Architect
publishes the Bid Documents (100% CD Documents)

d. 100% CD Documents to be submitted to OSF for Approval

### 2.5 Bid Phase

The AE shall assist Program Management in preparation of information for bidders, the bidding
process, preparation of proposed contract forms, and Conditions of the Contract covering Project
Stakeholder roles and responsibilities during construction.

#### 2.5.1 Bid Phase Activities

To be determined and prescribed by Program Management.
2.6 Construction Contract Administration (CCA) and Construction Phase

The AE and Program Management shall ensure that the contractor roles and responsibilities indicated below are included as requirements in bidding and construction contract documents.

2.6.1 Overview

The Contractor joins the existing Project Team and Owner/AE/Contractor Project Meetings begin at the pre-construction meeting shall be held by the Owner and Program Management with the Project Team Members in order to engage the team and to clearly define roles and responsibilities, establish ground rules for communication and problem solving during the Construction Phase.

The AE’s role during the CCA and Construction phase shall be in accordance with their contract, and in general, the AEs act as the Owner’s Representative to determine whether the Contractor is constructing the Project in general conformity with the overall design concept and intent. The AE observes the work, reviews progress reports, submittals, and certifies the applications for payment, attends Project Team Meetings, prepares and recommends contract modifications and inspects the Project for Substantial and Final Completion.

A Pre-Final inspection shall be held after all systems are in place and in operation. The Program Management requires the Contractor and sub-contractors to attend this inspection including, but not limited to, the HVAC, Plumbing, Electrical, TAB, Building Automation System and Kitchen sub-contractors.

2.6.2 Construction/CCA Submittals

a. Contract Documents: AE updates the Bid Documents with any changes occurring during the Bid Phase and submits the final 100% Construction Documents prior to work commencing.

b. Construction Phase Schedule: The Contractor submits a Construction Phase Project Schedule to include major milestones and dates for Construction Phase Submittals and Construction Phase Activities to bring the Project to Substantial completion on the agreed upon timeline and within the agreed upon budget. Schedule shall include the necessary time allocation for final testing and commissioning of the building envelope and all energy using systems so that all work and testing is complete prior to substantial completion inspection.

c. Construction Phase Review Process: The Construction Phase Review Process provides a process for RFI distribution, review and approvals, a change order process, a financial review process, interdisciplinary coordination reviews, quality assurance reviews, OSF reviews and approvals, and other agency and AHJ reviews and approvals as identified herein and in the Agreement between the Owner and Contractor.

d. Contractor submits a checklist of all submittal documents necessary for Close Out including, but not limited to, product bonds and/or warranties, spare parts, shop drawings, Owner training and demonstrations, maintenance supplies (attic stock), equipment manuals and certifications required by the Specifications.

e. Meeting minutes shall be kept from Project Team Meetings including the Kick-off meeting establishing roles and responsibilities, communication Protocol and problem solving methodology.

f. RFIs: The Contractor shall be responsible for keeping their own tracking log of Requests for Information (RFIs). The Contractor shall review RFIs submitted by Subcontractors for accuracy and correctness prior to submitting to the AE for response. If an AE response to an RFI has a cost or schedule impact, the Contractor
shall notify the Owner and Project Team immediately and use the appropriate channels to get approval to proceed with the work. The Contractor shall keep one set of Record Documents onsite which is continuously updated with responses to RFIs.

g. **Change Orders:** To be determined by Program Management and Owner.

h. **Payment Requisitions:** To be determined by Program Management and Owner.

i. **IBC Special Inspection Reports:** To be determined by Program Management

j. **Checklist of Permits:** Contractor shall issue a checklist of required permits for the Project, including agency, permit description, contact person, date requested and date acquired.

k. **Utility Connection Approval:** AE shall coordinate with utility providers and provide each utility with all required documentation and approvals so that utilities may provide temporary (if necessary) and permanent utility connections to the Project.

2.6.3 **Construction Phase Review Process**

2.6.4 **Construction Project Management**

2.6.5 **Construction Contract Administration**

2.6.6 **Test and Balance (TAB) – See General Division 01**

2.6.7 **Commissioning (Cx) – See General Division 01**

2.7 **Project Close-Out**

2.7.1 **Close-Out Overview**

During the Closeout Phase the Contractor shall be responsible for developing the Punch List, coordinating the Training of O&M personnel by the Equipment Manufacturers, providing the CxA with Operation and Maintenance documentation including Warranties, reviewing the As-Built documentation with the Owner and obtaining the Certificate of Occupancy. The CxA shall be responsible for compiling the O&M manual and verifying that the O&M personnel received the appropriate training to be able to operate and maintain the building in the manner it is intended. The Contractor, Program Management and Owner shall be responsible for reviewing the Punch List and deciding which items the Contractor is responsible for completing before Final Completion is obtained. A Final inspection shall be held with Owner, AEs, all Contractors and Subcontractors to demonstrate to Owner that all systems in the building are operating as designed and intended. For any system not operating as designed, the warranty shall not commence until system is certified by the Commissioning Authority and AEs.

2.7.2 **Close-Out Submittals:**

a. Functional Performance Test documentation shall be submitted by the CxA

b. Final Commissioning Report shall be submitted by the CxA

c. **As Built Documents:** As-built drawings shall be submitted by the Contractor to AE. AE shall obtain marked up prints from the Contractor to produce and deliver electronic as built in both AutoCAD and PDF formats.

d. An electronic copy of all approved shop drawings.
e. Contractor shall submit all forms required by OSF including, but not limited to, Form 666, Applications for Approval of Final Construction Documents to OSF.

f. Owner shall provide a list of Owner Furnished/Owner Installed (OFOI), Owner Furnished/Contractor Installed (OFCI), an Interior Signage schedule of previously approved room names and room numbers.

g. All Contractors and subcontractors through the Contractor shall submit a list of required equipment/system submittals to the CxA in accordance with the requirements of Division 01. The CxA shall identify submittals to be submitted to the CxA concurrent with submission to the AE for review.

h. All Contractors and subcontractors through the Contractor shall submit required preventative maintenance equipment data sheets to the CxA in accordance with the requirements of Division 01.

i. All Contractors and subcontractors shall submit O&M data for systems and equipment being commissioned under this specification, as specified elsewhere and as applicable in accordance with ASHRAE Guideline 4-2008 through the Program Management. O&M data shall be submitted in accordance with the requirements of Division 01.

j. All Contractors and subcontractors via the Program Management shall deliver the required extra materials not later than 5 weeks prior to the start of the FPT phase.

- Preventative Maintenance Equipment Forms
- Extra Materials Delivery Form
- Corrective Action Report Form
- Operations & Maintenance Training Form
- Sewer, water, and storm drains require inspection and certification.

2.7.3 Training

See Division 01.

2.8 Post Construction

2.8.1 Inspections

Two post construction inspections shall be held by Program Management with the AE, the Contractors, CxA and Owner to assure that the building is continuing to operate in accordance with the plans and specifications and that there are no unresolved issues with operation of the facility. These inspections shall address building envelope and all energy using systems including, but not limited to, Plumbing, HVAC and electrical work.

The first post construction inspection shall take place 6 months after final construction inspection. The second post construction inspection shall be held 1 month prior to expiration of the 1-year warranty period. All discrepancies and deficiencies discovered during these inspections that relate to defective materials or defective workmanship shall be corrected by the Contractor at no additional cost to Owner.

2.8.2 Training

See Division 01.
PART II: DIVISION & DISCIPLINE SPECIFIC REQUIREMENTS

The requirements stated in the following Divisions shall be included in the contract documents unless otherwise approved by Owner. The AE shall review and coordinate all Divisions prior to completion of DDs to avoid duplications, contradictions, errors, and omissions. Questions, comments, and/or concerns regarding any of these requirements should be addressed in writing to the Program Management for resolution or clarification with the Owner.

Owner will update these Divisions on a regular schedule set and communicated by Owner. AE will be expected to comply with all requirements that are current at the commencement of their specific Project.

DIVISION 01 - GENERAL REQUIREMENTS

ENERGY AND SUSTAINABILITY REQUIREMENTS

New Construction projects shall be designed to LEED 2009 v3 standards to meet LEED certified level. A draft LEED scorecard shall be produced in the FCD phase, updated throughout the project with the final scorecard included in project closeout documentation.

Project performance will be evaluated on the following metrics as defined below and on the output of the Whole Building Energy Simulation:

- Energy Use Intensity (EUI): Energy Use per Square Foot
- Energy Star Score: Minimum Energy Star Score 80 (after one year in operation)
- Exceed IECC 2009/ASHRAE 90.1 2007 by ten percent or greater
- Water Use: Gallons Per Square Foot
- Indoor Environmental Quality (IEQ)
- Annual Carbon Emissions
- Life Cycle Cost

Whole Building Energy Simulation Shall be provided by a P.E., AEE BESA, or ASHRAE BEMP using a computer aided load design software to demonstrate compliance with Energy Metrics above:

- Acceptable software programs shall comply with ASHRAE Standard 140 -- Standard Method of Test for the Evaluation of Computer Based Energy Analysis Computer Programs, current edition, limited to Autodesk Revit, IES Virtual Environment, Trane TRACE, Carrier HAP, eQuest, Energy Plus, or Open Studio. (If another software tool is proposed, Engineer shall submit in writing for Program Management approval, detail how the tool will be used, and methodology to be applied and program input and output summaries.)
- Simulation shall be for 8760 hours per year for both design and energy consumption of the operations of the HVAC and BAS.
- Load designs shall produce design day calculations as well as simulated operating load profiles and energy consumption profiles for a weekday, weekend, and holiday for both occupied and unoccupied hours.
- Output reports shall show individual space and terminal HVAC equipment peak design loads, as well as the central system/building peak load design sizes. The simulation shall use set points and scheduled occupied and unoccupied times for
the various spaces and space use types found in the schools (classroom, kitchen, cafeteria, media centers, gymnasiums, administration areas, etc.) as stated in the Design Requirements or as documented in the Project Specific OPR. Space use and occupancy schedules shall be as prescribed in the Appendices to ASHRAE 90.1 User’s Manual, Table G-M -School Occupancy and shall be modified as required for any specific function at the school not covered in the ASHRAE User’s Manual.

- Diversity: All HVAC systems having central plant equipment, such as chilled water cooling, hot water heating, variable air volume systems, water source heat pump system, cooling towers, boilers, pumps, piping, and associated equipment shall be sized using industry prescribed diversity factors or actual central system/building design loads as provided by the whole building energy simulation described above with any appropriate safety factors. When diversity is not provided in the central system equipment, copies of the load design software input and output reports along with a written justification accompanied with appropriate energy and economic analysis to justify not providing diversity in the central equipment sizing shall be provided to Program Management for approval.

- U-value: Include building envelope U-value assumptions and calculations.

- Duct system calculations: Include static pressure calculations used for fan sizing and the basis of design (software, spreadsheet, manual “Ductulator”, etc.)

- Hydronic system calculation: Include friction loss and pump sizing calculations and the basis of design (software, spreadsheet, “System Syzer”, etc.)

- Mass flow calculations: Include building and zone pressurization relationships. Pressurization calculations shall demonstrate areas that are under slight positive pressure, negative pressure or neutral pressure as appropriate for the area of the building being served. Buildings shall be maintained at a slight positive or near neutral pressure relationship with respect to the outside.

- Lighting and Power: Include lighting calculations for all exit signs, building exterior, grounds/site and parking, and all building power distribution systems based on actual fixtures and equipment specified.

- Fenestration: AE shall limit the total amount of fenestration such that it is in compliance with Energy Code or LEED Certification guidance.

- Demonstrate energy conservation by reducing lighting power density; eliminate light trespass at site boundaries as prescribed in the current version of the IESNA Lighting Handbook.

- Acoustics: Design, calculation and measurement shall demonstrate compliance with the HVAC background noise level requirements of not more than 45 dBA for major renovations. New Construction shall demonstrate compliance with the current edition of ANSI/ASA S12.60 – “Acoustical Performance Criteria, Design Requirements and Guidelines for Schools.”

**EXTERIOR MOCK UP REQUIREMENTS**

**Exterior Walls**

Provide a freestanding mockup of a typical exterior wall construction and include a detailed description of the mockup components. Depending on the school design, interior mock-ups may be required. The mockup shall be a minimum 4 ft. long by 4 ft. high and be a composite representation of the actual design for the purpose of evaluating the quality, workmanship and establishing the color and pattern. The mockup shall include the following:

Charleston County School District
Design Requirements for New Construction and Major Renovation
Release #03 - June 2016. Revisions to the text from the previous version are underlined and logged in Appendix B.
Intersection of the various wall components
A control joint showing sealant colors
Window openings, seal, etc.

**Sprayed On Fire-Resistive Materials**

Require to have mock ups for sprayed on fire-resistive materials at least 100 sq. ft. of surface shall be done for each UL test. Check for density and bond strength.

**STORAGE AND HANDLING OF MATERIALS**

- All materials shall be stored on site in accordance with manufacturers’ recommendation and in such a way that no warranties are voided.

**COMMISSIONING REQUIREMENTS**

All new Owner construction and major renovations require Commissioning (Cx) of the building’s energy using systems, the building envelope and other assemblies and shall follow the format and content recommendations of ASHRAE Standard 202 - 2013. ASHRAE defines Cx as “a quality-focused process for enhancing the delivery of a project that requires verifying and documenting that all of the commissioned systems and assemblies are planned, designed, installed, tested, operated and maintained to meet the Owner’s Project Requirements. The Commissioning Authority (CxA) shall be retained by the Owner or Program Management and shall inform Key Stakeholders and Project Team members of Owner requirements. The Owner or Designee shall facilitate a workshop during the Feasibility/Conceptual Design Phase to document Project Specific requirements including any deviations to these Design Requirements. The Owner or Designee is required to update the Project Specific OPR over the course of the entire Project.

The CxA Requirements are: (If CxA is not under contract for any of these Requirements, Owner shall complete or designate responsible party)

- CxA shall review the OPR and Basis of Design (BOD) and the Design Submittals during all Phases of the Project Design to ensure compliance with the Design Requirements and the Project Specific OPR. Submit written report of the third party review to Program Management within 10 business days of receipt of documents.
- CxA shall write the initial Cx Plan and provide milestones to the Contractor that shall be included in Construction Phase schedules. CxA shall update the Cx Plan over the course of the Project.
- CxA shall review the Construction Submittals of all systems and materials related to the Cx process to ensure compliance with the Design Requirements and the Project Specific OPR.
- CxA shall conduct periodic site visits and send site visit reports to the Project Team that includes any Cx-related issues found while onsite. The CxA shall track Cx issues on a log to document when the issues were identified, proposed resolutions, final resolutions and when the issue was closed and verified by the CxA.
- CxA shall witness a sample of airside and waterside (if applicable) Test and Balance (TAB) procedures and verify that systems are functioning as the design intended, and if not, document issues and resolution procedures.
- CxA shall review the Operations & Maintenance (O&M) Manuals during Construction / Post Occupancy to verify compliance with the Design Requirements and the Project Specific OPR.
• CxA shall obtain required O&M Manuals, warranties, training materials, etc. from the Contractor. CxA shall produce the Systems and Assemblies Manual following ASHRAE Guideline 1.4-2014 “Procedures for Preparing Facilities Systems Manuals.

• CxA shall witness a sample of the Owner Facility Management Training and verify that all training requirements are completed by Contractor.

• CxA shall participate in Program Management/Contractor’s pre-final and Final Occupancy Inspections.

• CxA shall submit the Final Cx Report within 30 calendar days of Final Occupancy Inspection.

• CxA shall conduct a 10-month Post Occupancy Inspection/warranty review of facility systems and assemblies. This site visit shall be scheduled before the warranty phase has ended. Final Cx Report shall be updated to reflect results of 10 month Post Occupancy Inspection.

The following Systems and Assemblies Required to Be Commissioned:

- HVAC
- Boilers and Domestic Hot Water Systems
- Building Automation System
- Lighting Systems
- Electrical Distribution
- Security Systems
- Renewable Energy Systems
- Emergency Generator

Specify the following Cx Requirements by Project Phase

Feasibility and Conceptual Design Phase (FCD)

During the FCD phase, the Program Management shall:

• Distribute Design Requirements to Key Stakeholders and Project Team Members
• Facilitate Owner’s Project Requirements Workshop
• Develop the Project Specific Owner’s Project Requirements document to include:
  - Project Description
  - Team Members (contact info., roles and responsibilities)
  - Project Schedule and Scope
  - Occupancy Schedules
  - Deviations to Design Requirements and/or Education Specifications
  - Draft LEED 2009 v3 Scorecard for Certification

During the FCD phase, the CxA (if retained) shall:

• Develop Initial Cx Plan which shall include preliminary schedule, process, testing procedures, individual responsibilities, documentation requirements, communication and reporting protocols, training and evaluation procedures.
Schematic Design: (SD)

875

• Review BOD to verify compliance with Design Requirements and OPR.
876

• Review Design Submittals to verify compliance with Requirements, BOD and OPR. Create a Design Review log to track comments related to Cx. Submit the log to the Project Team to review and for their response.
877

• If non-compliance occurs, communicate impact on Cx Schedule, Training needs or other Owner’s Requirements and Update OPR and Cx Plan accordingly.
878

• Develop Cx Requirements for Design Development Documents
879

Design Development: (DD)
880

• Review BOD to verify compliance with Design Requirements and OPR.
881

• Review Design Submittals to verify compliance with Guidelines, BOD and OPR. Update the Design Review log to track comments related to Cx. Submit the log to the Project Team for their responses.
882

• If non-compliance occurs, communicate impact on Cx Schedule, Training needs or other Owner’s Requirements and Update OPR and Cx Plan accordingly.
883

• Develop Cx Requirements for Construction Documents
884

95% Construction Documents (95% CD)
885

• Back-check comments made during the DD phase and submit a final commissioning review document. CxA may also check final cost estimates.
886

Construction
887

• Participate in the Contractor’s Pre-Construction meeting with Contractors.
888

• Conduct a Pre-Commissioning Meeting
889

• Update Cx Plan
890

• Provide Cx-related milestones to the Contractor to incorporate into the Project Schedule
891

• Review Construction Submittals related to Cx
892

Pre-functional Process
893

• Create Pre-Functional Tests checklists for Contractor completion
894

• Witness a sample of Contractor Start-up of Systems
895

• Review Pre-Functional Test checklists completed by Contractors
896

Functional Testing
897

• Verify and Witness TAB of HVAC
898

• Review BAS Sequence of Operations
899

• Verify BAS functionality Point to Point
900

• Verify Network and Communication
901

• Review BAS Sequence of Operations documentation and verify it is correct
902

• Create Functional Performance Tests
903

• Witness completion of Functional Performance Tests conducted by Contractors
904
• Issue and distribute Status Reports and Issues Log

• Witness Owner Training

• Review O&M Manuals and Owner Training information and create Systems Manual

**Post Occupancy**

• Review Contractor Callback issues provided by Program Management between Final Inspection and second Post Construction Inspection (one month prior to warranty expiration).

• Participate in Post Construction Inspections / Warranty Reviews

• Update Issues Log

• Update Final Cx Report

**TRAINING REQUIREMENTS**

Specify the following training requirements for Owner Personnel:

• The time required for training shall be specified as appropriate for the system or component in the contract documents. Training shall be coordinated by Program Management and scheduled 30 days in advance with Owner prior to substantial completion. Similarly, if systems require sending Owner personnel to the factory, this shall be coordinated 30 days in advance with Program Management prior to project substantial completion and be included in contract documents. Program Management shall be responsible for the sequencing of training deliverables and schedules so that all training requirements are met prior to substantial completion and within the required timeframes.

• At a minimum, training is required on the following:
  - HVAC
  - Domestic Hot Water
  - Lighting Controls
  - Emergency Power and Generators
  - BAS system and controls
  - Fire Alarm
  - Automatic Fire Protection Systems
  - Security
  - Communications/Technology
  - Marquee Signage and Sound Systems
  - Door Hardware
  - Envelope
  - Utility feeds

• Owner personnel shall receive comprehensive training from manufacturer’s factory authorized/certified personnel using formal written curriculums and classroom instruction on the proper use, operation and maintenance of all systems 90 – 120 days prior to Substantial Completion.

• Owner personnel shall receive comprehensive Functional Hands-on Field Training in the proper use, operation and maintenance of all systems 14 - 30 days prior to Substantial Completion.

• Contractor shall be required to compile all the necessary information and materials for training Owner personnel and others as directed.
• A factory-authorized service representative shall demonstrate and train Owner’s maintenance personnel in the proper use, operation, and maintenance of elevators. Make a final check of elevator operation with Owner’s personnel present and just prior to the date of Substantial Completion.

• A training session on TVSS and SPDs shall be conducted by a manufacturer’s qualified representative and shall consist of instruction on operation of the assembly, circuit breakers, fused switches, and major components within the assembly. The session shall be scheduled at least 30 days in advance and prior to substantial completion.

• Owner Food Service Personnel shall receive comprehensive Functional Hands On Field Training in the proper use, operation and maintenance of all food service equipment within 10 business days following equipment start-up. Training shall consist of 2 separate sessions, with the second occurring no more than 30 days following occupancy.

• The CxA shall review the Contractors submittal of required Training Documentation and Operations and Maintenance Manual, and organize it into the Systems Manual. The Systems Manual shall be in electronic PDF format with a table of contents that includes links to each section. The Systems Manual shall be produced 30 to 40 days prior to substantial completion to be available for Owner personnel for classroom instruction.

• The Owner Training sessions shall be videotaped by the Contractor and provided to Owner at completion of the training sessions.

**Contractor shall furnish the following materials in the O&M Manuals:**

• Provide a copy of the training plan, including schedule, syllabus, and agenda.

• Provide a detailed description of each system and its components, wiring and control diagrams, installation procedures, and control sequences for starting equipment, operating equipment in all modes and shutting equipment down.

• Provide a written schedule in electronic PDF and a Microsoft Excel spreadsheet of all equipment manufacturers, including model numbers and serial numbers.

• Provide all required emergency instructions and safety precautions.

• Provide maintenance information for each piece of equipment to include overhaul instructions and lubricating schedule including type, grade, temperature, and frequency range.

• Provide specification sheets for each piece of equipment and control.

• Compile and provide all training Materials provided by the manufacturers.

• Provide scanned PDF copies of record drawings, shop drawings and As-Builts.

• Provide product information identifying performance curves, rating data, features, and options on all installed equipment.

• Provide copies of approved certifications and laboratory test reports.

• Provide copies of warranties.

• Provide test procedures including the impact of testing and operation of fire and life safety systems.

• Provide contact information for each Contractor who installed equipment.

• Provide contact information for local manufacturer representative for each piece of equipment.
• Provide a parts list, including source of supply and recommended spare parts.

• Provide a videotape of manufacturer’s or vendor’s on-site training of Owner Personnel.

• Provide a schedule of Uninterruptible power supplies and Emergency Power Generation, including a list of equipment and design kW load on each.

WARRANTIES AND MAINTENANCE AGREEMENTS

General Requirements

• Warranties shall include all material and labor cost for corrective action or replacement. All warranties shall commence from the date of Substantial Completion, not from equipment startup date.

• Program Management shall respond within 24 hours after a complaint is issued via Owner work order system. After 24 hours, Owner shall have the right to repair and back charge Program Management.

• AE shall require, as a bid alternate, a two (2) year Contractor’s warranty for all Work from the date of substantial completion to be provided by the Contractor.

ONE (1) YEAR WARRANTY

• All Work shall be fully warranted for one year from the date of substantial completion by the Contractor.

Two (2) YEAR WARRANTY

• Sheet waterproofing, includes manufacturer’s standard warranty plus a 2-year labor warranty from installer.

• Outside air units are to have 2 years Parts & Labor.

Five (5) YEAR WARRANTY

• Wood Doors

• HVAC compressors, coils, piping, refrigeration circuits, manufacturer’s controls, and accessories.

• LED Marquee sign including: LED Message Center, ID cabinet, structure and installation.

• Termite Control

• Transient Voltage Surge Suppression (TVSS)

• Surge Protection Devices (SPDs)

• All coastal protective coatings on HVAC equipment, condenser coils and coils exposed to 100% of outdoor air.

Ten (10) YEAR WARRANTY

• Glazing Fiberglass Reinforced Plastic (FRP) Door Systems

• Operable Partitions

• Fluid-Applied Roofing

• Pre-Engineered Walkway to include metal failure, fastener failure, and finish failure.

Twenty (20) YEAR WARRANTY

• All aluminum window finishes shall carry a 20-year coastal finish warranty (i.e. warranty shall permit product use in coastal environments)
• All aluminum storefront and curtain wall finishes shall carry a 20-year coastal finish warranty (i.e. warranty shall permit product use in coastal environments)

• All fixed and telescoping audience seating shall include replacement structural steel components, nets, bolts, axles and wheels as necessary to maintain the integrity of the original installation.

**20 YEAR NO DOLLAR LIMIT “SYSTEM” WARRANTY**

• Modified Bitumen Roofing

• Built-Up Roofing

• A complete roofing system warranty to include insulation, cover boards, fasteners, all membrane components, all base and counter flashing components, walk pads, and all roofing accessories. Warranty shall remain intact and warrant roof systems performance up to and including 74 mph winds.

• Sheet Metal Roofing for entire roofing system which shall include coverage for weather-tightness failure, finish cracking, peeling, color fading, flashing failure, and/or trim failure

**30 YEAR WARRANTY**

• Asphalt Shingle Roofing
DIVISION 02 – EXISTING CONDITIONS

Owner requires an environmental consultant to coordinate on all types of demolition and waste disposal if any study indicates the presence of hazardous materials as defined by OSHA or other regulatory bodies.

SELECTIVE DEMOLITION

Require the following for Selective Demolition:

Require Selective Demolition (removal of a portion of an existing structure and selected site elements) when buildings are to remain.

- The extent of demolition shall be clearly shown on the drawings for each discipline affected.
- Unless otherwise noted, demolished materials shall become Contractor’s property.
- The Contractor shall prepare and implement a Waste Management Plan on all projects.
- The Contractor shall document (photographs, videotapes) the extent of demolition, pre-demolition if Program Management requires this for the Project.
- The Contractor shall notify Owner 7 days prior to start of demolition if Owner indicates that they will occupy portions of the facility adjacent to selective demolition.
- The Contractor shall provide a list of items to be removed or salvaged if items cannot be removed by Owner prior to demolition.
- The Contractor shall recycle a minimum of 50% of all debris taken from site during demolition.
- The Contractor shall legally recycle demolished materials or if they cannot be recycled economically, Contractor shall dispose of them off-site in a certified landfill.
- The Contractor shall not burn any demolished materials. Landfill deposit slips from recycling waste hauler(s) and certified landfills shall be maintained as evidence of proper disposal.
- The Contractor shall remove all hazardous material and shall legally handle, transport, and provide chain of custody documentation for all hazardous materials removed from site and deposit them in a SCDHEC specially certified landfill.

COMPLETE DEMOLITION

Require the following for Complete Demolition:

Complete Demolition is the total removal of an existing structure, to include removal of known below-grade construction and existing utilities shown on the site survey. In some instances, utilities may be abandoned in place when approved by Owner. Owner or Designee shall notify Contractor in writing when complete Demolition can begin. After notification, any remaining contents (furnishings, equipment, etc.) shall become the Contractor’s property.

- When Contractor is asked to remove and salvage any items, for example historic items, that these items be labeled as “remove and salvage”.
- Contractor shall accomplish building demolition only by mechanical or hand methods; explosives or imploding are not allowed.
- Contractor shall submit an environmental protection plan addressing environmental protection, dust control, and noise control measures.
• Contractor shall coordinate with District’s environmental consultant studies indicate the presence of hazardous materials.

• Site restoration as a result of demolition activities shall be addressed in the specifications.
DIVISION 03 – CONCRETE

GENERAL REQUIREMENTS:

• AE shall specify pre-placement meetings for all concrete work.
• AE shall require Contractor to mix, finish and cure concrete flooring and subflooring in accordance with manufacturer’s written installation instructions for each type and location of flooring shown in the finish schedules.
• Require initial floating to form uniform and open textured surface plan, free of lumps, humps, divots and hollows.
• Require Contractor to finish and measure surface so gap at any point between concrete surface and unleveled freestanding 10-foot long straightedge resting on two high spots and placed anywhere on surface shall not exceed 3/16 inch.

CAST-IN-PLACE CONCRETE

• Coordinate vapor retarders and perimeter slab insulation requirements with Division 07 Sections.
• Color additives and specialty toppings shall not be specified unless approved by Owner.
• Permanent sealers, such as epoxy coatings, shall be specified in Division 9.

PLANT PRECAST STRUCTURAL CONCRETE

• Tilt-up precast panels that are site precast and finished on site shall not be used.

PLANT-PRECAST ARCHITECTURAL CONCRETE

• Insulated precast Architectural panels, with thin brick facings, or stone facings may be used for portions of a building or entire building envelopes.
• Feasibility studies on their use shall include cost, structural implications, and effect on construction schedule.
• Precast concrete panels shall not be left exposed as an interior finish in any application.

Specify the following Design Requirements for Precast Concrete Panels:

1. General:
   o Wall Panel Size – standard design dimension shall be 12'-0", 12'-8", or 13'-4" wide x 32' to 45' tall x 7.5" to 9.5" thick depending on specific loading conditions and module Architectural details.
   o Panel Ratio – maximum economy is reached when no more than 10% of total panel pieces vary from the nominal standard width. Non-standard panels shall be utilized at building corners to make up dimensional differences.
   o Wall Panelization – economies are maximized when wall panel size and detail is repetitious.
   o Joints – standard joint width is ¾” for precast wall panels. Plan for tolerances accordingly in exterior Architectural details and window system compatibility. See current edition of Precast/Pre-stressed Concrete Institute (PCI) Handbook.

2. Architectural Details
Reveals – standard reveal width is 2” at the mouth, 3/8” deep; other reveal patterns shall occur in 2” increments and no deeper than 3/8” to protect reinforcing cover. Do not use elaborate patterns. Budget allotment is the equivalent linear footage of 6 horizontal reveals per panel. Reveals used to surround brick areas count against this allotment.

Colors – select from 3 standard concrete mix designs (Gray Rock Gray – gray cement with granite aggregate, Buff – antique white cement with white aggregate, Modified Buff – antique white cement with brown aggregate) all using locally available coarse and fine aggregates. Select from 3 standard sandblasted exteriors (moderate, medium, heavy) that may be mixed together to highlight Architectural details throughout the building.

Brick – prudent use of modular size brick for accents using standard sheet coursing dimensions of 10 courses tall. Do not use non-linear coursing patterns. Corner bricks shall not be used. Maintain no more than 50% brick coverage across the building elevation, preferably per panel. Brick shall be selected from the standard Endicott colortexture sample boards (16 colors, 4 finishes each = 64 brick options).

Prototype Design – maintain simple Architectural features repeated throughout each elevation.

3. Openings and Other Elements

Windows – use standard size window openings following OSF guidelines. Limit opening sizes within wall panels to three different sizes to economize production and set up costs. Use of more than three different window opening sizes shall require the approval of Program Management. Refer to tolerance of rough openings per PCI Handbook.

Positioning Openings – maintain all openings (doors and windows) a minimum distance of 18” of any edge of wall panel to prevent additional engineering design and reinforcing materials costs. Standardize opening positions within wall and panel members to economize production.

Metal/Glass Integration – “ribbon” glass areas, large storefronts, and glass/metal curtain walls in place of load bearing precast elements shall not be used with precast panels.

4. Manuals and Resources

Design Manuals – use PCI Handbook.
DIVISION 04 – MASONRY

Specify the following for MASONRY

GENERAL REQUIREMENTS

- Provide a broad scope specification on specified masonry wall components. Do not use multiple narrow scope sections for brick, mortar, and concrete masonry units.
- Interlocking concrete unit masonry and masonry constructed with surface-bonding cement shall not be used as building components.
- Cavity walls constructed of brick veneer, rigid insulation, and CMU back shall be acceptable as the building envelope for additions to existing structures already using this type of construction.
- Rigid insulation shall be installed in such a manner as to prevent thermal bridging in exterior wall systems.
- Split face block shall not be used and ground face block shall only be used in limited Architectural accents and detailing.
- Use products with recycled content and regional materials when possible and when no significant cost is incurred.

UNIT MASONRY ASSEMBLIES

- All corridors and group toilets are required to be constructed with CMU walls. Exceptions for interior administration areas and other low traffic, non-student areas are permitted.
- Use an integral water repellent for exterior applications of concrete masonry units with the exception of exterior face brick. (Water repellent may be used on interior face brick as a deterrent to soiling and staining.)
- Exterior brickwork shall enclose all structural columns and beams of concrete or steel.
- Use Bull-nosed concrete masonry units at pedestrian corners at vertical walls with the exception of the base course, where square corners are allowed.
- Face brick shall comply with ASTM C 216.
- Face brick to include manufacturer, size, color, and bond pattern. Do not use a brick allowance. Face brick shall be utility size.
- Mortar for CMU to be a mix of Portland cement and lime, Type S. Mortar for face brick applications shall be mortar cement, ASTM C 1329, Type N.
- Grout for unit masonry to comply with ASTM C 476, and note “Grout” on the drawings. AE shall avoid non-specific notes such as “Fill block with concrete or “fill bond beam with concrete”.
- Masonry joint reinforcement and ties for multi-wythe walls shall be adjustable (2-piece) type with single pair of side rods and continuous diagonal cross ties or ladder type with separate adjustable veneer ties engaging the cross ties. Horizontal reinforcing with multiple side rods alone shall not be used to tie face brick to CMU backup. All shall be made of hot dipped galvanized steel. Corrugated metal ties are not acceptable.
- Require parging and water proofing of exterior faces of below grade masonry walls.
- Use adjustable masonry veneer anchors for attachment to metal studs have pronged legs to bridge insulation or sheathing and contact studs.
- Require cavity drainage material so that cavities are kept clear of mortar droppings.
- Require extruded polystyrene insulation for cavities.
- Require field quality control testing for mortar and for grout in reinforced masonry walls.

**GLASS UNIT MASONRY ASSEMBLIES**

Glass unit masonry assemblies require written permission from Owner. In the event that permission is granted, use shall be limited to locations where daylighting is required. Security, durability, and privacy shall be maintained. If used, glass unit masonry shall be field assembled or prefabricated glass block panels.

**STONE CLADDING**

Use of natural or precast stone requires written permission from Owner. In the event that permission is granted, it shall be limited to historic preservation or renovation projects where matching is necessary.

**MASONRY RESTORATION AND CLEANING**

- High pressure cleaning is not acceptable and cleaning materials shall be approved by both the brick and mortar manufacturers prior to cleaning.
- For historic structures or materials, the Secretary of Interior Standards for the Treatment of Historic Properties and the National Park Service Preservation Briefs for masonry Restoration and Cleaning shall be followed.
DIVISION 05 – METALS

SPECIFY the following for METALS

STRUCTURAL STEEL

- That the steel fabricator either be AISC certified or provide documentation certifying that all steel fabrications are made in accordance with AISC standards and guidelines.
- A light grey primer for interior exposed structural steel that shall remain unpainted.
- Exterior structural steel shall be hot dipped galvanized and field or factory painted with high performance coating.
- Approved high-performance coating manufacturers can be found in Appendix A.
- Where steel members are to be fireproofed, no field primer is required. A pre-installation conference shall be held shortly after the layout is performed.

STEEL JOISTS

- Specify open-web K-series joists for floors and roofs, and LH-series for long-span applications.
- Specify a light gray primer for all joists.

COLD-FORMED METAL FRAMING

- Provide submittal requirements for design calculations, shop drawings, and installation drawings for curtain-wall framing supporting exterior masonry veneer, floors, and roofs.
- Performance requirements shall show the member depths on the drawings.
- Require the fabricator design the metal thickness based on the design loads and deflection criteria specified. The design loads shall be shown on the structural drawings.
- G60 coating for non-masonry panel supports, and G90 coating for masonry wall supports.
- Deflection tracks for vertical deflection clips designed to allow for construction tolerances and to accommodate live load deflection of the primary building structure.
- Un-punched studs and track when fabricating lintels.
- A Pre-installation conference shall be held shortly after the layout is performed.

METAL FABRICATIONS

- Steel lintels are required to be hot dipped galvanized steel.
- Include steel framing and supports for mechanical and electrical work, and coordinate with Divisions 23 and 26.
- Use ferrous metals for typical components.
- Use hot dipped galvanized steel for exterior components.

EXTERIOR METAL PANELS

- Exterior Metal Panels shall be located a minimum of 8 ft. above ground level. Aluminum Composite Panels shall not be used.

METAL STAIRS

- Preassembled metal stairs with concrete-filled metal pan treads.
• Require structural calculations and detailed shop drawings be prepared by a qualified professional engineer licensed and legally authorized to practice in South Carolina.

• Specify pipe and tube railings as an integral part of the stairs, however, when handrails and railing systems are required as isolated units, they shall be specified in the following section “Pipe and Tube Railings.”

PIPE AND TUBE RAILINGS

• All handrails and railings shall be fabricated from aluminum.

• Painted handrails and railings are not allowed.

• Specify placement of each joint system on shop drawings. These shop drawings are to be included in close out documents to Owner.

GRATINGS

• Specify metal bar gratings, expanded metal gratings, formed-metal plank gratings, and extruded-aluminum plank gratings as required for the specific project and application.

• All exterior or weather-exposed gratings are required to be made of hot dipped galvanized steel.

ARCHITECTURAL JOINT SYSTEMS

• Specify exterior and interior building joint systems, with and without fire barriers that accommodate movement resulting from one or more causes such as thermal changes, seismic forces, or wind sway.
DIVISION 06 – WOOD, PLASTICS AND COMPOSITES

REQUIRE the following for WOOD, PLASTICS AND COMPOSITES

ROUGH CARPENTRY

- The use of wood construction shall be approved prior to the Schematic Design Phase.
- The use of wood shall be limited to furring, nailers, blocking, miscellaneous lumber, and construction panels -- wood nailers and blocking are not required to be fire-retardant.
- Plywood is required to be pressure treated.
- Plywood and composite wood based materials installed on the inside of the air barrier shall be free of added urea-formaldehyde. If the construction type requires non-combustible materials or assemblies, consider a different product or assembly.
- Fire-retardant plywood shall be used with caution for roof construction and only where specifically approved in writing by OSF prior to including it in any Contract Documents.
- All lumber and plywood materials shall be stored off the ground and under cover, which has been vented to prevent condensation in order to prevent warping.
- Wood materials that come into contact with the ground or masonry shall be properly treated with moisture and pest protection.

FINISH CARPENTRY

- Specify cope at returns and miter at corners to produce tight fitting joints and use of scarf joints for end-to-end joints.
- For Major Renovations: Damaged or defective finish carpentry shall be repaired to eliminate functional or visual defects. Where not possible to repair, require contractor to replace finish carpentry and adjust joinery for uniform appearance.

INTERIOR ARCHITECTURAL WOODWORK

- AE shall require compliance with “Architectural Woodwork Standards” published by the Architectural Woodwork Institute (AWI)
- Transparent Finished Casework; Casework is required to be made of premium graded oak and of a heavy-duty construction.
- Doors: Construction and thickness shall be “as required” to prevent warping.
- Shelves: Do not exceed spans of 3 ft. for ¾ in. thick shelves and 4 ft. for 1 in. thick shelves.
- Countertops: General use and group restroom countertops shall be solid surface materials (countertops and backsplashes). No laminate or concrete countertops will be permitted.
- Coordinate color selection.
- Cabinet hardware: shall be heavy duty, 4 inch pull rod for drawer and door pulls
- Drawer Slides: shall be 100 lb. capacity wheeled slides with self-closing feature.
- Door Hinges: shall have concealed hinges, European style, self-closing with Built-in horizontal and vertical adjustment. Require 5 Knuckle hinges on typical casework
- Require door silencers for all cabinet doors.
• All cabinets and/or casework shall be constructed of premium grade wood. Non cabinet or
furniture grade plywood is permissible only if finish veneer is applied. Particle core materials
are not accepted.

• Where transparent finish is shown, cut doors and drawer fronts of each run of cabinets from
one “counter front” sheet of plywood and install them in the same position so that the grain
runs vertically and grain matches between adjacent doors and/or drawers. Contractor shall
be required to submit samples of transparent finishes that show the extremes in color
variation.

• Enclosed cabinets shall not be installed underneath sinks. All sink base cabinets shall be
slotted / perforated to allow ventilation.

• Shelving: the maximum shelf length shall be 36-inches, PE equipment storage shall be metal
and shall provide 24-inch deep shelving in the custodial area for storage of large cartons and
supplies.

• Media Center: the sill height for windows shall allow for installation of 48” high wall mounted
shelving units. Freestanding units shall not be more than 48”. Wall units may be up to 72”
high

• Contractors shall not install Architectural woodwork until the building is enclosed, the
permanent heating and cooling system is in operation, and the residual moisture from plaster,
concrete masonry or terrazzo has dissipated.
DIVISION 07 – THERMAL AND MOISTURE PROTECTION

REQUIRE the following for THERMAL and MOISTURE PROTECTION

- AE shall contract with an independent Registered Roof Consultant (RRC) if project involves any roofing, including but not limited to: new construction, roof replacement, modifications to the existing roof systems, and new penetrations.
- The RRC shall write and furnish the AE with all (Division 7) specification sections related to the roof design, including all components.
- The RRC shall be responsible for monitoring roof construction and final acceptance and provide weekly inspection reports to Program Management, the Contractor, and AE within three (3) working days of each visit.
- Low Sloped Roofs: Specify a modified bitumen roof system with a minimum slope to point of discharge of 1/4 inch per foot for all low-sloped systems.
- Canopies and Covered Walkways: Specify overhead canopies/covered walkways at primary building entrances, car loops and bus drop-offs and shall specify the following:
  - Structure shall have sufficient slope to drain water away from the building.
  - Structure shall not drain across sidewalks
  - Sheet metal panel systems shall be used for soffit construction. Gutters and downspouts shall be used to direct water away from the sidewalks or discharged water into underground storm drain lines. (Stucco and drywall soffits shall not be used.)
- Skylights: Overhead sloping glazing shall be used only with approval of Owner on a specific project, prior to the start of the Design Development phase. Overhead glazing shall meet OSHA 29 CFR 1910.23.
- Insulation: Minimum R-value insulation shall be used in the initial Whole Building Energy Simulation with additional insulation added to improve building envelope performance as justified by life-cycle cost analysis (performed by AE). Refer to OPR for project specific requirements for energy conservation and envelope insulation values.
- Provide a roof information card that identifies materials, manufacturers, substantial completion data, Contractor, designer, contact for warranty repairs, and other basic information.
- In Big Box Spaces (i.e. Gymnasium, Multi-Purpose Rooms, and Cafeterias) use an Acoustical Steel Roof Deck to control acoustics.

FLOOR WATERPROOFING

- Floor waterproofing for restrooms, custodial closets, dishwasher rooms, kitchens, showers, and other areas with water faucets/sinks/etc.
- Specify the turn up membrane 4 inches at walls.
- Prior to installation of finish flooring, the Contractor shall flood the entire waterproofed area with water at least 2 inches deep at the shallowest point for 24 hours.
- Testing shall be completed in accordance with ASTM D 5957. Contractor shall repair any leaks and retest.

ELASTOMERIC SHEET WATERPROOFING

Where applicable, require sheet waterproofing.
HOT FLUID WATERPROOFING

WATER REPELLENTS
Water repellents shall be used in accordance with SWRI standards.

BUILDING INSULATION
- Insulation values shall be equal to or exceed those listed in the 2009 IECC Energy Code.
- Spray fireproofing over the exposed portion of the insulation shall be tinted to be able to observe complete coverage.
- Roofing insulation shall be staggered to avoid thermal bridging at seams and to produce the desired thickness. Roofing insulation shall be multi-layered with taped perpendicular joints.
- Acoustic Insulation shall be installed for Recording Studios, Music Rooms and Practice Rooms.
- Lightweight insulating concrete or Exterior Insulation and Finish Systems shall NOT be used.

AIR BARRIER SYSTEMS
See IBC 2012 code for requirements.

ASPHALT SHINGLE ROOFING:
- Shall not be used except on outbuildings and field houses. When used, shall be designed and built with 30-year architectural shingles with 110 mph or better wind rating.
- Downspouts shall drain into an underground drainage system.
- Gutters shall have leaf guards installed.
- Gutter downspouts shall have cast iron boots at ground to protect from landscape equipment and other damage.
- Gutter Boot height shall be a minimum 3 ft. above grade.

SHEET METAL ROOFING
- Standing seam roofing shall be used for medium pitched roofs. Asphalt shingles shall not be used.
- System shall be a prefabricated, pre-finished metal panel roofing system.
- System shall include the metal panels, sliding clips and other attachments, flashing to adjacent construction and other accessories.
- System shall meet the requirements of UL580 and ASTM E 1592.
- Finish of all roofing panels, trim and accessory elements shall have shop-applied high performance anti-corrosion coating. Acceptable coating manufacturers are found in Appendix A.
- Use of exposed fasteners shall be minimized and all fasteners, exposed or covered, are required to be of stainless steel construction and shall match the color of roofing by means of factory-applied coatings.
- All metal panel roof areas shall drain into external gutters and downspouts.
- Downspouts shall drain into an underground drainage system.
• Gutters shall have leaf guards installed
• Gutter downspouts shall have cast iron boots at ground to protect from landscape equipment and other damage.
• Gutter Boot height shall be a minimum 3 ft. above grade

MEMBRANE ROOFING
• Single ply Thermoset or Thermoplastic roofing is not permitted.
• Minimum slope to point of discharge shall be ¼ in. per foot and built into the structure. Use of tapered insulation for obtaining primary slope shall not be used.
• All low slope roof areas shall be accessible by means of a roof hatch, exterior door or exterior roof ladders. Roof hatch shall be located in a service area, typically located in a custodial closet.
• Roof Insulation: insulation thickness shall be a minimum of two layers as required to meet specified thermal resistance.
• Flashing: Base flashing shall be type recommended by membrane manufacturer to meet warranty requirements. No vertical lap joints in flashing closer than 8’ o.c. shall be permitted.
• Downspouts shall drain into an underground drainage system.
• Gutters shall have leaf guards installed
• Gutter downspouts shall have cast iron boots at ground to protect from landscape equipment and other damage.
• Gutter Boot height shall be a minimum 3 ft. above grade

SBS MODIFIED BITUMEN BUILT-UP ROOFING
• No “Single Source” specification shall be allowed.
• Require a minimum 3-ply hybrid modified bitumen roof for low slope roofs. The modified bitumen cap sheet shall have a factory applied surfacing. Phased installation shall not be permitted unless approved by Owner and shall then be approved by the manufacturers in writing. The minimum design performance standards shall be as noted:
  o FM Class 1A-90 minimum (Must still meet site specific wind and seismic requirements)
  o FM LSPD 1-49 for Perimeter Flashing
  o FM LSPD 1-29 for Above Deck Roof Components
  o NRCA Roofing and Waterproofing Manuel (Fifth Edition)
  o SMACNA Architectural Sheet Metal Manual (Fifth Edition)
  (SMACNA details shall be modified to meet project specific requirements and shall be showing on the drawings.)
• For low-slope roofs, the building structure shall slope a minimum of ¼-inch per foot. Sloped insulation may be used to form crickets and direct water to roof drains and scuppers. At interior roof drains, install tapered insulation around all four sides of the drain to create a sump. Place a granular surfaced SBS 250 target around the roof drains to prevent flood coat and aggregate from clogging the drain. Strainers shall remain in place at all times once the drains are connected to the building drainage system.
• Specify a two-ply base flashing system with surfacing to match roof surfacing
• Perimeter nailers and cant strips shall be of treated wood and installed in accordance with FM 1-49.

• Show wood blocking or wood nailers at the intersection of the roof, walls, and parapets based on the roof framing structure design.

• Polysiocyanurate board insulation and cover board. Cover board shall be roof system manufacturer’s recommended material. Indicate R-values on the drawings.

• Base flashings shall be secured at 8-inches minimum on center, and seal all laps with substrate joint tape embedded and coated with asphalt roofing cement. Base flashing shall be minimum 12-inches above roof. Install stripping plies with two layers, and extend onto roofing membrane in 6 inches and 12 inches respectively. All base flashing shall be aluminum or stainless steel.

• Walkway pads shall be placed at the roof hatch and at the service side of the rooftop HVAC units. Specify mineral-granule-surfaced walkway pads and show the locations on the roof plan.

• When a fire-rated roof assembly is required, verify that the manufacturer’s roof system, including the metal deck has been tested by UL.

• Interior roof drains shall be cast iron, including bowl, clamping ring, and strainers, with brass bolts. Roof drains shall be located as close to midpoints between columns as reasonable.

• An independent third party RRC shall be retained for 3 days for the first 100 squares and 1 day for each additional 50 squares. The number of inspection days may be altered up or down on the direction of Owner. Design modifications to the roofing system shall be brought to the attention of Owner, Program Management, AE, RRC and manufacturer. All modifications shall be agreed upon by all parties and have no effect on the warranty.

• Downspouts shall drain into an underground drainage system.

• Gutters shall have leaf guards installed.

• Gutter downspouts shall have cast iron boots at ground to protect from landscape equipment and other damage.

• Gutter Boot height shall be a minimum 3 ft. above grade

MANNUFACTURED ROOF SPECIALTIES

Specify roof specialties including copings, fasciae, gutters, and downspouts be formed, fabricated, finished, and assembled in the factory. Where possible, one manufacturer should be responsible for all the roof specialties on the Project.

ROOF EXPANSION ASSEMBLIES

• Expansion joints shall be constructed as a raised curb with a sloping 24-gauge galvanized pre-finished metal cover with interlocking standing seam joints at a maximum spacing of 10 feet. Secure with concealed fasteners every 8-inches on one side of the joint. The opposite side shall allow for expansion and contraction. Height shall be in accordance with manufacturer’s recommendations.

• Pre-manufactured expansion joint covers, i.e. Expandoflash, shall not be accepted.

• Isolate non-supported roof/wall sections and changes in deck directions.

• Specify 45-mil PVC or EPDM beneath edge metal and expansion joints.
• Require documentation of coordination for installation of exterior wall joint systems with roof expansion assemblies. Require all contractors involved to sign off that all transitions are watertight following installation.

**ROOF ACCESSORIES**

• Roof accessories (pre-manufactured metal curbs and equipment supports, safety rails, relief vents, ridge vents, heat and smoke vents, and roof hatches) shall be galvanized steel sheet metal construction with a factory primer. Roof vents and roof hatches may be aluminum with a backed enamel finish. Hatches shall be 30”x36” size is specified with a steel safety post at the top of the ladder. Access to equipment by access hatch only from inside an inhabited space is poor design. Access shall be by interior stairwell or exterior ladder.

• AE shall attempt to design roof and located equipment to avoid the need to utilize safety rails. If safety rails are necessary, AE to get approval from Program Management for location of safety rails. AE shall verify requirements for safety rails around roof mounted equipment with current OSHA, OSF and AHJ requirements.

**SPRAYED-ON FIRE-RESISTIVE MATERIALS**

• Coordinate locations of fireproofing with the structural engineer.

• If fireproofing is to be exposed, and aesthetics is a concern, specify a sample or mockup for approval.

• Steel columns in mechanical rooms and high traffic areas shall be protected by cast in place concrete in lieu of spray on fire protection.

• Specify field quality testing for dry density and bond strength.

• Cementitious-sprayed fire-resistive materials with a minimum dry density of 39-lb/cu. ft. for exposed applications.

• Some manufacturers claim that the minimum dry density resulting from laboratory tests is sufficient to meet the Project requirements. The AE may specify higher densities to satisfy other requirements in addition to fire rating and durability. Clearly note in the specifications that the specified dry density and thickness shown are required regardless of the manufacturer’s fire-resistive claims.

• Require Contractor to be responsible for sequencing the work, If Contractor installs equipment before the fireproofing, Contractor shall protect all installed work from over spray.

• The original installer, using the original means and methods for installation, shall do all patching of the fireproofing. Isolation patching of the fireproofing is not acceptable.

**THROUGH-PENETRATION FIRESTOP SYSTEMS**

• All firestopping shall be installed by a single subcontractor certified to install through-penetration firestopping systems.

• Shop drawings shall show each kind of construction condition penetrated and the manufacturer’s tested firestop design designation to meet the required ratings of all UL Assemblies shown. This documentation method requires a single source responsibility for the design and product delivery for the Project. UL Assemblies shall be specified.

**FIRE-RESISTIVE JOINT SYSTEMS**

• A single source manufacturer shall detail and supply the joint systems for the entire project.

• Require the Contractor to submit details on each proposed assembly identifying intended products and applicable UL Assembly or UL classified device.
• Require the Contractor to coordinate with review agencies when inspection or rated penetrations are required.

JOINT SEALANTS

• Use elastomeric sealants. Limit latex sealants to non-moving joints in drywall construction.

• Use low or ultra-low modulus sealant for use on metal copings, metal fasciae, and other metal components where a high degree of thermal movement is expected.

• Use low to medium modulus sealants for typical exterior and interior joints between masonry, concrete, doorframes, windows, and joints between combinations of these materials.

• Use medium to high modulus sealants for applications where joint movement is limited to +/- 25%, for example glazing, curtain-wall, and structural glazing applications.

• Caulk precast concrete joints with a low to medium modulus sealant capable of withstanding structural movement of 50% in extension and 50% in compression without adhesive or cohesive failure.
DIVISION 08 – OPENINGS

SPECIFY the following for OPENINGS

WOOD DOORS

- Swinging interior “A” label and “B” label double doors shall be wood. Only domestic species of wood shall be used.

- Structural Composite Lumber (SCL) core wood doors with transparent finish in hollow metal frames shall be used on most interior doors including 20-minute constructed fire doors. Doors shall be pre-fitted, pre-finished and pre-machined at factory for finish hardware. High density mineral core blocking reinforcement for mineral core doors shall be provided at hinge, closer, lock and strike locations. Doors shall be 1-3/4 in. thick and 7ft.high.

- Wood doors shall be solid 5-ply hot pressed (cold pressed not acceptable) bonded core with no added urea formaldehyde or use formaldehyde-based glue in the manufacturing process.

- All doors in instructional areas shall have narrow vision lights. No doors shall be delivered to the building until weatherproof storage space is available. Store doors in a space having controlled temperature and humidity range between 30 and 60 percent (conditioned air). Stack doors flat and off of the floor, supported to prevent warping. Protect doors from damage and direct exposure to sunlight.

- Doors shall not be hung until the building is enclosed, the permanent heating and cooling systems are in operation and indoor relative humidity has been maintained at a level of less than or equal to 55% for a minimum of 7 consecutive days. Contract documents shall require contractor to create and maintain a log of relative humidity readings for the purpose of documenting these conditions prior to installation of doors.

HOLLOW METAL DOORS AND FRAMES

INTERIOR

- Doors shall be 1-3/4 in thick and 7ft. in height and be full flush.

- All interior metal doors, metal frames and metal sidelight frames shall be hollow metal and shall be:
  - ANSI A250.8, grade 3 extra heavy model 2A (welded, seamless) primed doors for field finish for interior doors
  - Face sheets and frames fabricated from 16-gauge cold rolled steel. Knock Down frames are not allowed.

- Jamb anchors at masonry wall openings shall be standard wire anchors and jamb anchors for plaster and gypsum wallboard partition openings shall be a minimum of 18-gauge steel. Frames at masonry walls shall be filled with grout.

- Specify door reinforcement as follows:
  - A minimum of 12 gauge for hinges and be continuous channel for the full height of door,
  - 12 gauge for closers and be a continuous channel for the full length of the header
  - 14 gauge for strikes and be a continuous channel for the full height of the door.
  - 7 gauge reinforcements shall be used for hinges on frames.
  - 26 gauge steel plaster guards or mortar boxes welded to the frame shall be provided at hardware cutouts where installed in concrete, masonry or plaster openings.
Vision lights shall be provided at stairs/corridor doors, except at 3 hour labeled openings.
Glaze with ¼ in. UL labeled glass at fire rated doors and ¼ in. tempered glass at other doors.
Light size shall be 3 in. x 33 in. at fire-rated doors. Vision lights shall be located as required by ADA. Glazing kits shall be (concealed type) flush with door surface.

All doors off hallways, corridors, and stairways shall have stainless steel kick plates. For main exit doors, kitchen, storerooms, and other doors subject to heavy use, specify extra-large stainless steel kick plates.

Doors shall not be hung until the building is enclosed, the permanent heating and cooling systems are in operation and indoor relative humidity has been maintained at a level of less than or equal to 55% for a minimum of 7 consecutive days. Contract documents shall require contractor to create and maintain a log of relative humidity readings for the purpose of documenting these conditions prior to installation of doors.

EXTERIOR DOORS (FRP DOORS)

Exterior doors require continuous stainless steel hinges.

Water testing of door shall be required

Doors from loading docks into the kitchen receiving areas must be a minimum of 8 feet tall and 42 inches wide.

ACCESS DOORS AND FRAMES

Shop-primed galvanized steel shall be used for general locations and stainless steel for wet locations.

Locations for access doors for above ceiling equipment shall be shown on drawings.

Access doors are not permitted for above ceiling HVAC equipment larger than 5 tons of cooling capacity. Refer to Division 23 for detailed access requirements.

OVERHEAD COILING DOORS AND GRILLES

Overhead roll up doors and grilles shall be of metal construction and shall not interfere with required egress from occupied spaces.

Dish return at cafeterias shall be stainless steel roll up doors.

The design of the kitchen/serving area shall not permit the use of fire-rated roll-up doors.

Doors shall be manual operation by crank or chain unless size dictates otherwise.

Specify a slide bolt locking device (no lock cylinders permitted).

ALUMINUM ENTRANCES

Door reinforcement shall be a minimum of 12 gauge for hinges and shall be continuous channel for the full height of door,

12 gauge for closers and shall be a continuous channel for the full length of the header

14 gauge for strikes and shall be a continuous channel for the full height of the door.

7 gauge reinforcements shall be used for hinges on frames.

26 gauge steel plaster guards or mortar boxes welded to the frame shall be provided at hardware cutouts where installed in concrete, masonry or plaster openings.

Finish shall be Anodized or Kynar (Kynar to be provided with Coastal Warranty).

ALUMINUM STOREFRONT
- All exterior single access point openings shall be Fiberglass Reinforced Plastic (FRP) doors with aluminum storefront frames.
- Multiple access point opening requiring electronic locks or swipe cards shall be aluminum storefront doors and frames. All electronic locks shall be electronic strike mechanisms; magnets are not permitted.
- Exterior storefront applications shall include a thermal break.
- Door stiles shall be minimum of 5 inches in width.
- Finish shall be Anodized or Kynar

**GLAZED ALUMINUM CURTAIN WALLS**

- Glazed aluminum curtain walls are seldom used in school projects comprised of one or two stories (floors). Storefront systems are usually adequate. Require project specific preconstruction testing.
- When both aluminum storefront and glazed aluminum curtain wall systems are used on a project, clearly define and label each type on the drawings to correspond to the specifications. Require a curtain wall consultant when using curtain walls or specify delegated design to be provided by curtain wall manufacturer.

**STEEL WINDOWS AND FRAMES**

- Exterior windows shall be inoperable except for locations dictated by OSF requirements
- All exterior windows shall be equipped with insulating glass.
- Hollow metal glazing frames shall be fabricated from 14 gauge cold rolled galvanized steel.
- Do not extend hollow metal window systems to ground level.
- Frame anchorage at masonry openings shall be standard wire anchors. Frames at masonry openings shall be filled with grout. Frames at drywall or plaster openings shall be minimum 18-gauge steel and at a minimum shall be placed at the top, center, and floor.
- Blinds shall be furnished under FF&E.
- Water testing window openings shall be required.

**ALUMINUM WINDOWS**

- Specify thermally broken, single hung aluminum windows and equip operable windows with limit opening hardware. Provide egress hardware and opening devices for windows designated as egress windows. Indicate windows for emergency use by mechanically fastened signage.
- Windows shall be based on performance requirements listed in AAMA/NWWDA 101/I.S.2. Specify Heavy Commercial (HC) class, performance grade 40.
- Show typical window elevations, schedule of each type and size, locations, in wall construction details, and glazing details on shop drawings. Product data shall include manufacturer’s specifications and test reports from an AAMA accredited laboratory.
- Samples for each specified finish type shall be provided.
- Hinges shall be concealed stainless steel. Cam handles and strikes shall be bronze. Double hung egress windows shall have only one center lock. Two locks shall be required on all other double hung windows.
- Insect screens shall be aluminum wire fabric, charcoal grey color.
• Windows shall match the storefront color and finish.
• Blinds shall be furnished under FF&E.
• Water testing window openings shall be required.

SKYLIGHTS
Skylights and solar day lighting tubes shall only be used when no other type of natural day lighting design is possible. Specify factory-assembled glazed unit skylights with integral curb for installation in flat roof areas. Clerestory windows are preferred.

GLAZING
• Impact resistant, insulated, Low-E glass shall be used for all exterior applications throughout the project. Impact resistant glass is required throughout Charleston County School District by Owner.
• Use Solargray, Solarbronze and light green Solex glass tints. When selecting a tint, maximize visible light transmittance while balancing code requirements for solar heat gain coefficient (SHGC) and U-values. Other colors may be considered and approved by Owner.
• When multiple glass types are used in the Project, identify each type on the drawings and provide a glass schedule in the specifications to describe the characteristics of each type.

ONE WAY MIRRORED GLASS
• All elementary school work rooms, CD-kindergarten rooms shall require at a minimum, one-way, ½ lite mirrored glass installed in doors.

FINISH HARDWARE
• Hardware shall be based on the approved hardware shown in the Appendix A “Preferred Manufacturers”.
• AE shall schedule a hardware coordination meeting with Hardware consultant, Owner Locksmith, and Owner Security office.
• Finish hardware shall be stainless steel. Door hinges shall be stainless steel Exterior doors shall have continuous stainless steel hinges. Panic devices shall be non-painted, anodized aluminum or stainless steel.
• All non-rated exit devices shall have the ¼ turn hex key dogging. Only the main entrance, faculty and students shall have keyed entry and ¼ turn hex key dogging.
• All double door entrances and foyer entrances shall have fixed mullions, with the exception of those pairs of doors designated loading and unloading of furniture and other large objects and pieces of equipment.
• All corridor fire rated doors shall utilize the appropriate trim, less bottom rod and shall have the appropriate magnetic hold open device connected to the fire alarm system. AE to address floor finish below all fire rated doors.
• Six (6) months after acceptance of the Project, the installer, accompanied by Owner’s representative (for quality assurance) and the finish and security hardware representative(s) shall inspect all hardware. Require Contractor to fix items covered under warranty.
• All exterior doors, staff entrances, foyer egress doors and other strategic locations identified on a project specific basis shall utilize an electronic strike, fail secure, locking device with a key bypass. No magnetic locks permitted. Flush mount hardware and foam shims are not allowed.
• Lock cylinders:

Charleston County School District
Design Requirements for New Construction and Major Renovation
Release #03 - June 2016. Revisions to the text from the previous version are underlined and logged in Appendix B. 46
Shall be patented interchangeable core locks.

Door keying shall be grandmaster keyed as approved by Owner and after a keying conference with school officials takes place.

On renovation projects where the existing hardware shall remain in place, any new lock shall be keyed to the existing system as determined by Owner’s locksmith. Contractor shall directly contact and communicate with Owner’s locksmith for specifications. Owner’s locksmith will install all final cores with the assistance of hardware supplier. The hardware supplier shall provide Owner with the final biting list on all projects to be included with project close out documents.

On renovation projects, where additions and renovations exceed 50% of the existing facility, all lock hardware on existing doors shall meet ADA standards.

On all new construction, locksets shall be provided with construction cores. Utilize Corbin Russwin color coding system.

**KEY BOX**

- Provide key box in school vault, sized to hold 150% of building keys. Keys to be installed in key box by Owner locksmith at substantial completion.

**KNOX BOX**

- Require a recessed Knox Box in the building exterior near the main entrance (usually near where the remote FACP is located)
DIVISION 09 – FINISHES

SPECIFY the following for FINISHES

- All finishes including colors, textures, sizes, and accessory materials shall be detailed in a Finish Schedule on the drawings. All floor, wall, and ceiling finishes shall be listed with a corresponding color or finish code. All colors shall be approved by the owner and shall follow CCSD color palettes.

- Color selections, type of paint, and VCT floor patterns, varying ceiling panel types and uses, ceramic tile patterns, and painting schemes shall be included in a Color and Material Legend as part of the Finish Schedule. Include color and finish schemes for plastic laminate for millwork, toilet partitions if more than one color is used, acoustical wall panels, painted doors and frames, exterior field painted components, such as doors, frames, ladders, handrails, and exposed structural steel.

- Paint finishes shall be in accordance with the Master Painters Institute (MPI) Architectural Painting Manual. Finish levels G1 through G3 shall not be permitted in any area.

- Epoxy Terrazzo flooring shall be permitted in main entry lobby, group restrooms and all corridors (except administration area corridors, which will have the same flooring as the rest of the administration area).

- Quarry tile shall only be permitted in kitchen areas.

- Color Palate selection shall follow this procedure:
  - Color selection options will be provided from a list of pre-approved Owner color schemes.
  - School theme colors (outside of color schemes may be used in the main lobby, cafeteria, and gymnasium). Owner will approve school colors not included in pre-approved schemes.
  - AE shall make color selections from the Owner approved palate in new construction projects and major renovation projects.

FLOORING

- CD, Head Start, & Kindergarten Classrooms: All carpet shall be carpet tile. VCT at “Wet Areas”.

- Cafeterias and Multipurpose rooms: Commercial rubber tile type flooring with hammered finish.

- Academic Classrooms: Carpet Tile

- Locker Rooms: Unstained polished and sealed concrete

- Art Rooms: Unstained polished and sealed concrete – non skid

- Laboratories: VCT

- Group Restrooms: epoxy terrazzo or shall be 8” non-porous or glazed tile of dark color with dark grout.

- Single Toilets: 8” non-porous or glazed tile of dark color with dark grout. Individual classroom toilets to receive seamless vinyl flooring. No wainscot at single toilets. Epoxy paint walls.

- Locker Rooms: Unstained polished and sealed concrete
- Kitchens: 6” quarry tile (dark color with dark grout)
- Middle and High School Gymnasiums and Practice Gyms: Tongue and groove maple wood flooring only.
- Stage Floor (Elementary and Middle Schools): Tongue and groove maple wood flooring only.
- Stage Floor (High Schools): Wood flooring system consisting of two layers of ¾” plywood. No tongue and groove strip flooring.
- Corridors: Epoxy Terrazzo
- Offices: Carpet tile
- Media Center: Carpet tile
- Health Suite: VCT
- Music Rooms/Band/Chorus/Drama: Carpet tile
- Computer Labs: Carpet tile
- Stairwell (landing and rises): Rubber stair treads, risers, and landings
- Teachers’ Lounge: Carpet tile
- Entrance/Air Locks: Epoxy terrazzo with walk off mat
- Mechanical rooms/closets: Sealed concrete
- Electrical rooms/closets, custodial closets: Sealed concrete
- Security rooms/closets, technology rooms/closets: Sealed concrete
- Storage rooms: Sealed concrete
- Maintenance stock shall include five cases of floor tile (VCT) and five cases of carpet tile.

**WALL FINISHES**

- Grout for wall tile shall coordinate with the colors of the tile floor grout.
- Exposed concrete masonry shall be painted. Specialty masonry, for example ground face CMU, when used on the interior shall be protected from soiling and staining. Exterior applications of these materials are covered in Division 4.
- Exposed concrete masonry finished in Food Prep areas shall comply with DHEC requirements.
- Ceramic tile or stainless steel sheets over masonry in dishwashing rooms.
- Gypsum board walls shall be used in administrative areas and in areas where flexibility or expansion is likely. Plaster and Gypsum walls are not acceptable in corridors, except for intra-office corridors.

**GYPSUM BOARD ASSEMBLIES**

- Gypsum board walls and ceilings shall be specified as UL and ASTM E 119 assemblies, including steel stud framing, suspension systems, and various types of panel products and installed per USG and/or manufacturers recommendation.
- Gypsum wall board shall be 5/8 in. thick, type X for walls and for ceilings. Provide sag-resistant gypsum board for ceiling applications. Vinyl laminated gypsum grid panels may be used in wet environments such as kitchens, where accessibility may be required, and security is not a primary concern.
• Water-resistant gypsum board shall be used for wet environments and for tile backing not subject to constant wetting including kitchens and group restrooms. Specify cementations backer units for tile backing in showers.

• Abuse-resistant gypsum wallboard shall be used for areas requiring a higher resistance to 8 feet AFF to surface indentation and through-penetration.

• Specify galvanized metal studs with a G40 coating for interior wall, and a G60 coating for exterior wall applications. Stud depths shall be indicated on the drawings, but not in the specifications, unless one size is used throughout the Project.

• Deep-leg deflection tracks shall be used for partitions extending to the structure to accommodate live load deflections. Do not extend partitions to the structure with no provision for deflection. Under normal circumstances, a deflection limit of 1/240 and a wall load of 5-to 15-lbl/sq. ft. shall be acceptable.

• Gypsum board is not allowed in corridors or group restrooms rooms as wall material.

• Specify STC ratings for partitions using sound attenuation blanket insulation.

GYPSUM BOARD SHAFT-WALL ASSEMBLIES

• AE may specify gypsum board shaft-wall assemblies for fire-rated enclosures for vertical shafts, ductwork chases, elevator shafts, and other non-load-bearing enclosures as an alternative to masonry shaft enclosures.

ACOUSTICAL PANEL CEILINGS

• Acoustical Panel Ceilings shall be manufacturers standard lay-in panels, 24 in. X 24 in. grid size panels, square edge, with white finish. 24 in. X 48 in. panels shall not be used.

• Washable panels shall be used in kitchens and above serving lines. Any panels containing penetrations of any type (i.e. routers, sprinklers, smoke alarms, etc.) shall be specified to be matching water resistant vinyl tile.

• 24 in. x 24 in. standard panels with 15/16 in. grid by same manufacturer as panels to maximize warranty. 9/16 in. grid shall not be used. Humidity resistant panels shall be used for all locations.

• Install panels only after building is enclosed, the permanent heating and cooling equipment is in operation and indoor relative humidity has been maintained at a level of less than or equal to 55% for a minimum of 7 consecutive days. Contract documents shall require contractor to create and maintain a log of relative humidity readings for the purpose of documenting these conditions prior to installation of panels.

• No metal or other specialty ceilings shall be used. Refer to Appendix A “Preferred Manufacturers” for ceiling material types, no deviations are allowed.

• Show ceiling heights on both the finish schedule and on the reflected ceiling plans.

• Lay-in ceilings are acceptable in single use toilets

• Lay-in ceilings are not acceptable in group toilets.

ATHLETIC-FLOORING ASSEMBLIES

• Resilient athletic flooring in high school new construction for multipurpose activity/P.E., etc. shall be used for wrestling, cheerleading and dance activities.

• Flooring shall be 3 mm or thicker commercial rubber tile type flooring. See Appendix A for Preferred Manufacturers.
Maple flooring systems shall be used in gymnasiums for Middle Schools and High Schools. Assembly shall include hard maple strips installed over a subfloor system for shock-absorption and shall comply with the DIN standard for shock absorption, ball bounce, vertical and area deflection, surface friction, and rolling load. Wood flooring shall be strip flooring, tongue-and-groove, 25/32-inch thick, standard grade (Second & Better).

Wood athletic flooring systems shall be “AACER” “Cush II” with pads and double ¾” plywood under floor or pre-approved equal; #2 Maple. Oriented Strand Board (OSB) board shall not be accepted.

Metal accessory components shall be minimum 16 gauge hot dipped galvanized steel.

Specify gym floor finish. No less than four coats total and not less than two finish coats shall be provided.

Game line, marker paint, team logo in center court and school name under goals (logo and name in high school main gym only) shall be high-gloss enamel compatible with floor finish. Game lines shall be applied between final seal coat and first finish coat.

Laminated oak flooring or parquet-block requires Owner approval.

**RESILIENT FLOOR TILE**

AE shall specify that contractor shall use Owner’s current flooring contractor to furnish and install all Vinyl Composition Tile (VCT). AE shall specify that Contractor shall apply three coats of wax following installation, prior to turnover.

Tiles shall lay square with room. If patterns and alternate tile layouts are part of the design, clearly show the patterns and colors on the drawings.

VCT shall not be specified for stair treads, risers and/or landings.

AE shall specify that Contractor shall clean and prepare one classroom for Owner inspection as the standard for cleaning and waxing.

Floor finishes shall be protected from damage and construction activities until turnover.

AE shall specify that final cleaning and buffing operations after protective covers have been removed shall be completed by Owner’s cleaning vendor included in Contractor’s construction contract...

Moisture test shall occur prior to installation of adhesives and reference manufacturer’s recommendations regarding moisture content.

**RESILIENT WALL BASE AND ACCESSORIES**

AE shall specify that contractor shall use Owner’s current flooring contractor to furnish and install all rubber base and accessories. Black vinyl base, Type TV, 6-inches high and 1/8 inch thick only; 4 inch base allowed at cabinetry. Floor accessories (carpet edge for glue-down applications, reducer strip for resilient flooring, and tile/carpet joiner) shall be color matched to the finish floor materials. Base required at all sealed concrete floor finishes.

**CARPET**

AE shall specify that contractor shall use Owner’s current flooring contractor to furnish and install all carpet. AE shall not specify product. Specify carpet color as a part of the building color palate. Moisture test of sub surface shall occur prior to installation of adhesives and reference manufacturer’s recommendations regarding moisture content.

AE shall specify that Contractor shall install carpet after building is enclosed, permanent heating and cooling systems are in operation and indoor relative humidity has been maintained at a level of less than or equal to 55% for a minimum of 7 consecutive days.
Contract documents shall require contractor to create and maintain a log of relative humidity readings for the purpose of documenting these conditions prior to installation of panels. Floor finishes shall be protected from damage and construction activities until turnover. Require removal and disposal of floor protection just prior to cleaning and/or furniture delivery.

- Reducer strips shall be installed at all VCT transitions to alternate floor surfaces except where there is a marble threshold.

**ACOUSTICAL WALL PANELS**

- Fabric finished acoustical panels shall be permitted -- preference is to be located out of children’s reach when practical.

- Shop-fabricated acoustical wall panels shall be mounted to a finished wall to allow natural ventilation behind the panel.

- All panels shall conform to the following:
  - 1” or 2” square edge according to Acoustical Absorption Requirements.
  - Use “Z” clip mounting method only.
  - Panel sizes to be as required with a maximum of 4’ x 10’ size.
  - Acoustic fiberglass material to be minimum of 7 PCF density.

**PAINTING**

ALL PAINT FINISH SCHEDULES WILL BE DESIGNATED USING MASTER PAINTERS INSTITUTE STANDARD FINISH NUMBER NOMENCLATURE, TO BE PROVIDED.

- Coordinate painting systems with shop-applied primers specified in other Sections.

- A mockup of 2 ft. x 4 ft. shall be produced for each color.

- Semi-gloss paint shall be used for sheet rock walls. Block wall surfaces use semi-gloss paint. Finishes in high traffic areas shall be washable.

- A primer or block filler plus at least two finish coats systems shall be used on substrates.

- Low to no VOC paint shall be used.

- Specify field painting of exposed bare and covered pipes, ducts, hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment in this Section. Painting subcontractor shall paint this equipment, not the mechanical or electrical trades. Painting of mechanical and electrical work shall be limited to items exposed in equipment rooms and occupied spaces.

**PAINT SCHEDULE**

- All paint and coating systems shall be specified to meet or exceed the minimum requirements for LEED 2009 v3 environmental credit EQ 4.2. Submit product data with written documentation and printed statement of VOC content to demonstrate compliance.

- All paint systems shall be specified to be MPI of three coat systems (primer coat, intermediate coat and top coat) unless noted otherwise.
<table>
<thead>
<tr>
<th>Painted Surface Location</th>
<th>Substrate</th>
<th>MPI Paint System Number</th>
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<tr>
<td>Exterior</td>
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<tr>
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**EXTRA PAINT**

- One gallon of extra paint for each type and color or paint applied shall be furnished in manufacturer’s sealed shipping containers. Containers shall only be opened by the paint manufacturer/supplier to formulate required colors/mixes.
- The extra paint shall not to be used by the Contractor

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• Master Paint Schedule shall be included in close out documents to Owner

• Master Paint Schedule and paint container labeling instructions shall be as follows:
  • Place a label, protected by clear plastic on the lid of each container and the master
    paint schedule document with the following typewritten information:
  • Paint Manufacturer
  • Product name and number
  • Mixing and color formulation
  • Painting Contractor
  • Date that the paint container is put into Owner inventory
  • Room or area number where the paint applied was used
DIVISION 10 – SPECIALTIES

SPECIFY the following for SPECIALTIES

SIGNAGE

- A draft signage schedule shall be developed prior to completion of Design Development stage and requires Owner approval.

- **INDOOR SIGNAGE:**
  - The room numbers and names in the schedule shall match the room numbers and names on the drawings.
  - Once the final building layout design is complete CCSD will use Construction Documents to create the Permanent Room Numbering plan. The permanent numbering plan, matched to original plan numbers, will be provided to the designers. CCSD assigned Permanent Numbers are to be used in all final numbering of panels, and As-Built Drawings.
  - Signs to identify all rooms and spaces shall comply with ADA recommendations as to character proportion and color contrast. Signage shall also meet ANSI and ADA requirements for tactile characters and/or symbols.
  - The room number sign shall be permanently affixed.
  - Signs shall be mechanically attached to walls using concealed, corrosion resistance metal fasteners with tamper/vandal resistant one-way heads.
  - All signs shall have radius corners.
  - Room name and number signs shall be located on the wall adjacent to the strike side of the door and centered approximately 5’-0” above the floor. Where there is no wall adjacent to the strike side of the door the signs may be located on the doors.
  - Non-Restricted Use Rooms are considered flexible use and subject to change based on current needs. Therefore, the majority of rooms will be permanently designated on signage only by room number. Each room’s signage will contain the permanent room number and a 2” tall slot for an insert that allows the school to generate a description of the room’s use and occupant as appropriate. (Rooms such as classrooms, special education rooms, computer labs, foreign language, etc.)
  - Large gathering spaces shall be identified with signage that reflects its usage: GYMNASIUM, MEDIA CENTER, CAFETERIA, MULTIPURPOSE ROOM, AUDITORIUM, etc.
  - In Cafeteria, traffic flow directions shall be identified with signage that reflects desired traffic: ENTRANCE ONLY, EXIT ONLY, ORDER HERE, PAY HERE.
  - Dedicated rooms shall have room number and name that reflects its usage:, HEALTH, CUSTODIAL, etc. Evacuation signage in all spaces with a place for a chart insert.
  - Mechanical/Electrical/Utility/Fire Riser (dedicated) rooms shall have signage stating “NO STORAGE” on doors of closets smaller than 36” wide, 72” high. Signage for all Mechanical/Electrical/Utility closets shall include floor taping of areas in which storage is prohibited, following dimensions of IFC code.
  - Provide one sign each at gymnasiums, media center, cafeteria, multipurpose room, and auditorium to read MAXIMUM OCCUPANT LOAD – xxx (AE to verify number and mounting heights of signs).
Restrooms: In elementary and middle schools the signage shall have BOYS or GIRLS on group restrooms and MEN or WOMEN on public restrooms. In high schools the signage shall have MEN or WOMEN. Classroom restrooms shall be called RESTROOM. Faculty restroom shall be called FACULTY/STAFF RESTROOM.

Provide one sign for each stairwell with handicap graphic to read: (All stairs shall be numbered) STAIR #

Provide one sign in elevator telephone box that reads IN CASE OF EMERGENCY DIAL (XXX-XXXX). AE to verify telephone number.

**SPECIAL SECURITY SIGNAGE**

Security Signage is provided to assist first responders in the event of an emergency situation at an unfamiliar school building. A secondary but important value is to assist visitor navigation. All security signage is approved by the CCSD Security Director.

Each exterior doorway is to be numbered. The main entry is door 1 and every entry moving clockwise around the building perimeter is numbered sequentially. Numbering labels are fixed to the door in a manner so as to be easily read from the exterior.

Window labels corresponding room number are placed on each room’s far left of the left and right window in a manner so as to be easily read from the exterior.

A permanent graphic map is fixed to the wall at each key entry location showing the building layout and position of entry. (You are here)

Directional Way finding Signs are posted at key intersections to provide directions to specific areas of the building.

An Evacuation Map is provided for all spaces and is placed in a durable see through acrylic sleeve mounted on wall at the rooms exit. The map orientation is specific to the layout of the building when exiting the room.

Provide signs to read: SECURITY CAMERAS ARE IN USE, BUT MAY NOT BE MONITORED AT ALL TIMES. (Place at reception, vending, cafeteria, commons area, and any other room with security cameras).

Provide signs to be installed on the windows leaf of the main entrance pair of doors and at ALL entrance doors. Decal shall read:

Decal 1 (Leaf 1):

*NOTICE: PERSONS ENTERING THE CAMPUS ARE SUBJECT TO SEARCH PURSUANT TO SOUTH CAROLINA CODE 59-63-1110.*

Decal 2 (Leaf 2):

WELCOME ALL VISITORS ARE REQUIRED TO REPORT TO THE SCHOOL OFFICE

Provide sign to be installed on the office/reception door window.

Decals to read:

Decal 3:

OFFICE

SECURITY CAMERAS ARE IN USE, BUT MAY NOT BE MONITORED AT ALL TIMES.
• Provide two (2) signs to install on each telecommunication and facility security room. All telecommunications and facility security rooms shall be numbered. The numbers shall be coordinated with Owner project manager designee.

Sign to Read: MTR, TR#, or FSR
Sensitive Electronic Equipment No Storage Allowed

OUTDOOR SIGNAGE

• Post and panel signage shall be exterior, non-illuminated
• Provide sign outside on kitchen receiving door to read: KITCHEN RECEIVING – RING BELL FOR SERVICE

YARD SIGNAGE REQUIREMENTS

All yard signage shall be shown on a civil drawing showing quantities and locations. Consider combining key entrance, parking, and drop-off signs to suit the site traffic flow. NOTE SIZES SHOWN ARE MINIMUM: AE to review sizes with current code and adjust as required to meet code.

• 18 by 18 inch yard sign(s) shall read: STUDENT DROP-OFF AND PICK-UP AREA (Place at car entrance)
• 12 by 18 inch yard sign(s) shall read: BUSES ONLY (Place at bus entrance)
• 12 by 18 inch yard sign(s) shall read: NO PARKING SCHOOL BUS LOADING (AE to verify number and sign location).
• 12 by 18 inch yard sign(s) shall read: NO PARKING FIRE LANE (AE to verify number and sign location).
• 12 by 18 inch yard signs with handicap graphics shall read: RESERVED PARKING (AE to verify number and handicapped parking lot sign locations).
• 12 by 18 inch yard signs shall read: VISITOR PARKING (Place at visitors parking, AE to verify number).
• 12 by 18 inch yard signs shall read: FACULTY PARKING (Place at faculty parking, AE to verify number).
• 12 by 18 inch yard sign shall read: RESERVED FOR TEACHER OF THE YEAR (AE to verify number and parking lot sign location).
• 12 by 18 inch yard sign shall read: RESERVED FOR PRINCIPAL (AE to verify parking lot sign location).
• 12 by 18 inch yard sign shall read: RESERVED FOR SECRETARY (AE to verify parking lot sign location).
• 12 by 18 inch yard sign(s) shall read: RESERVED FOR ASSISTANT PRINCIPAL (AE to verify number and parking lot sign location).
• 18 by 18 inch yard sign(s) with right or left graphics arrow shall read: ENTRANCE (at main entrance).
• 30 by 30 inch reflective yard sign(s) shall read: STOP (at every vehicle exit).
• Require paint vehicular directional arrows at strategic locations, on the drives
• Require paint vehicular stop lines at every vehicle exits, on the drives.

SCHOOL LED MARQUEE
LED Marquee shall be located near the main school entrance and setback from the right-of-way in accordance with the County or City sign ordinances. In no case shall the sign be located within fifteen (15) feet of the right-of-way. Marquee Support Structure shall be of material and construction to match the school building.

**LED DISPLAY SHALL BE THE FOLLOWING**

- Daktronics Galaxy 34 mm Monochrome Outdoor LED Matrix Display 3500 is basis for design, unless not allowed by municipal ordinance. In such cases, variances will be granted on a case by case basis.
- Color Capability: 4,096 Shades
- Estimated LED Lifetime: 100,000 + hours
- 2-sided red LED (2 single sided displays)
- Matrix: 16 lines by 112 columns (minimum)
- Readable Viewing Angle: 120 degrees' horizontal x 50 degrees' vertical
- Viewing Angle: 90 degrees' horizontal x 40 degrees' vertical
- Contrast Enhancement: Non-reflective black louvers
- Graphic Capability: Text, graphics, logos, basic animations, multiple font styles and sizes
- Size of Displays: 3’4”H x 7’8”W x 8” D (minimum)
- External temperature sensor
- Communication Options: Wire Ethernet, Fiber Ethernet, Wireless Ethernet Bridge, Wi-Fi Ethernet
- LED Marquee Controller shall comply with the following
  - Software application with text and graphic displays with modules that allow you to create, schedule, and quickly change the content of your display.
  - Modules: Message editor, schedule editor, interactive commander, sign viewer, sign previewer, configuration editor, video manger, and on-line interfaces with information providers.
  - PC based Windows application with wireless capability

**DIRECTORIES**

- Way finding and office directories shall be provided that identify routes to different areas of the campus, i.e. office, auditorium, gymnasium, athletic fields, etc. and shall provide location and option for type to Owner for approval.

**VISUAL DISPLAY SURFACES**

- **Marker Boards**: all marker boards shall be magnetic type, provide flag holder brackets at the top of each marker board and map rail at the top of each unit. Porcelain enamel marker boards shall be
  - Balanced, high-pressure-laminated, of 3-ply construction, consisting of face sheet, core material, and backing.
  - Face sheet shall be porcelain enamel clad, stretcher-leveled aluminized steel.
  - Core shall be 3/8-inch particleboard.
  - Backing sheet shall be 0.015-inch thick, aluminum-sheet backing.
  - Aluminum pen tray with radius edges.

- **Tack boards**: shall be vinyl-fabric faced with mildew-resistant, washable vinyl fabric, laminated to ¼ inch thick cork sheet, and factory laminated to 3/8-inch thick fiberboard
backing. Mount to allow ½ inch behind the board for air flow. Metal trim and accessories for
all marker boards shall consist of extruded-aluminum. Finish shall be Class II, clear anodic
finish. Bottom of boards shall be no more than 34 in. from the finished floor.

- **Bulletin Boards and Display Cases:** Shall be manufacturer’s standard illuminated and non-
  illuminated for bulletin boards and glass display cases.

**CLINIC**

- Shall be launderable and flame resistant cubicle curtains.
- Fabrics shall be light tight and fade resistant.
- Curtain tracks shall be extruded aluminum, with satin anodized finish.
- Curtain carriers shall be one-piece nylon glides.
- Fasteners shall be stainless steel.

**LOUVERS AND VENTS**

- Architectural louvers shall be fixed, extruded aluminum with a high-performance coating finish
to match storefront system.
- Specify horizontal, drainable, storm resistant blades unless design dictates otherwise.
- Screens shall be ½-inch aluminum mesh, bird screening. Never specify insect screening at
  outside air intakes, as they clog frequently and require constant maintenance. If insect
  barriers are required, specify the proper filters and screening as part of the mechanical
  equipment.

**FLAGPOLES**

- Shall be ground-set, with base plate and foundation tube, cone-tapered flagpoles made from
  aluminum.
- Finish shall be clear anodized, Class 1 (0.7 mils).
- Shall be a height of 25 feet for the main school and 15-20 feet for the flagpoles at the
  stadium, baseball and softball fields. Each flagpole shall be required to withstand a 130 mph
  wind velocity.
- Shall have the following fittings:
  - Finial Ball: shall be Aluminum flush-seam, size to match pole butt diameter.
  - Truck: shall be ball bearing, nonfouling, revolving, double-track assembly for main school
    flagpole and single track for others.
  - Cleats: shall be two, 9-inch cast metal cleats with fasteners.
  - Halyards: shall be two continuous, external with lock for main school flagpole, single
    halyard for others.
  - Flag Snaps: shall be two swivel snaps per stainless steel or brass halyard.

**METAL LOCKERS**

- All lockers shall have sloped hoods.
- Corridor lockers shall be mounted a minimum of 12” off the floor to allow the floor underneath
to be maintained.
- Student Locker sizes shall be as follows:
o Student Corridor – 12” W x 15” D x 36” H, double tier

o Kitchen/Coach – 12” W x 15” D x 60” H, single tier

o For PE:

a. Box – 12” W x 15” D x 12” H, 5 tier

b. Wardrobe – 12” W x 15” D x 30” H, double tier

c. Team Lockers – 15” W x 15” D x 60” H, single tier

d. Women’s Varsity & all Jr. Varsity – 18” W x 18” D x 60” H, single tier

e. Men’s Varsity – 24” W x 18” D x 60” H, single tier

FIRE-PROTECTION SPECIALTIES

• Specify portable fire extinguishers. Mounting brackets and fire extinguisher cabinets to comply with NFPA 10. Fire extinguishers shall be in recessed cabinets.

• Fire extinguisher locations and coverage shall be based on Multi-purpose dry-chemical type, UL-rated 4-A:60-B:C, 10-pound capacity. Carbon dioxide type shall be UL-rated 10-B:C, 20-pound capacity.

• Fire extinguishers in mechanical rooms and other services spaces shall be wall mounted with bracket. Provide cabinet types in all other locations to suit fire extinguisher type.

• Fire extinguisher cabinets shall be mill finish aluminum and recessed. Specify recessed cabinet, with exposed flat trim, in walls of sufficient depth. Provide semi-recessed cabinet, with 2-1/2 inch rolled edge trim, in walls of shallow depth. Provide surface mounted cabinet, mounted directly on wall, where it is impractical to recess, such as concrete walls. Fire extinguisher to be Contractor furnished and installed to comply with NFPA10.

• Identify fire extinguisher with silk-screened, vertical letters, applied to the cabinet glazing.

• Fire extinguisher cabinets are to be numbered in consecutive order with engraved three-layer laminated plastic, black letters on white background. Nameplates are to be installed on all fire extinguisher cabinets and wall brackets. Program Management shall approve numbering system.

PRE-ENGINEERED WALKWAY COVERS

• Walkway covers shall be aluminum, consisting of extruded aluminum posts, beams and roof deck panels. Deck screws shall be stainless steel, sealed with seals and washers as recommended by manufacturer. All components shall be from one source from a single manufacturer.

• Specify canopy system to be engineered and fabricated to withstand the design loads indicated on the structural drawings to meet the code requirements for the Project. Submit professional engineer’s certificate.

• Canopy system shall incorporate an external drainage system for discharge at the ground level.

• Finish on all exposed components shall be a fluoropolymer 2-coat system. Color shall match storefront system, when used. Verify color selections with Owner.

• Extended drains shall tie in and terminate to underground storm drainage system. DRAINAGE SHALL NOT DISCHARGE ONTO SIDEWALKS.

OPERABLE Wall Systems
• Operable Wall Systems shall only be used between the cafeteria/cafetorium and a multi-purpose room.

• Panel wall shall be constructed of welded steel 3 ½ in thick with minimum 16 gauge steel face sheets with panel weight not to exceed 10 lbs. per sf

• Suspension Tracks shall be steel or aluminum with adjustable steel hanger rods.

• Panel walls shall be primed steel, fire-resistant, manually operated, individual panels with mechanically operated top and bottom sound seals. Panels shall be sealed such that acoustical performance minimum requirement of STC 53 is met.

• Provide manually operated bottom seals.

• Trolley load limit must be 50% higher than the maximum weight of the panel.

• Drawings shall show field-assembled wall above the wall panels to maintain the STC rating from top of wall panel to underside of deck. Indicate all joints in the wall to be sealed and any accessories such as pass doors and marker boards. Coordinate requirements for overhead structure with the structural drawings. Verify that the support beam flange is wide enough for the panel manufacturer’s support brackets.

ACCORDION FOLDING PARTITIONS

• Specify accordion folding partitions, in lieu of operable wall panels, when room separations are frequent. Pass doors and wall accessories are not required. Set up shall be quick and easy.

METAL STORAGE SHELVING

• Manufactured shelving shall be an open style with front box posts, rear angle posts, metal shelves and sway bracing. Metal shelving shall be used in all custodial areas, lawn equipment storage, elementary school playground yard storage, A/V storage, and textbook storage areas and/or as specifically identified in the Educational Specification.

• Basis of Design product for metal storage shelving shall be Clipper Open Storage Units by Penco, or a comparable product. Unit size shall be 36” to 48” wide, 12” to 18” deep and 87” high. (Width and depth shall vary within this range to meet the requirements of each application.)

• Shelf label holders shall be provided

• Posts and beams shall be fabricated from cold-rolled steel.

• Finish shall be standard gray finish enamel.

TOILET, BATH and LAUNDRY

Toilet Compartments

• Group toilet partitions, urinal screens (if required), and doors shall be solid dark color phenolic.

• Toilet partitions and doors shall be floor and ceiling anchored or overhead braced. Prefabricated toilet partitions and metal partitions are not permitted. Toilet partitions shall be secured with vandal resistant stainless steel machine screws with expansion anchors at masonry and tile walls and with solid blocking at hollow walls and expansion anchors at other walls. Provide stainless steel or polymer resin base trim to conceal floor anchorage and leveling devices.

• Provide continuous brackets to support compartment panels to each other and to the wall.
Hardware shall be stainless steel. Specify continuous hinges on stall doors. Door hinges shall be self-closing at all locations. Provide rubber-tipped coat hook/bumper on each stall door.

Urinal screens, if required, shall be provided between adjacent urinals and located next to lavatories. If used, screens shall be floor and ceiling anchored or overhead braced.

Partition, door and screen components shall be of the same construction and materials.

ACCESSORIES

Toilet accessories manufacturers shall be as shown in the Appendix A “Preferred Manufacturers” no deviations are allowed – furnished and installed by the Contractor.

Typical accessories include, but are not limited to the following. The schedule and drawing designation follows each item:

- Paper Towel Dispenser: PTD
- Waste Receptacle: WR
- Toilet Tissue Dispenser: TTD
- Foam Soap Dispenser: FSD
- Sanitary Napkin Disposal Unit: SNDU
- Grab Bar: GB
- Shelf Unit: SU
- Mirror Unit: MU
- Shower Curtain Rod: SCR
- Shower Curtain: SC
- Folding Shower Seat: FSS.
- Hook Strip: HS.
- Robe Hook: RH.
- Mop and Broom Holder: MBH.
- Warm-Air Dryer: WAD.
- Under lavatory Guard: UG
- Infant Care is Project specific

LAUNDRY

Athletic laundry equipment for high schools shall include a 60 pound capacity washer-extractor and a 75 pound capacity dryer. Design to 1 set per 1000 student ratio. The athletic washer and dryer shall require access either direct or via hallway with double door entrance for installation and maintenance.
DIVISION 11 – EQUIPMENT

SPECIFY the following for EQUIPMENT

FOOD SERVICE EQUIPMENT

• Coordinate food service equipment requirements with Owner Food Services. Owner and Owner food service Director shall approve food service consultants and the specific project requirements. Kitchen Equipment and schedules shall be developed based on the approved equipment shown in the Appendix A “Preferred Manufacturers” no deviations are allowed.

• Provide separate Food Service drawings for equipment locations and schedules.

• Specify requirement for coordination drawings to include service utility characteristics.

• Specify requirements for operation, maintenance, and parts data.

• Specify startup and testing requirements for food service equipment.

• Kitchen exhaust hoods, fire-extinguishing systems, fire alarms and disconnects are specified in Divisions 21, 22, 23, 25, and 26.

• Specify a hose bib, reel and floor drain shall be provided in kitchens for the purpose of floor cleaning.

• Sound system for the Cafetorium shall include two full range column array loudspeakers, one mixer amplifier with dual 70 volt amplifiers, one compact disk player, one wireless microphone system with hand held transmitter with 300 ft. line of sight capability and one rack mounted A/C power distributor. See Appendix A “Preferred Manufacturers”.

MIDDLE/HIGH SCHOOL FOOTBALL STADIUM

• Sound System shall include 2 full range weather proof and wind resistant speakers, one voice range weather proof long throw horn loudspeaker mounted to poles, one dual channel amplifier with 70 volt transformer outputs, one single rack space mic/liner mixer and one desktop announcers “push to talk” microphone. See Appendix A for Preferred Manufacturers

GYMNASIUM EQUIPMENT

• AED (Defibrillators) and cabinets shall be Owner furnished, Contractor installed. Installation shall be ADA compliant.

• Athletic equipment shall be aluminum or corrosion resistant steel. Materials shall be factory painted, baked-enamel, and powder-coat finish.

• Anchors, fasteners, fittings, and hardware shall be manufacturer’s standard corrosion-resistant or non-corrodible units; concealed tamperproof, vandal and theft resistant.

• Mounting pads shall be wood, neutral color painted finish.

• Specify deployable gymnasium floor covering with holding rack. Covering shall be 32 oz. or greater, 3 ply, resilient reinforced polyester in a single color.

GYM DIVIDER

• Divider curtains shall be the motorized type using electric power.

• Lower section shall be solid vinyl coated polyester

• Upper section shall be VCP woven mesh.
• Provide anti-bacterial and fungi-resistant treatment.

• Provide heavy duty galvanized steel track, beam clamps, and hanger brackets.

• Carriers shall be 1-1/8 inch diameter nylon tire ball bearing wheels, spaced approximately 12-inches on center.

• Provide tieback straps to secure curtain to wall when not in use.

WALL PADS

• Installed around all walls in wrestling room/practice rooms and on gymnasium walls underneath the goals.

• Wall pads shall be 2-inch thick, 3.5-pound density polyurethane foam bonded to a 7/16-inch thick waferboard, fully wrapped with vinyl coated polyester covering.

• Provide “Z-Clip” attachment at the top of each pad.

LED DISPLAYS

• Specify (2) two Daktronics Model BB-2103-13 LED display scoreboards be mounted on wall in main gym of middle and high schools. See project OPR if Daktronics Model BB-2103-13 is discontinued.

• Boards are to be operated by a wireless control panel.

• Provide a wall mounted, keyed power switch for scoreboard. All cables, accessories, horns, logos, etc. are to be provided.

BASKETBALL

• The High School main competition basketball backboard for high school gymnasiums shall be not less than ½” thick transparent, tempered glass, 72 by 48 inches width by height, with painted markings and rim-restraining devise.

• The Middle School and Elementary Schools backboards shall be 1-1/2 inches thick composite board fiberglass, 72 by 48 inches width by height, with rounded corners, white background and required markings.

• Provide fixed, non-movable, single-rim basket ring competition goal, with no-tie loops for attaching net to rim without ties.

• Supply nylon, 12-loop-mesh nets between 15 and 18 inches long. Indoor backboards shall have bottom and side edge protective padding.

• Main interior basketball blackboard mounts shall have safety strips (ASTM standards) only retractable installations.

• Gym equipment shall comply with FIBA International Basketball Federation and NFHS National Federation of State High School Associations.

• Exterior basketball courts shall have (2) two outdoor backstops. Include permanent ground installation in concrete base. In Elementary Schools, provide fixed height basketball goals at 8 feet.

• Sound system shall include six full range loudspeakers, one dual 15” subwoofer with fly points, one dual channel amplifier with 70 volt transformer outputs, one dual channel power amplifier, and one single rack space mic/line mixer. See Appendix A for preferred manufacturers.

VOLLEYBALL
• Volleyball equipment shall include a chrome-finished steel floor plate and inserts removable, paired post standards with adjustable, telescoping height.
• Net shall be 32-feet long with a net tensioning system.
• Volleyball net shall be adjustable between 8 feet and 5 feet to allow volleyball or badminton use.
• Include all accessories for a complete installation.
• Provide wall storage hooks for mounting on wall to store game standards.

**BASEBALL, SOCCER, FOOTBALL**

• Specify (2) two Foul poles for both baseball and softball fields.
• Specify (2) two soccer goals with tip-over proof anchors for new construction.
• Specify (2) Football goal posts shall be provided if a new field is constructed.

**GAME LINES IN THE ELEMENTARY SCHOOL MULTIPURPOSE ROOM**

• Set out of bounds lines shall four feet from the walls.
• Set adjustable basketball goals directly above the out of bounds lines.
• Provide 15’ from the foul line to the basketball backboard.
• Set remaining lines shall be in accordance with recognized game and age group standards.

**PROJECTION SCREENS**

Uses of projector screen shall be limited to large spaces (not for classrooms) and conference spaces. Projection screens shall be:

- Wall or ceiling mounted
- Front-projection screens
- Manually operated (Electrically operated screens, if required for the project, require Owner approval.)
- Viewing surface shall be vinyl-coated glass-fiber fabric with gain characteristics complying with FS GG-S-00172D (1) for Type C screen surface.
- Edge treatment shall be black masking borders. Screen size shall be per Education Specification or as indicated in the project OPR. OPR takes precedence in instances where both specify sizing.
- Screen pull rods shall be provided to reach pull bails on screens mounted out of reach.
- Electrically operated screens (if approved by Owner) shall be UL-labeled units, with 3-position control switch for flush wall mounting. Unit shall have motor in roller with permanently lubricated ball bearings.

**LOADING DOCK EQUIPMENT**

Loading dock equipment shall include dock bumpers, dock levelers, and truck restraints and a dock plate installation.

**RESIDENTIAL APPLIANCES**

All residential appliances (kitchen, microwave, refrigerator, laundry appliances) in staff lounges, employee and student break rooms, health rooms and home economics classrooms shall be electric operated, Energy Star rated and the color white.
LABORATORY FUME HOODS

- Fume hoods shall be limited to science labs in high schools. Locations and sizing shall be per Education Specification or as indicated in the project OPR. OPR takes precedence in instances where both specify locations and sizing.
- Coordinate the fume hood selection with the mechanical equipment.
- Coordinate the work surface selection with Division 12 Section “Laboratory Casework.”
- Coordinate safety device requirements and locations with the fume hoods.
- Airflow indicators and alarms shall be in accordance with NFPA 45.
- All new construction shall have ramp access to stages in auditoriums and cafeterias – no chair lifts are permitted.

STAGE CURTAINS

- Fabrics shall be permanently flame resistant or chemically flame resistant with documentation to be included in close out documents.
- Woven cotton shall be velour curtain products
- Shall be Fifty percent (50%) fullness exclusive of turn backs and hems.
- Color shall be as required for the specific project requirements.
- Fabricate steel-tract channels from roll-formed galvanized steel, minimum metal thickness to be adequate to hold 200% of curtain weight and provide seismic restraint.

EQUIPMENT BUDGET GUIDANCE

The following table is a list of equipment for reference only, and identifies a partial list of items that are furnished to the Project by either the Construction or the FF&E budget lines. All equipment shall be specified to meet EPA Energy Star standards where applicable.

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<th>CONSTRUCTION BUDGET (Cost Account 1.0)</th>
<th>FF&amp;E BUDGET (Cost Account 5.0)</th>
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<td>Eye wash stations w/shower (clinic &amp; science)</td>
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<tr>
<td>First aid kits (mounted)</td>
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<td>Item</td>
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<td>Kitchen equipment</td>
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<td>Knox box fire key access</td>
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<td>Lockers</td>
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<td>Mirrors</td>
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<td>Signage (interior/exterior)</td>
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<td>Staff mail boxes</td>
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<td>Washer/dryer</td>
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<td>Flammable storage cabinets</td>
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<td>SCETV equipment</td>
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<td>Refrigerators for Home Economics</td>
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<td>US Mailbox (Contractor Installed)</td>
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Charleston County School District
Design Requirements for New Construction and Major Renovation
Release #03 - June 2016. Revisions to the text from the previous version are underlined and logged in Appendix B.
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<td>Stoves/ranges</td>
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DIVISION 12 – FURNISHINGS

Division 12 – Furnishings remains under development by Owner personnel at this time. AE’s are encouraged to provide comments and suggestions for this division during their review.

AUDIENCE SEATING

- Consult with CCSD for fabric color and type prior to specifying
- Chair Envelope (Closed Depth): To maximize seat capacity and egress the closed depth shall not exceed 15.5”.
- Steel Stanchions: Minimum 14 gauge and 1/4” steel plate foot. Black Powder Coated.
- Inner Back and Seat Frames: Tubular Steel. Plywood or plastic inner structure is not acceptable. Serpentine springs are unacceptable.
- Back Foam: 5” thick at Lumbar, 2” thick at top.
- Seat Foam: 4.5” thick. cold-cured sculptured molded.
- Aisle Panel: 3/4” Plywood core with finished veneer outer surface with louver top to conceal aisle light in panel.
- Aisle Lights: To be housed in top portion of aisle panel beneath wood louver, protected from contact & collision.
- Fixture to be UL listed, low voltage, 9 LED deluxe warm white bulbs.
- Armrests: Solid Injection Molded Polyurethane, Black. Armrest security screw required.
- ADA Transfer Panel: Swing away panels. Panels to match all aisle panels and have ADA label.
- Row Letters & Seat Numbers: Black Polymer with white letters. Snap into tamper proof receptacle. No rivets, brads or glued on plates.
- Warranty: 5 year standard warranty on metal, foam, plastic. Steel stanchion warranty 15 years.
- Attic Stock: 1% of Total number of installed chairs.
- Sample: Provide Sample Meeting Specification.
DIVISION 13 – SPECIAL CONSTRUCTION

Division 13 – Special Construction remains under development by Owner staff at this time. Included below are the items covered under this division. AE’s are encouraged to provide comments and suggestions for these items during their review.

- Walk-in Freezer
- Walk-in Refrigerator
- Weight Room
- Stadium Seating
- Vault
- Mobile Classrooms
- Special Structures
- Sound conditioned rooms (band/performance rooms)
- Kiln Rooms
- Athletic Rooms/Weight Rooms
- Greenhouses
- Metal Building Systems
- Metal Towers (band fields)
DIVISION 14 – CONVEYING SYSTEMS

SPECIFY the following for CONVEYING SYSTEMS

HYDRAULIC ELEVATORS

- Hydraulic freight cargo type elevators shall be used for service and passenger applications. Traction and electric elevators are not permitted.
- All elevator equipment and diagnostic systems shall be non-proprietary.
- Elevators shall be full size cabs (7’0" W x 5’6" D) with a rated load of 3000 lbs.
- Elevators shall comply with the latest edition of ASME A17.1, including recent amendments.
- Shop drawings shall show the project specific machine room layout drawn to scale (not the manufacturer’s typical machine room layout) for the building. If modifications to the Contract Documents are required to comply with the Code and/or the elevator manufacturer’s requirements, the changes shall be clearly shown on the shop drawings. The final machine room layout, required to meet the elevator code, is the elevator manufacturer’s responsibility. If installation results in violations to the elevator code, the Contractor shall be responsible for field corrections at his own expense.
- The elevator manufacturer shall provide signed documents certifying that hoistway, pit and machine room layout, including door location, size and swing, locations and dimension of all wall mounted electrical devices and services, as shown in the Contract Documents, are adequate for the elevator system being provided.
- The Installer shall be an authorized distributor of the equipment to be installed, have 5 years prior experience, have a local service office and a staff of qualified technicians. Specify a warranty period of 12 months and a 12-month maintenance service contract beginning at Substantial Completion.
- The Installer shall comply with manufacturer’s installation instructions and the approved shop drawings. Drill excavation to accommodate plunger-cylinder units in well casings; fill void spaces between cylinder casing and cylinder with corrosion protective filler, or fine sand. Install plunger-cylinder units plumb and accurately centered. Set sills flush with finish floor surface at landings.
- Sump pumps shall be provided in all elevator pits. Pump units shall be submersible type.
- Operating System shall be a microprocessor and provide battery-powered lowering if power fails.
- Hoist way entrance doors and frames and car doors shall be satin stainless steel finish. Wall finishes shall be 16-gauge Steel, powder coated to Owner’s color specification.
- Handrails shall be #4 Stainless Steel ½” x 4” two per wall on all walls.
- Key switch control shall be provided in addition to standard activation.
- Emergency communication systems shall meet ADA requirements. Provide a sign at the elevator telephone to state: In case of emergency dial the elevator central station monitoring center. Coordinate number with Owner. Specify fire fighter’s service.
- Contractor shall supply elevator pads and hooks for protection.
DIVISION 21 - FIRE SUPPRESSION SYSTEMS

SPECIFY the following for FIRE SUPPRESSION SYSTEMS

- AE shall locate sprinkler/fire pump rooms on the ground floor with exterior access.
- Use wet pipe sprinkler systems throughout all structures wherever allowed by code. A request to use dry pipe systems in areas not required by code shall be submitted in writing to Owner with a clear explanation of why they are necessary for the specific application and shall be approved by Owner prior to proceeding with the design.
- All out buildings, including sporting event support structures (press box, concession stands, restroom facilities, etc.) shall be designed to avoid the need for automatic sprinkler protection whenever possible. This shall include, but not be limited to, type of construction, height, separation, compartmentation, etc.
- The AE shall be responsible for obtaining local water system information and coordinating flow test with the local water company and Fire Chief. Fire pumps shall be approved only after providing appropriate supporting calculations and meeting with the local fire department to assess their capabilities and equipment.
- Hydraulic Analysis shall show calculated demand and minimum required water supply required.
- Emergency power supplies for fire pumps or engine driven fire pumps shall only be provided where required by the AHJ or code due to an inadequate or unreliable power source from the utility company serving the Project.
- Manufacturers of products shall be based on the Preferred Manufacturers shown in the Appendix A “Preferred Manufacturers” no deviations are allowed.
- Art kiln rooms shall be equipped with a smoke/heat detector and sprinkler head as required by code.
DIVISION 22 – PLUMBING

SPECIFY the following for PLUMBING

Manufacturers of products shall be based on the Preferred Manufacturers shown in the Appendix. A “Preferred Manufacturers” no deviations are allowed.

PLUMBING GENERAL REQUIREMENTS

- All water consuming devices shall exceed minimum IPC requirements by at least 20%.
- Provide floor drains with trap primers at or near water heaters, dishwashers, emergency showers, teacher lounges, nurse offices, single fixture toilet rooms, media centers with attached kitchens and break areas, and CD classroom near sinks.
- Specify underground and under slab DWV piping as Cast Iron.
- Provide positive freeze protection on all water lines subject to freezing conditions.
- A ball valve shall be included in branch piping to all exterior hose bibs. Where suitable, hose bibs shall be located adjacent to exterior mechanical rooms, dropping branch piping exposed in mechanical room and locating ball valve a maximum of 6 ft. above the finish floor. When the hose bib does not align with a mechanical space on the exterior of the building, the ball valve shall be above an accessible ceiling near the exterior wall and the ceiling grid shall be appropriately marked as to the location of the valve.
- Specify maximum distance of 80 feet of pipe between cleanouts for toilet waste lines. Cleanouts to be accessible from interior of building. Cleanouts to be both at beginning and end of lines.
- All new and existing sanitary drainage systems and storm drain systems to the point of service connection or termination outside the building footprint for storm drainage shall be completely cleared with a plumber’s snake and flushed after a building is completed and prior to Substantial Completion.
- Tempered water shall be provided only in areas required by OSF and the plumbing code including, but not limited to: kitchen, early childhood, kindergarten, Grade 1, and special needs classrooms.
- Nurses’ clinics and lounges shall have stand-alone tank style water heaters for tempered water located near fixtures to avoid need for a recirculation pump. These two areas should not be connected to the building’s hot water loop.
- Pending funding availability, Teacher’s Rooms shall have a separate toilet for staff.
- Chrome escutcheon rings shall be used at all exposed ceiling and wall penetrations.
- Isolation valves shall be used in cold water and hot water mains and branch piping so that water can be shut off to each classroom wing, administration area, group toilets, and science classrooms.
- Require Contractor to provide video documentation of pipe interior of all below grade DWV Systems under building slab and on site to the point of service. Video shall document continuous slope and proper drainage (no dips, no crowns). Video should show all mains and branch connections as well as continuous measurement of pipe length.
• Require Contractor to provide photographic documentation of locations (including burial depth) of all below grade water and DWV systems under slab and on site to the point of service.

• Video and photographs are to be included in project closeout documentation.

• Utility Meter shall be located at property line and/or right of way line in non-traffic area.

• Secondary water meters shall be added for cooling towers, mechanical system make up water and irrigation systems. These shall separate from main building service in order to avoid sewer charges. All water meters shall be connected to the BAS for monitoring and alarm capability.

• The cost of providing the water services, taps, meters, and vaults/boxes shall be part of the Contractor’s responsibilities in the Contract Documents.

• Backflow preventer shall be located with the fire riser/main domestic water riser, located inside the building, directly accessible from the exterior.

• Jumbo roll toilet paper dispensers shall be located in a wall recessed, open faced stainless steel cabinet that runs from the floor to 1.5 inches below the horizontal grab bar. It shall be sized so that the toilet paper can easily be changed.

PLUMBING IDENTIFICATION

The following identification system shall be used:

• Paint and code all exposed piping in mechanical and boiler rooms with stencil paint, manufactured stick on or wrap around systems. Piping shall have flow arrows and labels located at 10 ft. intervals, at all turns and at each floor or wall penetration:

• Locate and color code pipe markers and flow arrows as follows:
  o Maximum of 25 ft. and closer if congested
  o Near each change in direction
  o Near each valve
  o Near each branch
  o Near equipment
  o Near origination and termination points
  o Near where pipe passes through walls (on both sides of wall)
  o Near access doors
  o Cold Water – dark blue
  o Hot Water – dark red
  o Gas Lines – Yellow
  o Ceiling valve marker for valves shall be located above and below lay-in ceilings. Attach valve marker to adjacent ceiling grid.
  o Above ceiling valve markers: ½ inch diameter self-adhesive color-coded circle. Color code as listed above for system served.
  o Below ceiling valve markers: Engraved Phenolic Plastic Nameplates, ¾” tall black surface with ¼” tall white lettering
PLUMBING FIXTURES

- Main domestic water heaters shall be located on ground floor on a slab. Any room containing water heaters shall have a minimum installed clearance recommended by manufacturer. Doorways in rooms with water heaters shall have a minimum clearance of the width of fixture plus 6 inches to replace water heaters.

- Specify vandal-proof options for all fixtures used by students. This includes but is not limited to: handle screws, aerators, showerheads, and water coolers.

- Water closets shall be floor mounted. Specify floor mounted elongated bowl water closets.

- Dimension all floor drain locations on drawings.

- Washer box shall be for all residential type washing machines with cold water, hot water, and drain for both commercial and residential use.

- Shower valves shall have single handle, scald proof control.

- Urinal and water closet flush valves shall be manual type angle control-stop valve with vacuum breaker. Bathroom sink faucets shall be vandal resistant metering type. Faucets with handles or wrist blades are required for lab sinks, art rooms and kitchens. [Optional: Specify hands free, hard wired, electronic flush valves and mixing faucets throughout the building for all water closet flush valves, lavatories, and hand washing sinks.]

- Specify mop sinks with stainless steel wall protection on all sides. Floor mounted mop sinks shall be pre-cast stone and wall mounted mop sinks shall be cast iron.

- Fixtures in class rooms shall have faucet necks centered over the drain hole of the sink.

- Provide clay traps in art room sinks.

- Provide group or multi-user wash fountains in group toilets.

- Specify single water cooler with bottle filling station

- Show on drawings a freeze proof yard hydrant on a pedestal on the roof within 50 feet of any roof mounted HVAC equipment that shall require routine indoor and outdoor coil cleaning.
DIVISION 23 - HEATING, VENTILATING & AIR-CONDITIONING

SPECIFY the following for Heating, Ventilation & Air-Conditioning

EQUIPMENT LOCATION / ACCESSIBILITY / SERVICE

Specify the location and accessibility of HVAC equipment as follows:

- Equipment and systems shall be designed and located so that Owner personnel may conduct routine maintenance with minimal interference to the daily operations of the facility.
- Mechanical closets accessible from hallway shall be used to house water source heat pumps.
- All HVAC equipment shall be installed per manufacturer's recommended clearance guidelines with sufficient space for maintenance personnel to change filters and pull coils.
- Equipment shall not be located in ceilings or in areas where a ladder is required for access or height presents obstacles to maintenance.
- Roof mounted equipment shall be designed and located so that fall protection is not required and be accessible by a full-sized staircase or elevator. In buildings with pitched roofs, equipment shall be located under the roof and in conditioned attic spaces accessible by stairs. The design must allow for removal of equipment without modifications to the building structure. Ladder access to units in attics is not permitted.
- Condensate floor drains shall be accessible from the front of the unit.
- Expansion tanks shall be bladder type.
- Equipment, mechanical and electrical rooms shall provide consistency in layout and service requirements. A lay out shall be provided to CCSD for review and approval prior to fabrication or installation.
- Quick disconnects shall be used on all power, water, control and duct connections.
- Cooling Towers: shall be located on the ground unless impractical and/or prohibited by the BAR.
- Boilers and Loop pumps shall be located in the main mechanical room, which shall be located adjacent to cooling towers.
- MTR and Security Systems: Shall be located in separate but adjacent rooms. No piping to be installed above MTR room.

EQUIPMENT SELECTION and SIZING

- The following Climatic Design Information shall be used for the design of all HVAC systems (Based on ASHRAE Handbook of Fundamentals, 2013 Edition, Chapter 14, Climatic Design Information for Charleston, SC):
  
  o Summer: 92.1 Dry Bulb Degrees F, 77.6 Mean Coincident Wet Bulb Degrees F (ASHRAE 1% Condition)
  
  o Winter: 27.3 Degrees F Dry Bulb (ASHRAE 99.6% Condition)

  o Summer outdoor air dehumidification for ventilation: Outside condition: 78.9 Dew Point Degrees F, 84.4 Dry Mean Coincident Dry Bulb Degrees F (ASHRAE 0.4% Condition). Note outdoor ventilation air shall be cooled and dehumidified to approximately 48 to 50 Degrees F Dew Point Degrees F by dedicated outdoor air units before delivery to the occupied spaces. In the winter the entering outdoor
Air shall be heated to approximately 65 to 70 Degrees F Dry Bulb before delivery to the occupied spaces.

- All HVAC Equipment shall be Water Source Heat Pumps (WSHP's) for space temperature control and Dedicated Outdoor Air Systems (DOAS) for pre-conditioning outdoor air for ventilation.

- All loop piping systems shall be designed with isolation valves provided to provide isolation capabilities per floor and per wing shutdown. Valves shall be designed as gate valve type only. Valves shall be labeled below and above ceiling with phenolic tags.

- Separate Sidestream filters shall be provided for all Cooling Tower basins and for all Water Source Heat Pump loop piping systems at each school.

- Sidestream filters shall use the centrifugal separation principle of operation and shall operate continuously when systems are operating.

- Sidestream filters shall be selected for 10% of the system’s total flow (10% Basin Pump flow for cooling tower basins and 10% of the loop water pump flow for the loop side of the system) and shall be selected to filter particles from the system that are 10 microns in size or larger.

Evacuation of separated solids shall be accomplished automatically by the use of an electrically-actuated purge valve programmed at appropriate intervals and duration in order to efficiently and regularly purge solids from the separator's collection chamber. The purge pipe shall discharge into the nearest floor drain. This valve shall be monitored and controlled by the Building Automation System.

- All units shall have standard 24-volt control circuit and web based controls capability.

- Provide BACnet building automation system interface between manufacturer’s unit controls and Owner’s BAS. Interface shall provide Owner’s BAS access and ability to manipulate all of manufacturer’s adjustable set points and alarms.

- All units shall be constructed of copper or aluminum tubing and aluminum fins for coil construction.

- Water Source Heat Pumps (WHSPs) shall be specified as high efficiency (Minimum 18 EER at standard ARI conditions) using R410a. No auxiliary heat other than the heat pump operation shall be provided for winter time operation.

- Load match pump and piping systems should be considered to reduce cost and operation of hydronic system.

- All coils receiving outdoor air (air cooled condensing units, dedicated outdoor air unit coils handling 100% outdoor air, etc.) shall have a factory applied, industry standard seacoast coil coating. Application shall ensure entire coil and fin surface are coated and shall take place during manufacturing process and not on site.

- Multiple compressor units shall utilize multiple independent refrigerant circuits.

- All units equipped with semi-hermetic compressors shall have oil protection.

- Penetrations thru the sidewalls shall have proper sleeve and properly sealed.
All refrigerant lines shall be appropriately sealed when installed and charged with nitrogen after installation, during construction and prior to start-up.

Designs shall minimize refrigerant line set length on split systems.

Sewer vents shall be located at least the minimum code required distance from any fresh air intake.

Direct drive equipment with variable speed drives shall be used for most air handling fans. Any units with belt drive systems shall include a requirement that an extra belt be provided at closeout.

Specify one extra fuse be provided in each disconnect at closeout. Electrical disconnects shall be non-fused unless otherwise required by the electrical code.

All 3-Phase equipment shall have phase loss / brownout protection.

All refrigerant systems shall have low and high-pressure switches, not a loss of charge switch.

Do not mount disconnects on any equipment access cover or obscure any unit nomenclature or nameplates.

All control transformers shall have separate internal fuses or circuit breakers with manual resets.

Variable speed drives shall be specified on all pumps and fans with motors greater than or equal to 5 horsepower.

**COOLING TOWERS (CT)**

Two closed circuit evaporative coolers shall be provided for loop water heat rejection.

Evaporative coolers with standard coils shall be sized for two cells at 35% or optional 50% of the building’s block load or the simultaneous peak load considering diversity to provide partial redundancy. Variances from this requirement require AE to provide calculations and narrative explaining design rationale. AE must receive Owner approval for any variances from this requirement.

The block load shall be the maximum simultaneous load the water loop is expected to see at any one time during the year and shall be based on an 8760 hour per year software based energy and HVAC load analysis of the facility based on the set points and operating schedules expected at the Project.

Evaporative coolers casings, pans, hardware and fasteners shall be of all stainless steel construction (fiberglass shall not be accepted). Heat exchanger shall be either stainless steel or galvanized steel (G180 type).

Open towers, plate and frame heat exchangers and primary/secondary pumping arrangements are not allowed.

Separate Sidestream filters shall be provided for all Cooling Tower basins and for all Water Source Heat Pump loop piping systems at each school.

Sidestream filters shall use the centrifugal separation principle of operation and shall operate continuously when systems are operating.
• Sidestream filters shall be selected for 10% of the system’s total flow (10% Basin Pump flow for cooling tower basins and 10% of the loop water pump flow for the loop side of the system) and shall be selected to filter particles from the system that are 10 microns in size or larger.

• Evacuation of separated solids shall be accomplished automatically by the use of an electrically-actuated purge valve programmed at appropriate intervals and duration in order to efficiently and regularly purge solids from the separator’s collection chamber. The purge pipe shall discharge into the nearest floor drain. This valve shall be monitored and controlled by the Building Automation System.

• On major renovation projects or capital maintenance projects, only when no energy model exists, Evaporative Coolers shall be sized based on industry standard diversity factors such as those found in the Daikin/McQuay (Example, not required to use Daikin/McQuay equipment) water source heat pump design guidelines. In no case shall Evaporative Coolers be sized based on the total connected heat of rejection load of all equipment connected to the loop. This requirement to use system diversity in central equipment diversity shall also apply to the sizing of loop water pumps, system water heaters/boilers, pumps and piping mains.

• All CTs shall have two direct driven, variable speed fans and two motors with variable speed drives and two independent tower spray pumps independently controlled. All CT VFDs, control relays, contactors shall be located in the mechanical room.

• All CT shall have ladder and access platforms for maintenance and service. All CTs shall be specified with a swing arm hoist rated (for weight) to maintain all components of tower.

• A Water meter shall be installed on tower feed water and connected to the BAS. Once an expected average evaporation and bleed flow rate is established, an alarm shall be set to notify when flow rate is exceeded for more than 15 minutes any time throughout the year. Provide electronic flow meters on all water source heat pump loops connected to the BAS and displayed on the BAS system graphic.

BOILERS

• Facility shall have two (2) high efficiency gas fired, fully modulating condensing Boilers

• Boilers shall be required to be ASME pressure certified.

• Boilers shall be sized at 60% of the Block design heat load to add heat to the water loop. See notes regarding diversity sizing of Cooling Towers above. Variances from this requirement require AE to provide calculations and narrative explaining design rationale. AE must receive Owner approval for any variances from this requirement.

• The total capacity of the Boilers shall not be greater than 75% of the total connected heat of absorption of the equipment connected to the loop and in most cases can be substantially smaller (as small as 25% of the total connected heat of absorption). Variances from this requirement require AE to provide calculations and narrative explaining design rationale. AE must receive Owner approval for any variances from this requirement.

• Provide BACnet building automation system interface between manufacturer’s unit controls and Owner’s BAS. Interface shall provide Owner’s BAS access and ability to manipulate all of manufacturer’s adjustable set points and alarms.

PUMPS
• Water shall be circulated to the heat pump units through a variable flow distribution loop fed by two base mounted centrifugal pumps, each sized for 100% of the block load for full redundancy. Each pump shall have a variable frequency drive for variable flow operation. Variances from this requirement require AE to provide calculations and narrative explaining design rationale. AE must receive Owner approval for any variances from this requirement.

• All hydronic systems shall have main and standby pumps. See direction for sizing and system diversity indicated under Cooling Towers section.

VENTILATION (DOAS)

• Outside air for ventilation and humidity control shall be provided by Dedicated Outdoor Air Systems (DOAS) designed to provide discharge air in a range of temperatures from cold to neutral temperature 52°-75°F and to deliver no lower than 48 Deg F apparatus dew point air to handle the latent load of the outdoor air on a design day and to handle some of the people latent load within the building. Provide bypass dampers as required around heat recovery heat exchangers to provide for economizer operation.

• The unit shall maintain a slight positive pressure throughout the school at all times. Design for positive pressure but no more than 0.05 inches H2O.

• DOAS units shall include energy recovery, CO2 controlled outdoor air volume, variable speed supply and exhaust fans, hot gas reheat and sensible plate heat exchangers and outside air and return air dampers. Wheel designs for heat recovery are not permitted unless for AHUs over 10,000 CFM.

• Air shall be ducted from the DOAS units directly to each space through a ceiling diffuser.

• Humidistats and CO2 sensors shall be provided in all large spaces and in a representative sampling of classrooms (no less than 20% of the total number) and office areas for monitoring space relative humidity and CO2. Space temperature, humidistats, and CO2 sensors may be combined into a single wall device.

• Provide BACnet building automation system interface between manufacturer’s DOAS unit controls and Owner’s BAS. Interface shall provide Owner’s BAS access and ability to manipulate all of manufacturer’s adjustable set points and alarms.

• Owner’s BAS vendor shall provide BAS controllers to the DOAS manufacturer’s factory for mounting and wiring at the factory.

• All floors of DOAS units shall be specified as aluminum or stainless steel plate type for corrosion resistance.

VENTILATION (Fans)

• Specify low speed, high volume, no-cage fans in big box spaces (cafeteria, multi-purpose, gyms, media, and auditoriums.) Basis of Design is Big Ass Fans Essence (E1). The fan shall be furnished with standard mounting hardware and all required accessories as manufactured by Big Ass Fan Company or approved equal. If Big Ass Fans is selected AE shall request equipment with logo only no verbiage (I.e., donkey visual without words Big Ass Fans.)

OCCUPANCY SCHEDULES

• Occupancy Schedules shall be determined on a Project Specific basis and documented in the Project Specific OPR.

EQUIPMENT AND GENERAL REQUIREMENTS BY SPACE

CLASSROOMS
Each classroom shall have a dedicated Water Source Heat Pump unit located in a Mechanical Closet off the corridor for access without entering the classrooms. When multiple are in the room sufficient space for servicing and removing the unit must be included in the design.

Each classroom shall have a separate thermostat/sensor to control temperature that is connected to the BAS.

MECHANICAL CLOSETS

Shall be laid out and designed with the same configuration throughout a project including, but not limited to, location of service clearance, valves, and electrical connections, electrical disconnects, control panels, filter sizes and access. Minimum clearances in the closets shall be 3’ around the services sides (a minimum of two sides of unit, one side may be measured with closet door opened).

LARGER SPACES (MEDIA CENTERS, GYMNASIUMS, CAFETORIUMS, ETC.)

Shall have dedicated loop water cooled HVAC systems.

Units shall be located on the roof of the area being served. If the units cannot be located on the roof, the units may be located at the ground level.

The maximum height to top of the air handler shall not be more than 10’ above finish floor.

Where the dedicated units serving these larger spaces provide outdoor air for ventilation directly through the unit (i.e. do not use the DOAS), the units shall be sized to handle the expected sensible and latent loads of the outside air while still having the capability to maintain indoor comfort temperature and humidity conditions in the spaces served under all load conditions throughout the year (full and part load).

OFFICES/CLINIC

Office areas may have no more than two (2) offices on single heat pump units.

Zoning of spaces to single units shall be done carefully to avoid one unit serving different space use types (example: offices and conference rooms) or serving spaces with different exterior envelope exposures.

Heat pumps shall be ducted to overhead air distribution systems.

Clinics shall have negative pressure to surrounding areas. See note above regarding equipment sizing when not utilizing DOAS units.

CORRIDORS, ENTRY SPACES, AND ATRIUMS

Corridors, Entry ways, Security vestibules, and Atriums shall be tempered as necessary to maintain a maximum of 78 degrees in cooling and a minimum of 65 degrees in heating in occupied mode.

Tempering of corridors shall use air from classroom units or DOAS units. No additional equipment is necessary for corridors.

KITCHEN

There shall be two (2) HVAC zones in the kitchen:

- Cooking / Prep Area
- Managers Office and Dry Storage

AE to coordinate kitchen hood with Food Service designer. Hood to be designed by mechanical engineer and installed by mechanical contractor.
• Rooftop kitchen exhaust fans shall be hinged with sufficient length on the electrical connection so that the fan can be easily moved (tipped) for cleaning and maintenance.

• Consider kitchen hood make up requirements in selection of HVAC units to serve kitchen and cafeteria.

• Provide a doorbell at the receiving door that can be heard by the staff in the kitchen.

GROUP TOILETS

The AE shall establish a negative pressure in these areas and ensure use of direct drive exhaust fans to serve these spaces.

INDIVIDUAL TOILETS

Ceiling mounted exhaust fans shall be acceptable ducted to the outside of the building.

TELECOMMUNICATIONS ROOMS (TR), MAIN TELECOMMUNICATION ROOM (MTR), FACILITY SECURITY ROOMS

• TRs and MTRs shall be designed with a raised threshold, walls from the floor to the bottom of floor or roof deck above, with all penetrations sealed to prevent free air return from adjacent spaces.

• Do not connect condensate drains in these areas to other drain systems; pipe directly to outside.

• No piping to be installed above MTR rooms.

• Specify dedicated air cooled, cooling only HVAC systems to operate 24/7/365 as required to meet set points.

• Provide BACnet building automation system interface between manufacturer’s TR and MTR HVAC unit controls and Owner’s BAS. Interface shall provide Owner’s BAS access and ability to manipulate all of manufacturer’s adjustable set points and alarms.

• The size of the dedicated unit shall be sufficient to accommodate the heat generated by the equipment. Refer to the Technology Design Specifications and Facility Security Access Control, Intrusion Detection, and Surveillance Design Specifications documents for requirements.

INDOOR ENVIRONMENTAL QUALITY

TEMPERATURE

The HVAC systems and BAS shall be capable of maintaining space temperature set points within 2 degrees F (plus or minus) head to foot and from space to space.

SET POINTS - OCCUPIED

• Indoor cooling shall be 74 Degrees F

• Indoor heating shall be 70 Degrees F

SET POINTS UNOCCUPIED

• Indoor Cooling Set shall be 84 Degrees F

• Indoor Heating Set shall be 60 Degrees F

HUMIDITY

Indoor Relative Humidity shall range between 40% and 60% with a design indoor relative humidity of 55%. 
AIRFLOW
Airflow shall be designed in accordance with ASHRAE Handbook, ASHRAE STD 55.1, and
STD 62.1.

ACOUSTICAL REQUIREMENTS
Noise levels in classrooms shall not exceed 25 NC (noise criteria).

VIBRATION REQUIREMENTS
- Rotating or vibrating equipment shall be provided with properly sized vibration isolators either
  as part of the manufactured piece of equipment or as an added component.
- All pumps shall be provided with flexible pipe connections.
- Air handling equipment shall have flexible duct connections (and flexible pipe connections if
  connected to a piping system).

SEISMIC REQUIREMENTS
Seismic restraint and isolation shall be provided in accordance with the currently adopted
code. Seismic, wind restraint, and structural performance criteria shall refer to the structural
engineer's drawings.

EQUIPMENT START UP
- All systems shall have a factory start-up performed by manufacturer trained, certified
  representative in the direct employ of the manufacturer.
- All systems shall be labeled correctly and be in agreement with the BAS system.
- All units shall have a factory start up sheet completed (hard copies and PDF) provided in the
  project close out documents.
- Startup sheets shall include the locations of all supply air, return air, outdoor air and exhaust
  air-balancing devices.
- Contractor shall change filters on all systems once or as required by OPR prior to Owner
  Occupancy.
- Water treatment shall begin as soon as the system is flushed of construction debris to the
  satisfaction of the Commissioning Agent.

SYSTEMS/EQUIPMENT/MATERIALS NOT ALLOWED
- Fibrous duct liner and duct board
- Copper gas lines
- Condensate pumps are not allowed except for ductless mini split style units.
- Step-up or step-down transformers are not allowed on the input or line voltage side of units.
  This does not apply to factory-mounted transformers internal to the units.
- No refrigerant piping shall be run in floors, walls or under slab except for penetrations.
- Do not re-use any existing refrigerant lines.
- Stored units – shall not be left unprotected from the elements.

HVAC PIPING SYSTEMS
- All piping for HVAC systems shall be Schedule 40, ERW black steel with either welded or
  screwed joints. Piping shall be from a domestic manufacturer.
- Condensate lines from AHU’s and fan coil units shall be type “L” copper. PVC piping is not
  allowed for Condensate lines from AHU’s and fan coil units.
• Cold water lines and chilled water / hot water run outs (1 inch and smaller) shall be type “K” copper with soldered joints.
• All exposed piping (insulated and uninsulated) shall be painted and color coded.
• Piping shall be color coded as follows with flow arrows and labels located at 10 foot intervals, at all turns, and at each floor or wall penetration:
  a. Chilled water - Light Blue
  b. Hot water - Light Red
  c. Dual Temperature - Orange
  d. Make up water - Dark Blue
  e. Condenser lines - Green
  f. Gas Lines - Yellow
• Chilled water piping shall be insulated cellular glass and flexible elastomeric above ground with manufacturer's recommended factory applied jacket.
• Chilled water piping shall be insulated cellular glass below ground.
• Contractor shall dimension actual location of all underground piping on as-built drawings. A minimum of two (2) dimensions from building reference points shall be provided and a bury depth indicated.
• All underground lines shall be marked with a bright colored continuous plastic tape on top of the line.
• All underground steel piping shall have cathodic protection.
• All piping systems shall be thoroughly chemically cleaned, flushed out and filled with appropriately treated water/fluid before placing into operation.
• Hydronic systems shall be connected to bypass all HVAC units and equipment before cleaning and flushing begins and then flushed and the filters cleaned out at least three (3) times before the units are connected to the system and placed in operation. Remove startup filters from pump suction strainers once cleaning and flushing operations are complete and before TAB.
• Provide shut-off valves for all hydronic mains at all take-offs to mechanical rooms and pump rooms.
• Automatic flow control devices shall be used on all hydronic systems.
• All Cooling Towers shall be completely cleaned and flushed after all systems are in operation and the site work has been completed prior to turning over to Owner. (AE shall approve flushing procedures and the Engineer shall be present at flushing).
• Sectional shut off valves shall be provided at the supply and return side of all equipment to allow for shut off of a section of piping for repair.
• All damper operators, control and service valves shall be installed such that they can be serviced by personnel standing on the floor of the mechanical room.
• The water source heat pump condenser water loop shall not be insulated.

**DUCTWORK**

• All duct shall be galvanized metal except:
  o Run-outs to VAV boxes and air distribution devices, flexible duct is allowed – maximum 6 foot length.
  o Kitchen – use stainless steel with welded joints for kitchen hood and dishwasher exhaust.
• During construction, ducts shall be sealed at all openings to protect the duct from construction dust/debris.
• All mechanical systems and equipment shall be inspected at final inspection as to the cleanliness; units shall be in “like new” condition and any coils, covers, grills, etc. shall be free from damage.
• Minimize use of exposed ductwork.
• Duct insulation that gets wet shall be removed and replaced.
• Duct insulation thickness shall be 2” minimum or as required by adopted energy code whichever is thicker.
• All duct shall be constructed to SMACNA seal to Class “A”. All duct shall meet SMACNA Duct Construction Standards for Metal and Flexible Ducts.

**REGISTERS AND DIFFUSERS**

• Shall use 4-way adjustable volume diffusers
• Shall use aluminum grilles, registers and diffusers in all locations unless steel is required by fire codes.
• Return Air filter grills shall be used where practical. Areas with high ceilings i.e. café, multipurpose rooms, gymnasiums, etc. shall be filtered at the unit.
• Slot diffusers and perforated diffusers shall not be permitted.
• Provide manual balancing dampers in all run outs to air distribution devices. Do not allow use of dampers in the device for testing and balancing.
DIVISION 25 - BUILDING AUTOMATION SYSTEMS (BAS)

SPECIFY the following for the BAS

GENERAL SYSTEMS CONTROL

- At a minimum the following systems shall be integrated, controlled, managed and monitored through the BAS and Owner Energy Management System:
  - All HVAC systems
  - Lighting (integrated with lighting controls specified in Division 26). Include both interior and exterior lighting
  - Generator(s)
  - Water Heaters
  - Kitchen Hoods (alarm contacts only)
  - Kitchen coolers and freezers (alarm contacts only)
  - Building power demand
  - Building energy consumption
  - Building Natural Gas flow and consumption (Therms)
  - Domestic water flow and consumption (GPM and gallons)
  - Domestic make-up water flow and consumption (GPM and gallons) for all mechanical systems
  - Irrigation system water flow and consumption (Only if connected to a municipal water supply)

- A detailed Sequence of Operations shall be written by AE and programmed into the BAS using the required set points, schedules, etc., defined herein.

- Zoning of lighting controls shall be clearly labeled using wing and/or area names from construction prints in the actual controller itself and in a manual to be delivered with close out documents.

- Specify BACnet building automation system interface between manufacturer’s provided controls (all systems listed in this section) and Owner’s BAS. Interface shall provide Owner’s BAS access and ability to manipulate all of manufacturer’s adjustable set points, functions, and alarms.

BAS INTERFACE DISPLAYS

The BAS interface and graphics shall be standard and consistent for all similar systems (system to system) and for all buildings (building to building). Mock ups of the following screens to be included as reference: Cooling tower and loop, Chiller and loop (if applicable), WSHP, Floor Plan, Landing Page, and DOAS. The system shall provide the following minimum information by screen:

Floor Plans shall include:
- Accurate layout of all rooms and floors
- Room names and numbers (Room names only need to be included for non-classroom
spaces such as media, cafeteria, gymnasium, culinary arts, multipurpose, admin, theater, etc.

- Equipment location and callout or number
- Space temperature/humidity/CO2 as appropriate based on space type. (Space temperature/humidity/CO2) radio button/graphic box shall be green background with white text if all actual readings are within tolerance for setpoint. Box shall turn red or yellow with black text if measured/sensed point is in alarm
- Current outdoor air temperature/humidity/CO2
- Power demand in kW (current, max today, peak this week, peak this month, peak this year)
- Power consumption in kWh (total today, total week to date, total month to date, total year to date)
- Water consumption in gallons (total today, total week to date, total month to date, total year to date)
- Natural Gas in therms (total today, total week to date, total month to date, total year to date)

**Water source heat pumps shall include**

- Commanded status and actual status of unit (occupied, unoccupied)
- Room temperature set point (heating and cooling)
- Room temperature (and CO2 and humidity as defined in Division 23)
- Unit discharge air temperature
- Fan status
- Commanded position and actual position of loop water control valve (open or closed)
- Current outdoor air temperature and humidity
- Include manufacturer’s model and serial numbers, location on the graphic for each unit, and with Filter sizes and quantities.

**DOAS shall include**

- Current outdoor air temperature, humidity and dew point and CO2 levels
- Temperature and humidity/dew point of outside supply air entering and leaving energy recovery devices
- Temperature and humidity/dew point of building exhaust air entering and leaving energy recovery devices
- Temperature of cooling coil discharge air
- Commanded and actual supply fan status
- Supply fan VSD commanded and actual speed
- Exhaust fan VSD commanded and actual speed
- Include manufacturer’s model and serial numbers, location on the graphic for each unit, and with Filter sizes and quantities.

**Loop Water System shall include**

- Water flow (GPM) to building
• Water supply temperature to building
• Water return temperature from building

**Loop Water Pumps shall include (INCLUDED ON COOLING TOWER INTERFACE)**
- Status (lead/lag/on/off/speed)
- Include manufacturer’s model and serial numbers, location on the graphic for each unit.

**Boilers/Loop Water Heaters shall include**
- Status (on/off)
- Leaving water temperature (setpoint and actual)
- Include manufacturer’s model and serial numbers, location on the graphic for each unit.

**Evaporative Cooling Towers shall include**
- Spray pump status (on/off)
- Fan status (on/off/speed)
- Entering water temperature
- Leaving water temperature (setpoint and actual)
- Make-up water flow (GPM) and total gallons (today, week to date, month to date, year to date)
- Include manufacturer’s model and serial numbers, location on the graphic for each unit.

**General Exhaust Fans (larger fans not controlled by light switch in space) shall include**
- Status (on/off/occupied/unoccupied)
- Include manufacturer’s model and serial numbers, location on the graphic for each unit.

**Laboratory Fume Hood Exhaust Fans shall include**
- Status (on/off)
- Include manufacturer’s model and serial numbers, location on the graphic for each unit, and with Filter sizes and quantities if applicable.

**Kitchen Hood Exhaust and Make-up Air fans shall include**
- Status (on/off/speed (if applicable)
- Include manufacturer’s model and serial numbers, location on the graphic for each unit, and with Filter sizes and quantities if applicable.

**Kitchen Hood Make-up Air Heaters shall include**
- Status (on/off/percent kW or firing rate)
- Discharge air temperature (setpoint and actual)
- Include manufacturer model and serial numbers, location on the graphic for each unit.

**TR and MTR Room shall include**
- Room Temperature level

**BAS Alarms and Notifications**
- Owner’s BAS vendor shall display within BAS and send Alarms and Notifications to
designated District personnel via email and text message for the categories listed below.

Messages shall repeat transmission of the alarm or notification once per hour until someone logs into the facility management system in response.

**ALARMS AND NOTIFICATIONS**

**General Alarm Requirements:**

- Space temperature/humidity/CO2 as appropriate based on space type. (Space temperature/humidity/CO2) radio button/graphic box shall be green background with white text if all actual readings are within tolerance for setpoint. Box shall turn red or yellow if measured/sensed point is in alarm.

- All other alarms shall be shown in one of the margins of the floor plan and have a noticeable designation if the point or system is in alarm. Water source heat pumps shall include:

  - Alarms for:
    - Room temperature variation ± 4 degrees from set point
    - Room humidity > 70%
    - CO2 Levels > 1600

**DOAS shall include**

- Alarms for coil discharge temperature variation ± 4 degrees from coil set point
- When commanded and actual supply fan status does not agree with commanded condition within 15 minutes of command.
- When supply fan VSD commanded and actual speed does not agree with commanded condition within 15 minutes of command.
- When exhaust fan VSD commanded and actual speed does not agree with commanded condition within 15 minutes of command.

**Loop Water System shall include**

- Alarms for:
  - Loop supply temperature variation ± 5 degrees from set point in heating or cooling modes.
  - High temperature alarm at 115 degrees F
  - Low temperature alarm at 40 degrees F

**Loop Water Pumps shall include**

- When pump status commanded and actual speed does not agree with commanded condition within 10 minutes of command. (lead/lag/on/off/speed)

**Boilers/Loop Water Heaters shall include:**

- Boiler failure from Boiler Manufacturer’s boiler control panel (BCP)

**Evaporative Cooling Towers shall include**

- Variable speed drive failure on CT fan.
- When make-up water flow (GPM) exceeds peak recorded flow rate for more than 5 minutes or it exceeds average flow rate for more than 30 minutes.

**General Exhaust Fans (larger fans not controlled by light switch in space) shall include:**
Laboratory Fume Hood Exhaust Fans shall include:
- When fume hood exhaust fan status is on when zone is unoccupied.

Kitchen Hood Exhaust and Make-up Air fans shall include:
- When hood exhaust and make-up air fan status is on when zone is unoccupied.

Kitchen Hood Make-up Air Heaters shall include:
- When kitchen hood make-up air heater status is on when zone is unoccupied.

TR Rooms and Other Stand Alone HVAC systems shall include:
- Alarm temperature variation >5 degrees from set point

**BAS Trend Reports**

All trends shall be for 15 minute intervals unless noted otherwise. The BAS compile trending data shall be as follows:

- **Global system trends shall include for each site and a cumulative total**
  - Outdoor air temperature, humidity/dew point and CO2 levels
  - Power Demand (kW), building main and all submeters (current, max today, peak this week, peak this month, peak this year)
  - Energy Consumption (kWh), building main and all submeters (total today, total week to date, total month to date, total year to date)
  - Water Consumption (gallons), building main and all submeters (total today, total week to date, total month to date, total year to date)
  - Natural Gas Consumption (therms), building main and all submeters (total today, total week to date, total month to date, total year to date)

- **WSHP shall be capable of trending**
  - Discharge air temperature
  - Unit status (on/off/heat/cool)
  - Fan status
  - Space temperature/humidity/CO2 (set point and actual)

- **DOAS shall be capable of trending**
  - Current outdoor air temperature, humidity and dew point and CO2 levels
  - Temperature and humidity/dew point of outside supply air entering and leaving energy recovery devices
  - Temperature and humidity/dew point of building exhaust air entering and leaving energy recovery devices
  - Temperature of cooling coil discharge air Commanded and actual supply fan status
  - Supply fan VSD commanded and actual speed
  - Exhaust fan VSD commanded and actual speed
  - Supply air flow (CFM)
  - Exhaust air flow (CFM)
Loop water control valve position (commanded and actual)
Outdoor air damper position (commanded and actual)
Building exhaust air damper position (commanded and actual)

WIRING

- All control wiring shall be routed in conduit and shall be color-coded.
- Conduit, wiring sizes, and type of insulation shall be in accordance with Division 26 – Electrical, and shall conform to the currently adopted edition of National Electrical Code.
- All electrical equipment shall bear UL labels.
- Each control circuit shall be protected by a circuit breaker of the proper size.
DIVISION 26 – ELECTRICAL

SPECIFY THE FOLLOWING FOR ELECTRICAL

GENERAL REQUIREMENTS

- Contractor shall provide for TEGG testing of the electrical power distribution system and provide documentation to the owner of the following tests: NFPA 70 compliance, Infrared Thermography, Ultrasonic Testing, De-Energized Testing, Energized Testing, Voltage and Ampere Diagnostics, Proper Torqueing. The TEGG inspection shall be performed by an independent 3rd party electrical contractor certified by the TEGG Service Corporation.


- All electrical service inside the building shall be above grade in EMT.

- All electrical service outside the building shall be contained in stainless steel, NEC approved PVC or NEC approved flexible PVC.

- Main building feed shall be NEC approved PVC

- Remote Electrical Power Shut down station located in front entrance shall be Knox-Vault #4544 and color shall be aluminum.

- Lighting and convenience outlets shall not be on the same circuit. Wiring for lighting and convenience outlets shall be run in separate raceways.

- Avoid outlets closer than six feet to sinks and/or bubblers (omit unnecessary GFI applications).

- Device plates and cover plates shall be oversized Stainless Steel

- In all classrooms, general use wall receptacles shall be approximately 12 feet on center, with a minimum of two on each wall. Receptacles shall be of the Hard Use Specification Grade 20 amp minimum. Toggle switches shall be Specification grade 20-amp minimum. Backstabbed (quick wired) or decorative outlets and switches shall not be used.

- Construction phasing and outage plans shall be included in the contract documents.

- 15% spare circuit capacity shall be provided for future use in all electric panels. Feeder size shall match panel board rating.

- Nameplates shall be engraved three-layer laminated plastic, black letters on white background. Nameplates shall be installed on all equipment, panels, transformers, safety switches, etc., denoting equipment name and/or number and “Fed From”. Embossed adhesive tape with 3/16 inch, black letters on clear background shall be adhered to all wall switches and receptacles to denote Panel and Circuit they are fed from. Nameplates shall not be screwed or riveted.

- A typed directory shall be provided for all electrical panel boards, with all circuits labeled. Labels shall show District approved room names and numbers. Handwritten directories are not permitted.

- Require signage reading “Electrical panels inside” if any space contains an electrical panel.

- Outlets in corridors for floor maintenance shall be at least every 50 ft. of corridor with a minimum of one per corridor.
A duplex receptacle shall be within 25 ft. of both interior and exterior mechanical equipment. Also at least one receptacle at every stairwell landing.

No stand alone floor receptacles are permitted in any space. Floor fed circuits that terminate in lab tables or other affixed furniture are acceptable. Where power is fed from a floor penetration, provide floor sleeve extending one inch above floor slab.

Dedicated outlet and ventilation shall be provided for the kiln in the art area. Owner shall provide AE with cut sheet on proposed kiln for each project. Coordinate ventilation requirement with Program Management.

Coordinate electric booster heater power requirements with kitchen consultant.

Emergency shut off for receptacles, gas, and water shall be provided on wall adjacent to teacher’s workstation. Empty conduits for future branch circuits shall be stubbed out to a secure location normally above ceiling heights.

Plenum rated equipment shall be required in designated ceiling plenum areas and these areas shall be clearly indicated on drawings.

Service clearance for electrical equipment shall be shown on plan views drawn to scale.

Load tabulation shall be shown on the drawing for each service and each feeder.

Indicate SCR and A/C rating for all equipment.

Where load tabulation includes an allowance for existing facilities drawing shall show how the allowance was determined.

Where a new switch or circuit breaker is added to existing service equipment, drawings shall show its relationship to existing main devices.

Where an existing service is being utilized or modified drawing show the existing arrangement.

GROUNDING

Detailed grounding requirements shall be shown on project drawings.

Ground main service by exothermic welding the grounding conductor to main cold water pipe, building steel, footing rebar, and at least three 3/4” diameter x 10’ long ground rods driven 10’ apart outside building in unpaved earth. The rods shall be loop interconnected with each other by a minimum No. 500 MCM AWG bare copper conductor thermal welded, using the proper style mold, to each rod below grade.

Electrical Contractor shall provide designer of record with written documentation that service grounding system resistance measures no more than 5 ohms. Measurements shall be made using The Fall of Potential Method. Supplemental grounding electrodes and / or soil supplements shall be installed as necessary to achieve the specified resistance.

Service entrances shall be protected by ground rod.

Metal water pipe shall be grounded to electrical service entrance.

GROUNDING shall be permanent and electrically continuous, low impedance exothermic weld (cad-weld).

ELECTRICAL SERVICE AND DISTRIBUTION

The design shall be to establish one electrical delivery point (metering point) for all facilities if possible. This excludes seasonal outdoor sport facilities.
• Service conductors from distribution transformers to service entrance or meter base shall be sized for a maximum of 3% voltage drop. Use the ampacity of the overcurrent protection device on the service disconnect equipment for calculations.

• A short circuit study shall be provided, including all interior and exterior lighting, service and feeder sizes and all circuits over 20 Amps. Voltage flicker analysis shall be performed on systems with motors greater than 40 hp to show that the voltage drop does not exceed 5%. Results/report shall be included in project closeout documents.

• Electrical design shall consider and provide adequate (standard of care) protection from the effects of harmonics and non-linear loads

• Provide dedicated neutrals for computer circuits and fluorescent lighting.

• AE shall conduct a Breaker and fuse coordination study. Report shall be included in project closeout documents.

• Panels fed from a utility transformer shall be service rated. Panels fed from existing panel in a different building shall be service rated.

**TVSS AND SURGE PROTECTION DEVICES (SPD)**

• Transient voltage surge suppressors shall be provided at main switchboards, distribution panels and on major feeders and branch circuits serving personal computers and other electronics.

• TVSS and SPDs shall be mounted external to the Panel they serve in a separate enclosure and shall not be integrated into or manufactured by the Panel manufacturer.

• The specified equipment shall be designed, manufactured, tested, and installed in compliance with the following standards: U.L. 1449 current edition and IEC61643. It shall be labeled as an Electromagnetic Interference Filter.

• The qualified manufacturer shall have been engaged in the commercial design and manufacture of such products for a minimum of five years.

• Provide five years Limited Warranty from date of substantial completion for all TVSS.

**SWITCHBOARDS**

• The switchboard shall be designed, manufactured, tested, and installed in compliance with NEMA PB 2. Main section devices shall be individually mounted. Distribution section devices shall be group mounted. Auxiliary section devices shall be group mounted.

• Bus material shall be copper, standard size, fully rated and arranged for future extension. Bus shall be bolted or welded, accessible from front only for maintenance. Grounded and grounding bus shall extend the length of the switchboard.

• Fusible Switch Assemblies NEMA KS 1, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: Designed to accommodate Class J fuses.

• Fusible Switch Assemblies, 800 Amperes and Larger: Bolted pressure or high-pressure contact switches. Fuse Clips: Designed to accommodate Class L fuses.

• Molded Case Circuit Breakers shall be NEMA AB 1 with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits, where applicable. Include shunt trip, undervoltage release and phase loss where indicated.

• Current Limiting Molded Case Circuit Breakers: NEMA AB 1 molded case circuit breakers. Integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically
resetting current limiting elements in each pole. Interrupting rating in rms amperes
symmetrical let-through current, equal to or greater than the switchboard rating. Include
shunt trip, and under voltage release and phase loss where indicated.

- Solid-State Molded Case Circuit Breakers: NEMA AB 1, with sensing, timing and tripping
circuits for adjustable current settings. Ground fault trip, ground fault-sensing integral with
circuit breaker. Adjustable short time trip. Stationary mounting. Include shunt trip,
undervoltage release, and phase loss where indicated.

- Mechanical type terminals shall be provided for all line and load terminators suitable for
copper cable rated for 75 degrees C of the size indicated on drawings.

- Line and Load Terminations shall be accessible from the front of the switchboard.

- Ground Fault Sensor: Ground return type.

- Ground Fault Relay: Adjustable ground fault sensitivity from 200 to 1200 amperes, time delay
adjustable from 0 to 1 second. Provide monitor panel with lamp to indicate relay operation,
TEST and RESET control switches.

- All indicator lights shall be transformer – LED type.

- Ammeters and Voltmeters ANSI C39.1 direct reading, full range, with 4.5-inch square
recessed case and 250-degree scale, white dial with black figures and pointer. Indicating
ammeter, 5 amperes, 60-Hertz movement, and 1 percent accuracy. Indicating voltmeter,
120volt, 60-Hertz movement, and 1 percent accuracy. Coordinate with BAS provider and
specify power metering and monitoring devices with digital output capability to transfer all
data to BAS without special interface devices or translators. Provide digital meters for main
service entrance and subpanels to allow sub metering of HVAC systems and lighting systems
as a minimum.

- Meter transfer switches rotary multistage snap-action type with 600-volt AC-DC silver plated
contacts, engraved escutcheon plate, pistol-grip handle. Ammeter four position including
OFF. Voltage seven position including OFF.

- Microprocessor-based metering equipment shall be by switchboard manufacturers and have
the functions of a Cutler-Hammer type Westinghouse IQ Data Plus II. The MM&P shall be
UL recognized, CSA certified and meet ANSI standard C37.90. Make provisions for an
addressable communication card capable of transmitting all data, including trip data over a
compatible two-wire local area network to a central personal computer for storage and/or
printout. The network shall also be capable of transmitting data in RS 232c format via a
translator module.

- Metering transformers: Current transformers IEEE C57.13, 5 ampere secondary, bar or
window type, with single secondary winding and secondary shorting device,
primary/secondary ratio as required, burden and accuracy consistent with connected
metering and relay devices, 60 Hertz. Potential Transformers IEEE C57.13, 120volt double
secondary, disconnecting type with integral fuse mountings, primary/secondary ratio as
required, burden and accuracy consistent with connected metering and relay devices, 60
Hertz. See control specification for current transformer assembly.

- A 4” high concrete housekeeping pad shall be installed for the main switchboard.

DISTRIBUTION AND BRANCH CIRCUIT PANELBOARDS

- Sizes of distribution panels and branch circuit panels shall be shown on drawings.

- Minimum integrated short circuit rating as calculated.

- NEMA PB1 panel board with NEMA AB1 circuit breaker type.
• Buses and ground shall be copper.

• Neutral bus for panel boards being served by nonlinear load (k-factor) transformer shall be rated at 200 percent of the phase bus current.

• Cabinet shall be surface mount type only in electrical/mechanical/storage rooms, fastened with hinged door with flush lock, finished in standard gray enamel.

FUSES

Spare fuse cabinet shall be wall-mounted sheet metal with shelves, suitable sized to store spare fuses and fuse pullers specified. Finish ANSI gray. One additional set of fuses shall be included as spare at the acceptance, by Owner, of the electrical system.

TRANSFORMERS

• Winding taps for transformers less than 15 KVA shall have six (6) 5 percent taps; two (2) above and four (4) below rated voltage, full capacity taps on primary winding. Transformers 15 KVA and larger shall also meet NEMA ST 20.

• Transformer shall be suitable for floor mounting if larger than 15 KVA and floor and/or wall for 15 KVA and below. Transformer shall be rated for 80 degree C rise above 40 degree C. Efficiencies shall meet or exceed NEMA TP-1 Class 1 efficiency.

• Provide K rated transformers for computer and electronic equipment circuits. Non-Linear Load Isolation transformers shall be used only for dedicated computer loads. Minimum of K-4.

• Housekeeping pads shall be a minimum of 6" high.

• Interior transformers shall be mounted a minimum of 6 inches from wall and secured to housekeeping pad. Provide manufacturer’s recommended service clearance on accessible side of transformer.

PACKAGE ENGINE GENERATORS

Generators shall not be provided unless required by the Project Specific OPR.

ENCLOSED TRANSFER SWITCHES

• Switches shall be provided with the generator package. Substitutions are not permitted.

• If unit is a floor mounted install a 4" high concrete housekeeping pad.

• Components:

• Mount indicating lights in cover of enclosure to indicate NORMAL SOURCE AVAILABLE, ALTERNATE SOURCE AVAILABLE, and SWITCH POSITION.

• Mount test switch in cover of enclosure to simulate failure of normal source.

• Mount return to normal switch in cover of enclosure to initiate manual transfer from alternate source to normal source.

• Transfer switch shall contain 2 each normally open and normally closed auxiliary contacts.

• Monitor each line of both Normal and Alternate source voltage and frequency. Initiate transfer (alternate inhibit transfer) when normal voltage (alternate voltage) drops below 85 percent or frequency varies more than 3 percent from rated nominal value.

• Neutral switching shall be simultaneous.

• Automatic Sequence of Operation:
Upon initiation by normal source monitor initiate time delay (0 to 60 seconds adjustable) to start alternate source engine generator.

- Initiate transfer load to alternate source (0 to 10 seconds, adjustable) with permission of alternate source monitor.
- Transfer back to normal source with permission by normal source monitor (0 to 30 seconds, adjustable). Bypass if alternate source failure.
- D. Time delay before engine shuts down (0 to 60 minutes, adjustable) of unloaded operation.
- E. Engine Exerciser shall start engine every 7 days. The engine shall run for 30 minutes before shutting down. Bypass exerciser control if normal source fails during exercising period. Transfer load to alternate source during engine exercising period.

LIGHTING

- Lighting systems shall be specified with a BACnet interface with Energy Management System specified in Division 25 (BAS).
- Lenses shall be .125” or 1/8” in thickness.
- Wall switch products shall be capable of withstanding current surge.
- Generally, spaces shall be lighted with 2 x 4 lay-in LED fixtures. See Appendix A for approved LED manufacturers.
- Where rebates are provided by SCE&G, such as their Energy Wise Program, light fixtures, ballasts, lamps and controls shall be specified to maximize the amount of rebates available.
- Lighting design shall minimize the number of fixture types.
- Custom built light fixtures or one of kind shall not be allowed.
- Areas such as atriums, coves and other difficult to access areas shall use LED lights. Light locations shall not require the use of scaffold or a lift to replace bulbs.
- All lighting systems shall be easily assessable for maintenance and service.
- All classroom lighting shall have dimmable fixtures and dimmers. Row of lights above/adjacent to SMARTboards shall be on separate dimmer from other classroom lighting.
- Gymnasiums and other multi-purpose rooms shall be lighted with LED fixtures and shall have safety chain to actual fixture and be controlled by remote dimmers lockable control panel. Gym lighting shall have two zones. One zone shall control fixtures over the playing area and one zone shall control fixtures around the perimeter.
- Elementary and Middle School Cafetorium stage lighting shall be simple LED track type systems. Theatrical lighting shall LED type and be designed on a per school basis.
- Security and site lighting shall be controlled by and integrated into BAS via BACnet. Security lighting shall be defined as the wall packs on the perimeter of the school and selected parking lot and roadway lights to illuminate access points at the schools.
- All other site lighting including walkway, sign and non-security parking lot lighting shall be LED type and controlled by BAS via BACnet.
- Exterior lighting in stairways and sidewalks shall be flush mounted and easy to access for maintenance. Recessed lighting in concrete is not permitted.
• Exterior lighting for walkway and parking areas shall be LED type using cutoff reflectors and lens to reduce light pollution. Exterior lighting shall be controlled by BAS via BACnet.

• Emergency lighting shall be provided by dedicated low wattage LED fixtures. They shall be powered from small wall mounted battery operated inverters located in the electrical rooms. Inverters shall be designed with 20% spare capacity and shall be arranged to minimize the number of batteries. 2X4 Fluorescent light fixtures with battery packs are not acceptable.

• Lighting for corridors and common areas shall be controlled by multiple switch legs and to allow after hours and weekend movement when automatic lighting controls are in override mode.

• Football, soccer, softball and baseball fields lighting shall be provided by MUSCO and stadium lighting shall be positioned so that it is accessible for maintenance.

• Modular wiring is not permitted.

• The light fixtures in the individual spaces shall not be used as a junction box;

VACANCY SENSORS

• Vacancy sensors shall be specified for space lighting control. Occupancy sensors are not permitted.

• Wall sensor/switches shall be ceiling mounted using both infrared and ultrasonic (dual technology) sensors.

• Restrooms shall not use ultrasonic vacancy sensors.

• The Media Center reading room shall use ceiling mounted ultrasonic vacancy sensors – each sensor shall cover no more than a 30 ft. x 30 ft. area with a 20% overlap of sensor coverage.
DIVISION 27 – COMMUNICATIONS

GENERAL REQUIREMENTS:


- CCSD Information Technology and Security leaders have agreed in principal to combine the specified Facility Security Room (FSR) and Main Telecommunications Room (MTR) into a single space to reduce the technology “footprint”. Until details are finalized, the MTR size requirement is hereby increased to 12’ X 16’ and the FSR is eliminated. All other requirements remain unchanged.

TELECOMMUNICATION ROOM REQUIREMENTS:

- Telecommunication rooms will be designed for placement in collaboration with CCSD-IT or minimally one TR per 10,000 square feet on each floor centrally-located in the zone.

- Temporary site power must remain outside TRs.

- No water-carrying piping routed through rooms or in adjacent walls.

- If code requires sprinklers; heads shall be caged and drip trays are required to protect equipment racks within room.

- Room shall be cleaned every 30 days during construction to prevent build-up of dirt and debris in the room.

- Ground bars shall be installed.

- Lighting shall be sufficient for technician to work on equipment without supplemental light. Lights shall be LED.

- Each room shall be conditioned by its own independent HVAC unit.

- Immediately prior to cabling start:
  a. Floor shall be sealed
  b. Plywood backboards shall be installed and painted
  c. Core holes in ceiling or floor (if needed) shall be in place and complete with sleeves and bushings
  d. Penetrations from equipment room to hallway shall be complete
  e. Room shall be clean and free of debris
  f. A lockable door shall be in place

Project Status Before Hand-off to CCSD-IT For Cabling:

- IT overhead rough-in shall be scheduled to precede placing ceiling grid & tiles in hallways
- Cable tray shall be installed & properly supported- weight demands approved supports no more than 5’ apart
- Conduits with pull strings & bushings shall be properly grounded from cable tray to each work area location
- Flex & speaker back boxes (with pull strings & bushings) from 4x4 boxes shall be installed
- Flex, tile-bridge and boxes shall be installed for all wireless outlets

Charleston County School District
Design Requirements for New Construction and Major Renovation
Release #03 - June 2016. Revisions to the text from the previous version are underlined and logged in Appendix B.
• Flex and boxes shall be installed for all ceiling mounted connections
• If classrooms have high ceilings and boxes have been installed that IT will pull through, grid/tiles shall not be installed prior to coordinating overhead rough-in with CCSD-IT
• Roof masts and conduit to reception desk for radio communications shall be installed
Division 31 Sections will vary with each project. Renovation projects may have little site work, whereas a new facility or addition may have significant or extensive site work.

Bind the subsurface reports in the Project Manual.

**SPECIFY THE FOLLOWING FOR EARTHWORK**

**SITE DEVELOPMENT DESIGN CONSIDERATION**

There are many issues to be addressed in the site design of a school. These considerations include:

- Allowance for future building expansion and accommodation of future mobile classrooms.
- Development of circulation patterns that separate pedestrian and bike traffic from vehicular traffic, the bus drop/parking from the parent drop off and staff parking from student parking.
- Main building entrances are readily identifiable.
- Utilization of exterior terraces/patios for outdoor learning areas.
- Providing disability access to all buildings and play areas in accordance with State and Local Codes and ADA requirements, including auditorium and cafeteria stages.
- Minimize the building’s environmental impact on the site per the SCDHEC-OCRM Storm Water Management Program:
  - run-off control (watershed issue)
  - minimize excavation
  - protect trees at drip lines from construction activities and grade changes
  - minimize grounds maintenance
  - protect wetlands; follow setback requirements set by SCDEHC-OCRM or local jurisdiction, whichever is more restrictive.
  - promote onsite infiltration through the use of pervious concrete, pervious asphalt and/or subsurface retention devices

**DEWATERING**

Specifies permanent-dewatering requirements not covered in other Division 1 sections. Require Contractor to prepare and submit a Dewatering Plan for approval by the AE and Program Management.

**EARTHWORK**

- Coordinate this Section with Division 1 Sections, including Allowances, Unit Prices, and Temporary Facilities.
- In general, the site shall be graded to balance cut and fill.
- Specify and adequately define all materials to be encountered or brought to the job site in the course of the earthwork operations. This shall include but not limited to the various soil classifications, sub-base materials, drainage fill, and backfill materials. Clearly define rock materials in both open excavation and trenches. Explosives shall not be used without written approval from Program Management.
- Contractor and Program Management shall obtain written acceptance of final grading from Owner prior to seeding/sodding grounds.
- Rock Definition: Rock material in beds, ledges, non-stratified masses, and conglomerate deposits and boulders or rock material and pit excavation that cannot be removed by rock excavating equipment equivalent to the following performance ratings, without systematic drilling, ram hammering, and ripping:

- Rock shall not be removed until it has been cross-sectioned by a South Carolina Registered Land Surveyor. The AE shall classify and verify quantities prior to removal.

- Include by reference, the geotechnical report for the site in the contract documents.

- Undercutting and removing unsatisfactory soils from excavations and recommendations for replacement soils shall be described in the Construction Documents if the amounts can be clearly defined in the documents.

- Specify compaction procedures and requirements to suit the Project.

- Program Management shall coordinate cut and fill needs/supply between current and nearby Owner projects.

TERMITE CONTROL

- All new construction requires termite treatment of all buildings on the site.

- Initial soil treatment shall be by applying chemical termiticides to the soil (not bait systems). Termiticides shall be registered with and applied in accordance with the Environmental Protect Agency and the South Carolina Department of Fertilizer and Pesticide Control.

- Post warning signs in treated areas.

- Termiticides shall not be applied when soil is excessively wet or frozen, or when rainfall is predicted as imminent.

- Pest Control Operator (PCO) shall be licensed with the South Carolina Department of Fertilizer and Pesticide Control.

- Final surface preparation shall be provided by the PCO prior to treatment to include the removal of foreign matter and debris; and loosen, rake, and level soil if it is highly compacted or uneven.

- Treatment of soil adjacent to exterior foundation walls shall be done after all required grading, excavating, and final landscaping and filling operations are completed.

- Voids in block wall construction shall be treated as close as possible to the footing and foundation.

- Trenching or trenching combined with rodding shall be used to treat soil adjacent to the foundation walls.

- A compatible dye shall be used in the termiticide to provide visible evidence or treatment.

- A quality control inspection shall be conducted after treatment and a report submitted to AE

SITE CLEARING

- Site must be fully cleared of all debris in any finished landscaped, hardscaped, or built area.

- Contractor and Program Management shall obtain written acceptance of final grading from Owner prior to seeding/sodding grounds.

- Burning trash or construction debris on site is not permitted.

- Burying of construction debris on site is not permitted.
• Photograph the site conditions prior to site clearing. Photographs shall be included in project closeout documents.

DIVISION 32 – EXTERIOR IMPROVEMENTS

SPECIFY THE FOLLOWING FOR EXTERIOR IMPROVEMENTS

GENERAL

• Provide designated vehicular access to all outdoor athletic facilities, landscaped areas, and interior of tracks. Hardscape, paving materials should be able to withstand vehicular traffic in these areas.

• Require the contractor to maintain all landscaping until written notice of acceptance is received from Owner.

BUS DROP-OFF, PARENT DROP-OFF and PARKING TRAFFIC

• These three functions shall be separated as much as possible.

• At all drop off areas that discharge or pick-up of students at the loading-unloading zones shall be from the side of the vehicle opposite the driver and toward the buildings. Vehicle stacking shall be accounted for in the design so as not to impede the flow of traffic off campus.

• Parking bays for full-service buses shall be a minimum of 15ft. wide

• Backing up of buses shall not be required or permitted.

• A minimum outside turning radius of 50 feet shall be provided at bus driveways and parking areas. The minimum inside radius shall be 32 feet.

• Sidewalks shall be provided at each loading/unloading area.

BUILDING ENTRANCES

• All primary building entrances used for students shall be protected from weather by overhead cover or soffit and shall be readily identifiable from vehicle approaches and parking lots.

• Each loading/unloading area shall have a covered canopy and covered walkway leading into the building.

• For larger schools the bus drop canopy shall be a minimum of 12 ft. wide and 100 ft. long and walkway canopy to the building be a minimum of 8 ft. wide.

• Bottom of canopy soffits shall be a minimum of 10 ft. above finish grade at bus drops.

• Columns supporting canopies shall be set back from the curbs a minimum of 4 ft. to allow car or bus doors to open.

• Canopies shall be designed to avoid roosting of birds.

• Where canopies and covered walkways block access to courtyards and other areas, coordinate with Fire Department, Emergency Services and utility companies and provide for access to that area.

SERVICE DOCKS

• Service docks shall be covered or partially covered.

• Dock height shall be at 48 in. Use concrete, not asphalt, for dock surface.
• Specify installation of dock pads and dock leveler.

RETAINING WALLS
Retaining walls with a height of 5 ft. or greater or walls subjected to surcharge loading (i.e. vehicle traffic, sloping backfill, or point loads) shall be designed and stamped by a professional engineer.

STORAGE BUILDINGS
Shall be provided if required by Educational Specifications and/or OPR. AEs are required to use finish materials and colors to match adjacent buildings.

EXTERIOR MECHANICAL AREAS
• Shall be enclosed with security fencing and vehicle stops.
• Provide reinforced concrete slab with fenced area with proper sized pads/curbs for equipment mounting.
• Slope slab away from building.

HOT – MIX ASPHALT PAVING
• Heavy-duty pavement as specified by SCDOT shall be used for car loading, bus loading, truck access, and delivery drives.
• Pavement marking paint complying with FS TT-P-1952, applied to a minimum wet film thickness of 15 mils.
• Specify field quality control tests to be coordinated by contractor and provided by Owner’s testing agency.

CEMENT CONCRETE PAVEMENT
• Concrete shall be specified for service pads and walkways. Stamped, patterned, and colored concrete are not permitted in these areas.
• Control joints, isolation joints, and expansion joints shall be shown on the drawings.
• Expansion joints shall conform to ASTM D 1751, ASTM D 1752, or current SCDOT standards. All roadways, parking lot islands, and dumpster pads/enclosures shall have curb and gutters.
• Curbs shall be tapered (sloped). Blocked curbs are not permitted.

PAVEMENT JOINT SEALANTS
• Joint sealants shall be used for concrete-to-concrete and concrete-to-asphalt pavement joints outside the building. The type of sealant shall be appropriate for its intended use.
• Expansion and control joints in walkways and joints abutting the building at doorways and masonry walls shall be sealed.

UNIT PAVERS
Unit pavers when used shall be kept to a minimum. Setting method shall secure the pavers in place to prevent theft and vandalism.

TENNIS COURT SURFACES
• Use Textured acrylic surfacing for asphalt tennis courts and similar play areas.
• Surfacing shall conform to the Requirements of the ASBA for planarity.
• All surface coatings products shall be supplied by a single manufacturer.

Charleston County School District
Design Requirements for New Construction and Major Renovation
Release #03 - June 2016. Revisions to the text from the previous version are underlined and logged in Appendix B. 105
• The Contractor shall record the batch number of each product used on the site and maintain it through the warranty period.

• The installer shall be an authorized applicator of the specified system.

• The manufacturer’s representative shall be available to help resolve material questions.

• Do not install when rainfall is imminent or extremely high humidity prevents drying. Materials are to be only applied when ambient temperature is in compliance with manufacturer’s recommended installation specifications.

**ATHLETIC TRACKS**

• All running tracks (high school) shall be designed for 400 meters. High schools shall have eight (8) lane tracks. Track shall be marked per NFHS or SCHSL standards.

• Use Plexitrac Lightening Polyresin running track surfacing system, as manufactured by California Products Corporation as a basis of design. The mixture of specifically gradated rubber granules and Polyresin binders shall be placed over the accepted bituminous concrete base.

• No part of the surfacing installation shall be conducted during rainfall or when rainfall is imminent. After a rainfall, sufficient time shall be given to allow the surface to dry thoroughly. Materials are to be only applied when ambient temperature is in compliance with manufacturer’s recommended installation specifications.

**PLAYGROUNDS**

• Playground equipment shall be installed with a rubberized, ADA compliant surface. Size of surface shall be determined from playground design and equipment manufacturer’s minimum requirements. Access to playground equipment shall meet ADA requirements.

• Surface materials to meet or exceed standards set forth by the Consumer Product Safety Commission (CPSC) and shall be tested in accordance with procedures outlined by American Society for Testing and Materials (ASTM)

• Surfacing shall be permanently installed, made of poured or spread materials. Loose fill or tile surfaces are not allowed.

• Playgrounds shall be designed and constructed for the ages of children expected to attend the school/use the playground. The age groups for differing playground designs are 0-2 years, 2-5 years, and 5-12 years. Equipment selection preference shall be given to accessible features and play events.

• Playgrounds shall be accessible from the nearest access point/door and shall include one accessible ramp on to the playground.

• Posts and rails shall be constructed with powder-coated galvanized steel

• When possible, recycled materials shall be used for surfacing and equipment

• Shade structure(s) for play area shall be included in design, sized appropriately for the design of the playground and shall be rated to withstand 155 mph winds or wind design conditions at site, whichever is greater.

• Storm drains and catch basins shall not be permitted in the use zone of each piece of equipment.
IRRIGATION SYSTEMS

- The irrigation system shall be designed in accordance with the latest edition of the Irrigation Association & American Society of Irrigation Consultants “Landscape Irrigation Best Management Practices”.

- Permanent irrigation shall be defined as any underground irrigation systems. Temporary irrigation shall be defined as any above ground irrigation systems. Two wire systems are not allowed. The system must be compatible with current internet based control system.

- Permanent irrigation systems shall have the following:
  - System ground
  - Master control valve
  - Flow sensor connected to control unit
  - Two data drops to each control unit

- No wells and no retention ponds are permitted for service for irrigation systems.

- Irrigation systems can be installed to help establish plants for one year after the planting period but shall only be at the main, public entrance. The design team shall review the irrigation limits with Owner during the DD document review.

- Irrigation systems shall include piping, valves, sprinklers, sprinkler specialties, and controls.

- High School competitive sports fields, high school practice and band fields shall have permanent irrigation systems.

- Irrigation systems shall be metered separately from other site water use and utilize a backflow preventer.

- Maximum four (4) sprinkler heads per zone.

- All heads shall have adjustable swing joints and chrome sleeves.

CHAIN – LINK FENCES AND GATES

- Fencing in high profile areas shall be ornamental or 9 gauge black vinyl coated, class 2b, PVC coating that is thermally fused and adhered onto the galvanized steel wire.

- All other fencing including those for the sports fields shall be 9 gauge galvanized steel chain link fence and gates with all accessories, fittings, and fastenings.

- Fencing for playgrounds housing equipment designed for 0-2 year olds and 2-5 year olds shall be 4 feet tall and be placed a minimum of 5 feet beyond the use zone of any playground equipment.

- Height of all fence construction except playgrounds shall be a minimum of 6ft.

- Fabric of fence shall have knuckled selvage at both top and bottom. Do not extend fabric above the top rail.

- All fenced areas, unless specified below, must have 12 feet wide gates to allow for vehicular access. Fencing is required for security around exterior mechanical equipment areas, for security and at exterior sport functions including tennis courts and high school baseball and softball fields. No enclosure fence is required in Middle School Softball Fields, however, a 10 ft. high chain link backstop with a 5 ft. high foul ball screen set at 45 deg shall be provided.

- Mechanical equipment areas shall be enclosed with fence construction a minimum of 6 ft. high. Provide clearance around equipment as required for service and operation. Gates shall
be a minimum of 8 ft. wide utilizing double gate design. Where equipment enclosure fencing is adjacent to main buildings the fence construction shall match building construction.

- Tennis courts shall be enclosed with a 10 ft. high chain link fence with 4 ft. wide gates and wind screening.

- High School Baseball and Softball Fields shall be enclosed with a 6ft. high chain link fence with 14 ft. wide service and 4 ft. wide player gates. A fenced bull-pen area shall be provided. Crowd separation fences shall be 4 ft. high. A 12 ft. high chain link backstop with a 5 ft. high foul ball screen set at 45 deg. shall also be provided at softball fields. At baseball fields the backstop shall be 18 ft. high and the foul ball screen shall be 6 ft. high. Dugouts shall be a minimum of 8 ft. high and the fencing between the backstop wing and the dugouts shall be a minimum of 10 ft. high. All framework on backstops and hoods shall be welded. Outfield fence shall be installed with vinyl slats to match school color. Provide protective cover at top of outfield fences.

- Retention Ponds shall be fenced and have gates a minimum of 12 ft. to allow mowing equipment to service the banks.

- A perimeter fencing plan is required in accordance with Crime Prevention through Environmental Design concept of “territoriality”. The plan shall be approved by the Owner in writing.

**LANDSCAPING**

- The landscape maintenance budget and contracts are set up to edge, maintain turf, clean up in general. They are not set up to maintain beds or to replace mulch on a periodic basis.

- Specify safeguarding of all existing landscaping and monumental trees not identified to be removed due to the construction plans. Removal or damage to such protected areas, plants and trees shall result in chargeback from Owner and required replacement of similar landscaping features.

- Landscaping shall be minimal. Flower beds shall not be considered. A landscape plant list shall be included in the bid documents and project close out documents.

- At renovation/addition projects, the Design shall specify that the Contractor isolate and protect existing planting and lawn areas.

- Any devices such as stakes that are used to secure trees or other plantings shall be installed flush to the ground.

- Trees shall be provided with self-water devices and the contractor shall be required to keep them supplied with water as necessary to ensure survival of the tree during the warranty period.

- No existing trees shall touch the finished building or finished roof. Tree removal shall be evaluated based on full, mature canopy of tree species.

- The AE or Landscape AE shall strive for a Xeriscape design and select plants from commercially available native and adaptive species that thrive in the local climate without irrigation.

- All plants shall be native and non-invasive and shall be accompanied by a certificate stating “certified under all applicable state and federal quarantines.”

- Do not specify plants with thorns, thistles or toxic foliage, flowers or fruit.

- Specifications shall address submittals, quality assurance, delivery and storage, warranties, maintenance, general product requirements, and installation techniques.
• Owner shall review and approve landscape plan.

• Beds that require mulch use shall be minimized in all landscape designs and will be restricted the area around signs or at the front entrance only or as required by local municipalities.

• Landscaping shall not obstruct weep holes and/or storm drains and shall maintain proper slope for drainage away from structures. Only turf is allowed directly up to the building exterior.

PLANTING

• If permitted.

• All planted beds of any type shall have sterile top soil.

• No plants shall be planted closer than 4 ft. to the building, trees no closer than 15 ft. to the building. No trees shall touch or overhang the building or the roof. Tree placement shall be evaluated based on full, mature canopy of tree species.

• All shade trees shall be placed in a manner so that mature size limbs shall not touch or overhang buildings or power lines or encroach on adjacent trees. At driveway and parking areas all trees shall be at height at installation that they shall not obstruct motorists’ line of sight.

• Use triple shredded hardwood mulch for slope plantings and low visibility and outlying areas.

• Landscape with trees and/or shrubs when slopes in high visibility areas or slopes greater than 3:1 grade. Slopes of lesser grade can be seeded with Celebration Bermuda and irrigated to get them established. Where slopes exceed 5:1 grade, ground cover such as Parson Juniper shall be planted and mulched with a minimum of 3 inch compacted pine bark.

• Require tree/shrub protection fence that is placed at the drip line of the tree.

• Tree, shrub, and ground cover planting shall have a minimum of an 8 in. deep plant beds including 2 in. of decomposed organic matter. They shall receive an application of pre-emergent “herbicide” before area is mulched. A minimum of 3 in. of pine straw mulch shall be applied after herbicide. Islands in parking lots shall be mulched and shall not be planted with grass.

• All shrubs placed near buildings shall be selected from varieties so that at mature height of the planting shall not overgrow or obstruct vision from windows. At driveway and parking areas shrubs shall be selected from varieties so that at mature height of the planting shall stay below the motorists’ line of sight.

GRASS SEEDING

• Grass seeding shall not be permitted without Owner approval.

SODDING

• Sod shall be Certified Celebration Bermuda variety.

• Sod with netting or mesh not permitted.

• All rocks and debris to be removed prior to sodding.

• Areas immediately around the buildings and court-yard areas shall be sod unless areas are to be irrigated.

• Competitive athletic fields shall be sod
• Check slope, remove all foreign materials and stones larger than ½ in. Level soil and roll with heavy (250-300 lbs.) roller. Keep soil damp, not dry or wet, when it is worked. Alternately rake and roll area until foot marks cannot be seen readily or they are less than ¼ in. deep.

• Apply starter fertilizer at a rate that shall provide 1 to 1-1/2 lbs. of actual nitrogen/1000 sq. ft. Rake starter fertilizers into soil surface to about 1 in. deep and proceed with grass seeding. From time of seeding to substantial completion the Contractor shall keep maturing grass irrigated on a regular basis.

BUILDING EXPANSION AND RE-LOCATABLE CLASSROOMS

• The planning for future-building expansion and re-locatable classrooms shall consider grading, circulation patterns and utility stub outs.

• Require Mobile Classrooms to be located and installed in accordance with the OSF P&C Guide.

• Fire equipment access around the site will be an important aspect of structure location.
DIVISION 33 – UTILITIES

SPECIFY the following for Utilities

PIPED UTILITIES – BASIC MATERIALS AND METHODS

- Specify common pipe and utility materials and installation methods throughout project.
- Piping subject to freezing shall be provided with freeze protection.

INTERCEPTORS

- Coordinate with Division 22 – Plumbing.
- Concrete are acceptable.
- Interceptors shall be located outside the building.

SANITARY SEWERAGE

- Specify materials for sanitary sewerage outside the building as follows:
- Cast Iron shall be used under slab
- PVC schedule 40 for pipe and fittings less than 4 inches. For sizes 4 inches or larger, use ASTM D 3034, SDR 26 PVC.
- Top loading classifications of cleanouts shall be as follows:
  - Light Duty: In earth or grass foot traffic areas.
  - Medium Duty: In paved foot-traffic areas.
  - Heavy Duty: In vehicular-traffic service areas:
    - Extra-Heavy Duty: In roads.
  - Sewer Pipe Fitting and Riser to Cleanout: PVC to match pipe. Provide cast iron inspection cover and frame for cleanout.
- Specify quality control testing requirements of sanitary sewer lines to be performed by the Contractor. Report to be included in project close out documents.

SEPTIC TANK SYSTEMS

Specify tank, distribution box, and drainage pipe for septic tank systems. Use of Septic Systems is not permitted unless no possibility of a permanent sewer system is available in the area. If used, attain all permits and adhere to SCDHEC requirements in design and during construction.

SUBDRAINAGE

Specify foundation, under slab, plaza deck, retaining wall, and landscaping sub drainage systems as required by site soil conditions. Materials shall be as determined by the civil and structural engineers.

STORM DRAINAGE

- Storm water discharges and erosion control are covered by SCDHEC under the NPDES Permits.
- Retention ponds shall have banks constructed to accommodate deck mowers to service the banks. Aeration pumps are recommended in all retention ponds.
• Grated storm water inlets in grassed areas shall have a 36 inch wide concrete collar around the entire perimeter. The collar will start at grade and slope down to the inlet. The collar will be a minimum of 4 inches thick and be able to withstand the loads of lawn equipment.
Appendix A: Preferred Manufacturer’s

Division 03 - Concrete
Pre-Cast Architectural Panels
- Metromont
- Tindall
- OldCastle Precast

Division 04 – Masonry
- Bull-nosed concrete masonry units for use at pedestrian corners
- Provide products with Recycled Content and Regional Materials

Division 05 – Structural Steel Framing, Steel Joists, Steel Decking, etc.
- Handrails and railings in shall be fabricated from aluminum - coordinate finish with CCSD and Program Management.

Division 06 – Wood, Plastics, and Composites
Interior Architectural Woodwork
- Transparent Finished Casework; Casework shall be red oak and of a heavy-duty construction.
- Countertops; Plastic Laminate with marine grade plywood

Division 07 – Thermal and Moisture Protection
Metal Wall Panels
- No corrugated wall panels

Fiberglass Doors and Frames (FRP)
- Markar Architectural Products;
- Rebco Architectural Products
- Chem-Pruf Door Co.
- Special-Lite, Inc.

Overhead Coiling Doors
- Overhead Door Corporation
- Wayne-Dalton
- Cornell Iron Works, Inc.
- The Cookson Company

Overhead Coiling Grilles
- Overhead Door Corporation
- Wayne-Dalton
- Cornell Iron Works, Inc.
### Division 08 - Openings

### Door Hardware – Manufacturer Key Below

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*(FOR TEACHER TOILET USE ML2057 X D271)*
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**Manufacturer Key**

- **MK** - McKinney
- **PE** - Pemko
- **CR** - Corbin Russwin
- **RX** - Rixson
- **NO** - Norton
- **FA** - Falcon
- **HES** - Hes
- **RO** - Rockwood
- **LU** - Lund

Charleston County School District
Design Requirements for New Construction and Major Renovation
Release #03 - June 2016. Revisions to the text from the previous version are underlined and logged in Appendix B.
Division 09 - Finishes

Acoustical Panel Ceilings

Type 1 - Classrooms, corridors, break rooms, etc.
- Armstrong # 574
- USG # 76505

Type 2 - Administration areas, cafeteria, multi-purpose rooms and band/music rooms
- Armstrong Optima # 3352
- USG Halcyon ClimaPlus # 97221
- Minimum .90 NRC

Type 3 - Kitchens and food serving lines
- Armstrong Georgian # 794 Unperforated
- USG Vinyl Covered Sheetrock # 3260

Type 4 - Media Centers
- Same as Administration except use of USG Sandrift #808 w/.70 NRC is acceptable if design is used

Type 5 – Multi-Purpose Rooms (if used)
- Armstrong Armatuff # 861 with # 414 Retention Clips on 2 opposite sides of each panel
- USG Rockface ClimaPlus # 56335 with USG Retention Clips on 2 opposite sides of each panel

Ceiling Grid
- Grid and Wall Molding for ceiling types 1,2,4, and 5 shall be the following:
  - Armstrong Prelude # 7301 HD Grid and # 7808 2” Wall Molding. Molding # 7823 shall be used if a 2” shadow molding is used
  - USG Donn DX 26 HD Grid and # M20SM 2” Wall Molding. Molding # MS274 shall be used if a 2” shadow molding is used
  - Grid and Wall Molding MUST be by same manufacturer as ceiling panels to maximize warranty

- Grid and Wall Molding for Ceiling Type 3 shall be the following:
  - Armstrong Prelude Plus XL # HD8201 Grid and # 7808 2” Wall Molding
  - USG Donn DXLA 26 HD Grid and M20SM 2” Wall Molding

Resilient Wall Base
- Refer to District IDC for an approved list of manufacturers and installers which can be obtained by contacting the District Procurement Office

Resilient Tile Flooring
- VCT
• Refer to District IDC for an approved list of manufacturers and installers which can be
obtained by contacting the District Procurement Office

Rubber Floor
• Refer to District IDC for an approved list of manufacturers and installers which can be
obtained by contacting the District Procurement Office

Tile Carpeting
• Refer to District IDC for an approved list of manufacturers and installers which can be
obtained by contacting the District Procurement Office

Painting
• Sherwin – Williams
• Duron, Inc.
• ICI Paints
• Rose-Talbert
• PPG

Division 10 - Specialties

Electronic Digital Marquee Signs
  o Chipshow.
  o Daktronics
  o Daystar
  o Hyoco Distribution, Inc.
  o Optec Displays, Inc.
  o Suncoast LED
  o Watchfire

Operable Wall Panels
• Advanced Equipment Corporation
• Hufcor
• Modernfold, Inc.

Toilet and Bath Accessories
• Bobrick
• ASI
• Bradley
• General Accessory Mfg. Co

These Products must be specified with no exceptions
• Paper Towel Dispenser - Georgia Pacific Vista Hygienic Push Paddle Dispenser
• Soap Dispenser - Spartan Lite ‘n Foamy # 9751 Foam Dispenser
• Toilet Tissue Dispenser - San Jamar Reserva Jumbo Roll Dispenser #R3090TBK
• Warm Air Dryer Surface Mount or ADA compliant recessed mount – Saniflow Optima
• Automatic Hand Dryer

Division 11 - Equipment
Residential Appliances
- General Electric
- Hotpoint
- Maytag
- Whirlpool

Sound Systems
- Spectrum Sound LLC

Food Service Equipment
The following is an equipment list (Elementary Schools)
- Recessed Automated Touchless Towel Dispenser-Georgia Pacific enMotion MFG Part # 59466
### Equipment Schedule

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<th>Item No</th>
<th>Equipment Category</th>
<th>Manufacturer</th>
<th>Model Number</th>
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### Division 12 - Furnishings

#### Blinds
- By Owner

#### Site Furnishings
- By Owner

Charleston County School District
Design Requirements for New Construction and Major Renovation
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Division 13 - Special Construction
Division 14 - Conveying Systems
Hydraulic Elevators Only – No traction type elevators

- Minnesota Elevator, Inc.
- Thyssen Krupp
- Otis

Division 21 - Fire Suppression
Piping
- Wheatland Tube
- Allied Tube
- Northwest Pipe

Fittings
- Star
- Victaulic
- Viking

Division 22 - Plumbing
Valves
- Hammond
- Nibco
- Fairbanks

Pumps
- TACO
- Grundfos
- Armstrong
- Peerless

Meters and Gauges
- Ashcroft
- Palmer
- W.O. Trerice
- Taylor

Domestic Water Heater
- State
- Rheem
- PVI
- Lochinvar
• A.O. Smith

**Plumbing Fixtures and Trim**

**Fixtures**

• American Standard - if approved by owner
• Crane
• Eljer
• Kohler

**Flush Valves**

• Sloan Regal XL
• Sloan Royal

**Faucets**

• Chicago Faucets
• Zurn Plumbing Products
• T&S Brass

**Water Coolers**

• Elkay
• Halsey Taylor
• Acorn/Aqua
• Oasis

**Express Lavatories**

• Willoughby
• Acorn

**Division 23 - HVAC**

**Design Preferences**

• Water Source Heat Pumps
• Water Cooled Heat Pump Based Dedicated Outdoor Air Units with total heat – heat recovery and no auxiliary heat (will need aux heat on units without heat recovery). Units need water regulating valves to manage head pressure, variable speed fans, and variable speed compressors.

**Outdoor Air Units**

• Innovent Air
• Annex Air
• Munters
• Venmar
• Governair
• AAON
Water Source Heat Pumps
- Trane
- Daikin
- Florida Heat Pump
- Carrier
- ClimateMaster
- York (JCI)
- Lennox

Boilers
- Riverside Hydronics, Model Centauri Plus 1500MBH to 2000MBH
- Lockinvar
- Bryan
- Aerco
- Patterson Kelly

Cooling Towers
- Evapco
- B.A.C.
- Stainless Steel only, no Fiberglass towers will be considered.

Motors
- Westinghouse
- Wagner
- Century
- GE

Controls
- Siemens

Pipe / Fittings
- Wheatland Tube (Steel)
- Allied Tube
- Northwest Pipe
- Weldbend (Welded Steel Fittings)
- Cerro Tube (Copper)

Specialties Pumps
- B&G
- Taco
- Armstrong
Valves
- Hammond
- Nibco
- Fairbanks
- Stockham

Fired Hot Water Boilers
- Lochinvar
- Bryan
- Aerco
- Patterson Kelly

Factory Fabricated Evaporative Cooler
- Evapco
- BAC

Packaged Air Cooled Heat Pump Units
- Trane - Basis of Design
- Lennox
- Carrier
- York (JCI)
- AAON
- Daikin

Air to Air Split Systems
- Trane – Basis of Design
- LG
- Daikin
- Mitsubishi
- Lennox
- Carrier
- York (JCI)

Division 26 - Electrical

Low Voltage Transformers
- Eaton
- GE
- Square D
- Siemens

Switchboards and Panelboards
- Eaton
Wiring Devices
- P&S
- Hubbell
- Bryant
- Arrow-Hart

Enclosed Switches
- Eaton
- Square D
- GE
- Siemens

Enclosed Electrical Shut Down
- Remote Electrical Power Shut down station shall be Knox-Vault #4500 and be recessed mounted with alarm tamper switch.

Package Generator Set
- Caterpillar
- Cummins
- Kohler
- Detroit Diesel

Automatic Transfer Switches
- Russell Electric
- ASCO
- Zenith
- Caterpillar
- Cummins

Transient Voltage Suppression
- Innovative Technology
- Liebert
- Datak
- Eaton
- Square D
- GE

Lighting Fixtures
- Cree

Charleston County School District
Design Requirements for New Construction and Major Renovation
Release #03 - June 2016. Revisions to the text from the previous version are underlined and logged in Appendix B.
- GE
- Philips

**Lighting Controls**

- Leviton
- Lutron
- Lithonia
- Watt Stopper
<table>
<thead>
<tr>
<th>No.</th>
<th>Section</th>
<th>Pg.</th>
<th>Comment / Issue</th>
<th>Current Language in DR</th>
<th>Proposed Language for DR</th>
<th>Action Taken for Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Appendix A Div. 10: Specialties, Toilet and Bath Accessories</td>
<td>119</td>
<td>ADA compliance for hand dryers</td>
<td>Warm Air Dryer Surface Mount – Saniflow Optima Automatic Hand Dryer</td>
<td>Warm Air Dryer Surface Mount or ADA compliant recessed mount – Saniflow Optima Automatic Hand Dryer</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>2</td>
<td>Div. 27: Communications, General Requirements</td>
<td>100-101</td>
<td>Inclusion of IT Requirements in June 2016 Release</td>
<td>None - Section 27 Communications was left for future versions</td>
<td>Section 27 was added to the Requirements. Read Section 27 for Language.</td>
<td>Language provided by CCSD IT was added to DR for June 2016 Release.</td>
</tr>
<tr>
<td>3</td>
<td>Div. 22: Plumbing, General Requirements</td>
<td>75</td>
<td>Size of paper towel dispensers in single toilet elementary school. ADA hand rail is interfering with Towel Dispenser</td>
<td>None</td>
<td>Jumbo roll toilet paper dispensers shall be located in a wall recessed open faced stainless steel cabinet that runs from the floor to 1.5 inches below the horizontal grab bar. It shall be sized so that the toilet paper can easily be changed.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>4</td>
<td>Div. 26: Electrical, General Requirements</td>
<td>93</td>
<td>Electrical Testing is Insufficient</td>
<td>None</td>
<td>General Contractor shall provide for TEGG testing of the electrical power distribution system and provide documentation to the owner of the following tests: NFPA 70 compliance, Infrared Thermography, Ultrasonic Testing, De-Energized Testing, Energized Testing, Voltage and Ampere Diagnostics, Proper Torqueing. The TEGG inspection shall be performed by an independent 3rd party electrical contractor certified by the TEGG Service Corporation.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>5</td>
<td>Div. 09: Finishes, Flooring</td>
<td>48</td>
<td>Art Room floors not durable enough</td>
<td>None</td>
<td>Art Rooms: Unsealed polished and sealed concrete - non skid</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
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<tr>
<td>7</td>
<td>Part 1: Overview &amp; Requirements by Project Phase, Sustainability</td>
<td></td>
<td>Remove Silver LEED Certification Requirement</td>
<td>&quot;Draft LEED 2009 v3 Scorecard for Silver Certification&quot; in Division 01 Commissioning Requirements</td>
<td>Draft LEED 2009 v3 Scorecard for Certification</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>8</td>
<td>Div. 26 Electrical, Grounding</td>
<td>94</td>
<td>More specific direction regarding Grounding Requirements</td>
<td>Impedance shall be Tested in Grounding Section</td>
<td>Ground main service by exothermic welding the grounding conductor to main cold water pipe, building steel, footing rebar, and at least three 3/4&quot; diameter x 10' long ground rods driven 10' apart outside building in unpaved earth. The rods shall be loop interconnected with each other by a minimum No. 500 MCM AWG bare copper conductor thermal welded, using the proper style mold, to each rod below grade. Electrical Contractor shall provide designer of record with written documentation that service grounding system resistance measures no more than 5 ohms. Measurements shall be made using The Fall of Potential Method. Supplemental grounding electrodes and / or soil supplements shall be installed as necessary to achieve the specified resistance's.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
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<tr>
<td>9</td>
<td>Div. 26 Electrical,</td>
<td>98-99</td>
<td>Clarification</td>
<td>Emergency lighting shall be LED type, battery operated, wall mounted multi head, adjustable emergency lighting pacs (except on schools where emergency generators are provided. 2x4 Fluorescent light fixtures with battery packs are not acceptable)</td>
<td>Emergency lighting shall be provided by dedicated low wattage LED fixtures. They shall be powered from small wall mounted battery operated inverters located in the electrical rooms. Inverters shall be designed with 20% spare capacity and shall be arranged to minimize the number of batteries. 2X4 Fluorescent light fixtures with battery packs are not acceptable</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>10</td>
<td>Appendix A Div. 11: Food</td>
<td>120</td>
<td>none</td>
<td>none</td>
<td>Recessed Automated Touchless Towel Dispenser-Georgia Pacific enMotion MFG Part # 59466</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>11</td>
<td>Div. 22: Plumbing,</td>
<td>74</td>
<td>Request for a staff bathroom in the Teacher Room for Jennie Moore and Carolina Park</td>
<td>none</td>
<td>Pending funding availability, add a staff bathroom to Teacher Rooms</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>12</td>
<td>Div. 33: Utilities,</td>
<td>112</td>
<td>Design at Academic Magnet HS</td>
<td>none</td>
<td>Grated storm water inlets in grassed areas shall have a 36 inch wide concrete collar around the entire perimeter. The collar will start at grade and slope down to the inlet. The collar will be a minimum of 4 inches thick and be able to withstand the loads of lawn equipment.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>13</td>
<td>Div. 05: Metals</td>
<td>33</td>
<td>Issues with Exterior Metal Panels. Aluminum Composite</td>
<td>none</td>
<td>Exterior Metal Panel shall be located a minimum of 8 ft. above ground level. Aluminum Composite Panels shall not be used.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>14</td>
<td>Div. 26: Electrical</td>
<td>98</td>
<td>Failures of recessed lighting in exterior location and sidewalks</td>
<td>Exterior lighting in stairways and sidewalks shall be flush mounted and easy to access for maintenance. Recessed lighting in concrete is not permitted.</td>
<td>Exterior lighting in stairways and sidewalks shall be flush mounted and easy to access for maintenance. Recessed lighting in concrete is not permitted.</td>
<td>Schindler Removed from Approved Manufacturers of Hydraulic Elevators - Appendix A</td>
</tr>
<tr>
<td>15</td>
<td>Appendix A: Approved</td>
<td></td>
<td>Delete Schindler from list due to proprietary software</td>
<td>Schindler Listed as approved Manufacturer for Hydraulic Elevators</td>
<td>none</td>
<td>Schindler Removed from Approved Manufacturers of Hydraulic Elevators - Appendix A</td>
</tr>
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<tr>
<td>16</td>
<td>Div. 8: Openings, Doors</td>
<td>44</td>
<td>Add Stainless Kick plate to exterior face of hall doors to protect them from floor equipment damage.</td>
<td>All doors off hallways, corridors, and stairways shall have non corrosive material kick plates. For main exit doors, kitchen, storerooms, and other doors subject to heavy use, specify extra-large kick plates.</td>
<td>All doors off hallways, corridors, and stairways shall have stainless steel kick plates. For main exit doors, kitchen, storerooms, and other doors subject to heavy use, specify extra-large stainless steel kick plates.</td>
<td>Current Language in DR edited to change &quot;non-corrosive material&quot; to stainless steel.</td>
</tr>
<tr>
<td>17</td>
<td>Div. 12: Furnishing</td>
<td>70</td>
<td>Durability</td>
<td>none</td>
<td>See Requirements - Added Section for Audience Seating</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>18</td>
<td>Div. 10: Specialties, Operable Panel Partitions</td>
<td>61-62</td>
<td>Durability, Sound</td>
<td>Same as proposed with a few edits</td>
<td>Change Operable Panel Partitions to Operable Wall Systems. Add requirement that panel walls be primed steel and meet minimum acoustical performance requirements of STC 53.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>19</td>
<td>Div. 09: Finishes, Acoustical Panel Ceilings</td>
<td>50</td>
<td>Durability</td>
<td>Same – added “square edge”</td>
<td>Acoustical Panel Ceilings shall be manufacturers standard lay-in panels, 24 in. X 24 in. grid size panels, square edge, with white finish.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>20</td>
<td>Div. 10: Specialties, Special Security Signage</td>
<td>57</td>
<td>Change Verbiage</td>
<td>NOTICE ALL VISITORS ARE SUBJECT TO SEARCH PURSUANT TO SOUTH CAROLINA CODE 59-63-1110</td>
<td>NOTICE: PERSONS ENTERING CAMPUS ARE SUBJECT TO SEARCH PURSUANT TO SOUTH CAROLINA CODE 59-63-1110.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>21</td>
<td>Div. 10: Specialties, Special Security Signage</td>
<td>57</td>
<td>Delete Verbiage</td>
<td>Decal 3: OFFICE: a. RING BELL AFTER HOURS b. SECURITY CAMERAS ARE IN USE, BUT MAY NOT BE MONITORED AT ALL TIMES.</td>
<td>Decal 3: OFFICE: SECURITY CAMERAS ARE IN USE, BUT MAY NOT BE MONITORED AT ALL TIMES.</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
<tr>
<td>22</td>
<td>Part I: Overview &amp; Requirements by Project Phase, Executive Summary and Document Footer.</td>
<td>All Pages and page 4</td>
<td>Add Language regarding notating revisions from the previous version</td>
<td>none</td>
<td>Executive Summary: Updates to these Design Requirements are at the discretion of the District. Revisions to the text from the previous version are underlined herein and logged in Appendix B: Design Requirement Changes Log. (Footer has an abbreviated version of this message on the bottom of every page.)</td>
<td>Proposed Language added to DR for June 2016 Release</td>
</tr>
</tbody>
</table>