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INTRODUCTION

These Guidelines have been developed to assist the Designer-Engineer in the planning and design of functional, cost effective and durable educational facilities that are attractive and enhance the educational experience for students. Designers are encouraged to develop the attractiveness in a straightforward manner by utilizing standard building materials and details with a minimum of ornamentation and special treatments. Highest priority should be placed on the development of the interior learning environment with full attention given to the development of appropriate casework, outlets, lighting, etc.

The Guidelines incorporate experiences and lessons learned from past building improvement programs and have been organized in accordance with CSI's MasterFormat 2004. They are not intended to limit or control opportunities for innovative design but rather to assist the Designers in understanding certain planning requirements, design criteria, and concern items regarding reduction of energy consumption. Nevertheless, whenever the design of facilities varies from the requirements and considerations of the Guidelines, the Designer shall obtain prior approval in writing from the Owner.

Please note that separate Educational Specifications and Building Programs listing detailed space and equipment requirements will be issued for each building project. In event of any conflict between the two, contact CCS Facilities for clarification.

The Design Guideline portion of the document is presented in four (4) major sections. The first section is the introduction and overview of the document. The remaining sections are organized to follow generally the process of a project from inception through Construction documentation.

Section 2 addresses the specific architectural program requirements for each of the three levels of schools that are being constructed by CCS as well as unique aspects of project development like site selection, and Exceptional Children's classroom needs and gives a broad overview of design parameters in terms of program requirements. A "story board" is included as a graphic representation of the design and construction process from beginning to end.

Section 3 more specifically focuses on the various design features and general building material and product requirements found in a typical school facility, considerations to be taken into account in the Schematic Design Phase. This portion of the document is organized to follow the Construction Specifications Institute (CSI) format and division numbering system relating to the specification standards in Section 5.

Section 4 is the general conditions that apply to a project and reside over the Project Specifications.

Section 5 is the standard specifications for materials that provide the specific product information in terms of type, quality, performance etc.

These Guidelines should be of great benefit to Designers as well as the Owner. The entire design and construction process will be strengthened and less complicated if all concerned utilize the Guidelines at each phase of project design and approval. These Guidelines will continue to evolve through the Owner's experience and desire to improve projects; therefore your comments and recommendations are invited for future revisions.

Please follow the attached policy concerning procedures for changes to recommend as revisions to this document.



REQUEST FOR REVISION PROCEDURE

PURPOSE

The Design Guidelines are considered by Cabarrus County Schools as a dynamic document that continues to evolve as new and better technology becomes available for the construction industry. The Facilities Department welcomes opportunities to review new information on existing product and new products or materials and offers those would like to submit changes a venue in which to proceed.

SUBMITTAL PROCESS

All material for consideration shall be submitted to the Manager for Cabarrus County Schools Facilities and Operation Department (CCS). The initial information shall be submitted on the attached form and the form shall be completed in its entirety. Additional information can be submitted to help better understand the request as backup information, for comparisons or as required to substantiate specific information.

RESPONSIBILITY OF THE MANAGER

The Manager upon receipt of the completed form and any additional backup information shall notify sender that the information has been received and the expected time frame for the review to take place within 10 days of receipt. It is the intent of CCS to expedite the review process in a timely manner; however back log and complexities of the information shall determine the timing of the review. It will be the intent of the Manager to review all material submitted without prejudice and to seek other qualified help should the information level exceed their understanding of the submittal. The Manager shall have the opportunity to request additional information if the submittal provided does not have enough information to determine a response. On occasion the Manager may also request that the submitter be available to present or demonstrate the need for change in person to a group of individuals representing CCS.

ACCEPTANCE/REJECTION OF SUBMITTED MATERIAL

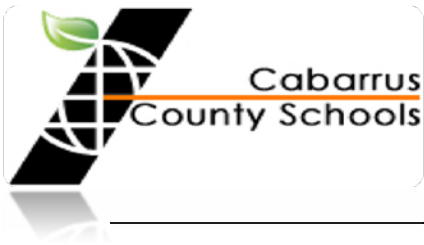
The Manager will, upon conclusion of the review process, notify the submitter of the outcome of the review. The outcome of the review will be: rejection, approval on a trial basis, or approval. In the event the submitted information is rejected by the Manager, a letter from the Manager will be issued outlining the reason for rejection. Materials that are rejected cannot be resubmitted for consideration for at least two years from the date of the first submission. All decisions by the Manager are subject to appeal. If an appeal is requested, the Director of Facilities and Operations will review the merits of the appeal on a case by case basis.

APPROVAL ON A TRIAL BASIS

If the submitted information is approved on a trial basis, then the information is approved for a specific project only. A letter will be issued outlining the reason for the acceptance on a trial basis. At the end of the one year walkthrough, the Manager will evaluate the merits and results of the decision and either reject or accept the proposed revision.

ACCEPTANCE

If the submitted information is accepted by the Manager and CCS a notification by the Manager will be sent to the submitter explaining the reason for acceptance and a date the revision that would incorporate the change to the Design Guidelines will be completed. Until the change is incorporated and a revision to the Design Guidelines is duly noted, the revision cannot be incorporated on current or future projects for Cabarrus County Schools, with the exception of the approval on a trial basis, referenced above.



REQUEST FOR REVISION – SUBMITTAL FORM

SUBMISSION DATE ___/___/___ SPECIFIC PROJECT

GUIDELINES SECTION TITLE _____

SECTION # _____

PAGE(S) _____ LINE(S) _____

PROPOSED CHANGE

JUSTIFICATION

COST BENEFIT ANALYSIS

SUBMITTED BY:

NAME _____

ORGANIZATION _____

EMAIL ADDRESS _____ FAX # _____

PLEASE ATTACH A PHOTOCOPY OF THE RELEVANT PAGES(S) UNDER CONSIDERATION AND INCLUDE INFORMATION IN SUPPORT OF YOUR PROPOSAL. SUBMIT A SEPARATE FORM FOR EACH REVISION REQUESTED



GENERAL CONDITIONS AND REQUIREMENTS

The Contractor is responsible for all work in the Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections.

The following is a list of conditions and requirements gathered from previous CCS projects. This information will be made clear and will be included in the Standard Form of Agreement between the Contractor and the Owner, the General Conditions of the Contract, Supplemental Instructions or Division 01 – General Requirements for all CCS projects.

Contact the CCS Construction Department for guidance or questions.

General

Within seven (7) days after any portion of the Work has received roofing, The Contractor will secure that portion of the Work with lockable door units and window enclosures. Should lockable doors not be available for installation at this time, provide temporary means such as plywood to secure all openings for a secure area. Provide at this time, and for the duration of the Project, someone to arrive 1/2 hour before starting time and remain 1/2 hour after quitting time to unlock and lock the building or building areas.

Work found not to be in compliance will be immediately corrected at The Contractor's expense.

The Contractor will remove and dispose of all suitable and unsuitable excavated soil from footing excavations trenching, grading operation or other on-site work to a location offsite. No unsuitable soils shall be used in engineered fill areas. All suitable soil materials maintained for backfill which will be stockpiled and properly protected in an area designated by the Owner's Representative. The Contractor will designate a location on site for the stockpiling of excess excavated soils for backfill purposes resulting from mechanical, electrical and plumbing excavations. The Contractor shall remove & dispose of remaining materials not used for on-site work to a location offsite, unless otherwise indicated.

The contractor shall furnish and install security fencing for the project as shown on the plans. The fence shall be a min. 6-ft high chain link fence with 14-ft gate(s) and 3-t pedestrian gate(s). The Contractor will also be permitted to install fencing for a security compound on the job if available in coordination with the Owner. All fencing shall be without defect (i.e. no holes, ragged edges, etc.) and include top and bottom rails since students may be in direct contact with the fencing. In areas where direct contact will be with students, Contractor shall install knitted privacy fabric over chain link fence on the side exposed to the children.

The Contractor shall install and maintain the temporary water service on the site. Protection from freezing shall be provided as needed to maintain site water supply. The Contractor will include in his bid the cost of all water and sewer tap fees. The initial

temporary meter rental fee, if any, will be paid for by The Contractor. All consumable water and monthly meter rental (following the initial tap or temporary meter setting) shall be paid for by The Contractor. The Contractor shall include off-site temporary water line extension. Where available the Contractor shall have the option to use one of the irrigation wells for temporary water.

Temporary and permanent gates and signage will be provided as part of the Contract.

The Contractor is responsible for protection, repair, and final cleaning of the asphalt paving. The Contractor is also responsible for repair and/or replacement of any curbs damaged during the extent of his contract.

All tap fees, meter fees, and impact fees will be included in the Contractors bid.

The Contractor shall assume all responsibility for determining if existing contours are in conformance with information indicated on the drawings. This Contractor shall notify the Architect prior to starting operations if material any discrepancies are found. Once work begins, The Contractor, by his actions of beginning work, shall forfeit his right to make any and all claims for existing conditions being materially different from those shown on the drawings.

During the course of construction, The Contractor will be responsible for the cleaning of roadways adjacent to the project which became contaminated with construction debris, mud, etc., as a result of The Contractor forces or those of other contractors. Contractor should include a truck wash meeting CDOT standards at the construction entrance.

Cleaning of all paved areas is part of The Contractor's scope of work.

The Owner will employ and pay direct and independent laboratory to perform all soil, density, compaction, and construction material testing requirements. The Contractor is to notify the Owner's testing lab Representative of the need for testing at least 24 hours prior to the need for testing a particular area. This area must be of sufficient size to justify the cost of the testing involved. Lab technician's timesheet must be signed by The Contractor verifying when services start and complete. The Contractor will bear the cost for all standard and modified proctor tests on borrow pits.

All site utilities that provide service to adjacent properties must remain operational during construction.

The Contractor will provide "As-Built" survey information to the Architect upon completion of each phase of the Work.

Cost for electrical power consumed during the course of construction will be paid by The Contractor from the commencement of the Work through to Substantial Completion. Refer to the General Requirements for temporary heating requirements.

At Notice to Proceed the Contractor will commence any work not requiring a building permit (example: purchases, shop drawings, etc.).

The Contractor will run and connect water and sanitary drainage lines to all equipment.

The Contractor will provide for the protection of any existing sanitary drainage (interior) during construction and verify and coordinate the condition of the drainage with the Owner's representative.

The Mechanical System is to be operated to maintain building temperatures required for construction as soon as the system is operational, but not later than the HVAC startup date noted in the schedule. The Contractor's Mechanical Contractor is to provide and install air filters in all equipment prior to it being operated during the construction period. The Mechanical Contractor is to change these filters as required to protect the equipment and its warranty and to permit efficient operation. The Mechanical Contractor shall provide an extra set of filters and install new filters for final inspection. The Mechanical Contractor shall extend the warranty to cover the temporary use of the equipment. The Mechanical Contractor shall include in his price an additional 24-months preventative maintenance service which will occur twice a year at start up of heating and cooling. The Mechanical Contractor shall coordinate the services with CCS Facilities.

The Contractor shall furnish, install and maintain temporary power and lighting in accordance with the documents. All temporary power sources and temporary lighting must be maintained operable by The Contractor for the duration of the project or until the permanent system is operable.

Exterior temporary lighting necessary to perform work should be directed so it will not illuminate adjacent residential neighborhoods.

The Contractor's electrical subcontractor will be required to identify, properly handle, store and dispose of all PCS containing ballasts and mercury containing lamps according to applicable local, state and federal regulations. These items shall be considered hazardous waste and shall be disposed of by hazardous waste incinerator or ballast/lamp recycling facility. A record of all PCB containing ballasts and mercury containing lamps removed shall be maintained by the Contractor. The record shall indicate disposal and recycling vendors used along with dates of transfer. The record shall be turned over to the Owner at the completion of the project.

The Contractor will furnish and install a 4' x 8' job sign. Sign format will be as required and as shown on the Contract Documents.

An independent 3rd party firm paid for by the Contractor will perform two camera inspections of all sanitary lines to insure lines are undamaged and there is proper installation, adequate slope, etc. Video inspections will be done: a) following completion of the slab work, b) following completion of all sanitary system installation. The 3rd party will issue a report along with video tape data of all lines. Any deficiencies will be identified and their location will be clearly indicated on a site drawing attached to the report. The report and all video tape information will be reviewed by the Mechanical Engineer and the CCS Plumbing Department prior to acceptance of the sanitary lines.

The Contractor must have a Supervising Manager onsite any time any of their employees, vendors, or subcontractors onsite or working.

The Owner/Owner's Representative may attend any and all Contractor meetings held onsite (at their discretion).

The Owner and/or the Owner's Service Providers may modify any computer programs supplied as part of this contract without voiding the warranty (fire alarm, security, HVAC controls, etc.).

When any deficiencies noted on the project are corrected, the Contractor shall notify the Architect and the Owner's Representative to allow for reinspection prior to the work being covered up.

The Owner or Owner's Representative will be allowed to talk to any worker onsite at any time provided that they do not direct the Contractor's forces or work.

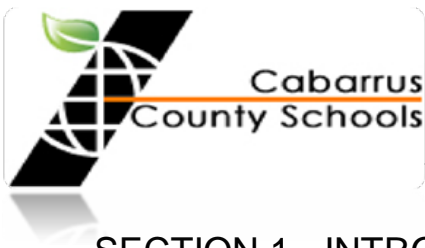
The intent of the contract documents is to require The Contractor to provide all items necessary for the proper execution and final completion of the work. It is understood that all items, materials, equipment, etc. are to be furnished and installed complete and ready for operational use. The Contractor understands that the work shall be complete in every detail necessary to produce the intended result notwithstanding the fact that every item involved is not particular mentioned or shown.

The Contractor, its subcontractors and its vendors shall be responsible for all drawings and specifications and they shall be responsible for coordinating with all contract documents. The Contractor, its subcontractor and its vendors shall not be relieved of not having coordinated with each other and other trades, drawings, specifications, submittals, etc.

Reference Specification Section 01 78 39 - The Contractor shall submit red-lined set of as-built drawings to the Architect of record for verification who will in turn submit the set to the Owner for their records. The Contractor shall submit a PDF file with the aforementioned drawings.

Add an Item number to include dust control measures during construction by the Contractor.

Add information regarding pre-purchased equipment.



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DESIGN GUIDELINES AND STANDARD SPECIFICATIONS

EXECUTIVE SUMMARY

Over the course of the last ten years Cabarrus County Schools (CCS) and its School Board have made a concentrated effort to build twenty-first century school facilities. These efforts have led to quality schools that incorporate that have improved energy efficiency, improved advances in technology and are educational environments that are exciting places to grow and work.

During the last two rounds of construction, the School Board also decided to utilize prototypical or "clone" designs. This effort was based in part on recommendations from the North Carolina Department of Public Instruction (NCDPI). There are clear benefits to this design approach which have led to a number of schools being built quickly using the same plans at a reduced cost for architectural and engineering fees. The drawbacks have been the inability to respond to change in these schools to new educational teaching methods that have evolved during the course of their development. The cloned schools have limited flexibility for change overall and if a product or design idea tended to not be the best idea, it often took more than one generation of cloned school to correct this shortcoming.

In an effort to create an effective design process the CCS began using a set of design guidelines that included a good deal of standard architectural program information taken from previous projects and the NCDPI recommendations for elementary, middle and high school facilities. The majority of this information however had limited review by teachers and school managers and actual design decisions related to these standards tended to be made by the assigned project architects, Board of Education members who were assigned to design teams for each school type and CCS management staff.

The development of a detailed architectural program with appropriate adjacency diagrams for each building type is the next step in the development of the design guidelines. These can be developed by staff within the organization if the discussions are facilitated by the CCS Director of Construction or by a consultant knowledgeable in this area of work. These efforts would also require the involvement of groups of staff for the various building types who can assist in establishing all the specific space needs that would be a part of the design of a new elementary, middle, or high school facility. Adjacency diagrams would require that same level of development to ensure that the correct relationships between spaces, departments, and the whole school are accurately reflected in the documents. All of this information will aid the next set of architects and engineers that are employed to design a new school for CCS and act as detailed directives or guidelines for that design team to use.

The limitations of this process are that the users of the school facilities, who were actually living with the physical solutions of these efforts, did not have a great deal of input and often times were simply not asked the right questions. Post occupancy evaluations, if conducted, were limited in scope and any information gleaned from these evaluations did not typically get incorporated in the next round of building designs. Teaching staff that did participate in design reviews and/or post evaluation processes typically were not able to read plans and specifications very well and assistance for them was limited. They also could not respond effectively to questions posed by the design

team because of a real lack of understanding of what was being asked of them. Thus, decisions that came out of this limited exchange of information resulted in design solutions that lacked real world vision. In some cases classrooms and support spaces were reduced in size to save space and reduce construction costs at the expense of flexibility and usefulness in the future. New concepts in planning schools should also be considered as having the need to alter these guidelines and specifications. Such issues as designing for “magnet” schools or “museum” schools are certainly real possibilities and could be so unique in their space programming needs that they would require a complete restructuring of these requirements. Also, the potential need to substantially expand and reuse portions of existing schools for new purposes would also add a new element to the design guidelines.

The introduction of complete flexibility into schools for information technology (IT) that can support and adapt to ever changing new developments in teaching tools is extremely important. The trends in IT must be reflected in the sections on these elements of a building within the guidelines and specifications and address wireless accessibility, “cloud” servers, Smartboards with interactive software, hand-held technology devices for students at most levels, as well as “schools without walls” for distance learning.

The design process that utilizes these guidelines and specifications and ultimately helps to update them should be an “interactive” design process that engages the end users, CCS management staff, architects, building systems engineers, sustainability designers, IT staff and contractors. It must be a process that is inclusive and challenges all team members to ask every question so that all members understand them and can contribute in a meaningful way to the design process. Introduction of the use of Building Information Modeling (Revit) software for the creation of user friendly and integrated design and construction documents will also need to be a part of the process as well. This will help to improve the quality of the documents, ensure better integration and efficiency of all systems and reduce conflicts among the various trades in the field during construction. A spin-off benefit is the potential for three dimensional perspectives and fly-through videos of the projects during the design development process.

The initial design guidelines included a list of preferred products and vendors that CCS likes to use in order to ensure operational and maintenance problems in the new schools. These products and vendors have proven to be reliable and as a result maintenance staff is trained on how to use and/or repair the items, useful life expectancy is excellent and CCS Facilities and Operations maintains a stock of replacement parts so that repairs can easily be made in a timely manner. This is extremely important in a school system where loss of use of a building due to product or system failure is unacceptable.

The Design Guidelines and Standard Specifications should be viewed as a “living document”. Changes in applicable code requirements, NCDPI recommendations, improvements in materials and products or new ways of educating students or delivery methods of information by teachers may require the modification of the guidelines or specifications. Any of these things that impact the document should be addressed through updates to the document.

The Design Guideline portion of the document is presented in two (2) sections. The first section addresses the specific architectural program requirements for each of the three levels of schools that are being constructed by CCS as well as unique aspects of project development like site selection, and Exceptional Children’s classroom needs. The second section focuses on the various building materials and products found in a typical

school facility and the CCS desired design features related to each of those materials and products. This portion of the document is organized to follow the Construction Specifications Institute (CSI) format and division numbering system.

These design requirements should not be taken for granted and detailed architectural programming should also be considered for all projects as an additional architectural service. Without this important service, the potential to customize the building design to the specific needs of the users and the project could be lost.

The last portion of the document is a series of standard specifications that provides architects and engineers with outline performance specifications for products and materials that the school system would like used in its school projects. In certain cases a limited number of acceptable manufacturers are listed as examples of the level of quality or performance that is expected.

In all cases the directives established in these guidelines and standard specifications are to be provided to any architect or engineer that will be designing a school building project for CCS. They are not subject to interpretation or selected application. However, the architect or engineer will be expected to determine if any recent code or NCDPI recommendations would impact these guidelines and/or specifications and bring those issues to the attention of CCS staff for clarification.

The Standard Specifications portion of the document also follows the CSI format and numbering system. These specifications, as noted above, give direction to the architect and engineer as to what products, materials and manufacturers are desired in all school projects by CCS.

There is also a new section on sustainable design that brings attention to the need for all school building projects to be designed with the intent of having a zero based carbon footprint. This means that each of the buildings should incorporate design elements, building systems features and also material choices that enable the building to save as much energy as it consumes thereby having a zero impact on the environment through a reduction in overall energy use for the life of the building. These concepts will not only improve the learning environment through the use of daylighting, water conservation, more energy efficient mechanical systems, more efficient lighting selections and conservation of rain water. They will provide the means by which to teach children the importance of conservation and energy efficiency in their own lives as well.

The work that it took to create this document could not have been accomplished without the expert consulting services of Perkins Eastman Architects along with the input of a large number of CCS staff, Board members and other individuals. These acknowledgments are provided in a separate section of this document.

It is with great enthusiasm and after months of interviews, discussions and reviews that all of these individuals along with the staff of the CCS Construction Department are proud to submit the 2010 CCS Design Guidelines and Standard Specifications.



ACKNOWLEDGEMENTS

This living document reflects a wide range of participation and a means of achieving consistency in the future of building Cabarrus County Schools.

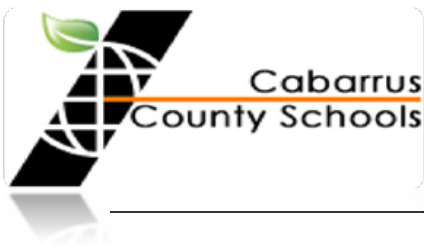
Cabarrus County Schools would like to thank those who participated and volunteered their time and efforts to the development of the Cabarrus County School's Design Guidelines and Specification Standards.

Cabarrus County Schools

Wayne Williams, Chairman of the Board of Education
Holly Blackwelder, Board of Education Board Member
Dr. Barry Shepherd, Superintendent
Jim Amendum, Associate Superintendent of Administrative Services
Scott Barringer, Athletic Director
Kristine Bartley, Administrative Assistant
Lee Connellee, Construction Project Manager
Kevin Crisco, Electrical Technician
George Douglas, former Director of Transportation
Tina Farmer, Child Nutrition Director
CJ Intintoli, Construction Quality Manager
David Jones, Locksmith Services
Robert Kluttz, Director Driver Education and School Planning
Jerry Lambert, Housekeeping Specialist
John Owenby, Manager of Grounds
Dr. Kelly Propst, Assistant Superintendent of Technology and Accountability
Joe Sides, Director of Facilities and Operations
Stephan Smith, Manager of Electrical and Carpentry
Donna Smith, Executive Director of Student Services
Ward Smith, Manager of Health and Safety
Michael Stocks, Technology Manager
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 Jim Amendum
 Kevin Crisco
 Michael Stocks
 Andrea Palo
 Cindy Fertenbaugh

Architects

MBAJ Architects
Morris Berg Architects
Perkins Eastman Architects



GLOSSARY OF TERMS, STANDARDS AND ABBREVIATIONS

DEFINITIONS

Throughout this guide, mandated requirements are differentiated from recommendations or commentary as follows:

1. Mandates: Indicated by use of “shall”, “will”, “use”, or “shall not”, “do not”.
2. Recommendations or commentary: Indicated by words or phrases such as “should,” “may,” “it is recommended” and the like. Any such words or phrases indicate an option that is to be decided by the Designer.

“Owner”: Cabarrus County Schools

“CCS”: Cabarrus County Schools

“Architect”, “Designer” and “Engineer” refers to a professional, registered to practice in North Carolina. “Architect” and “Designer” are synonymous.

“Contractor” and “General Contractor” refers to the company that is constructing or renovating the school. Since the contractor will not read this Guide, the Designer shall convey all such references to the contractor in the contract documents. “Contractor” and “General Contractor” are synonymous.

“Agreement” and “Contract” are synonymous.

“Approved”: Used to convey Architect's, Owner's or Project Manager's action on Contractor's submittals, applications, and requests.

“Directed”: A command or instruction by Architect or Project Manager. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."

“Drawings” and “plans” are synonymous.

“Indicated”: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

“Regulations”: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

“Install”: Operations including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations, including coordinating with other Contractors.

“Provide”: Furnish and install, complete and ready for the intended use.

“Project Site”: Space available for performing construction activities.

“LEED Consultant” or “LEED Coordinator” refers to person or company contracted or appointed to coordinate the documentation for LEED certification of the building.

“Relocate”: Move from the existing location to a new location and installed complete and ready for use.

“Coordinate”: Cooperate with related trades to provide the components of the Work in correct sequence, size, and location to create a complete system ready for intended use.

"Verify": Measure, investigate, review, test, check the accuracy or correctness of and prove by demonstration, evidence, or testimony, the location, size dimension, and condition of an item.

"Regulations": Includes laws, statutes, ordinances and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry to control performance of the Work, whether lawfully imposed by authorities having jurisdiction or not.

"Installer": An entity engaged by the Contractor, either as an employee or Sub-Contractor for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform. The term "experienced" when used with the term "Installer" means having a minimum of five years of experience on projects similar in size and scope to this project and familiar with the precautions required, and has complied with requirements of the authority having jurisdiction.

"Governing Authorities", "Authorities Having Jurisdiction", "Town", "City", "Municipality", or "Public Authority" shall include Federal, State, County or Municipal government and bureaus and subdivisions thereof, to the extent of the jurisdiction of any of them.

STANDARDS

Various standards are referenced in the Specification Standards and Design Guidelines. Reference standards shall be the current edition, as of the date of specifications for the intended project. Project design and construction shall meet all governing codes, standards and regulations.

If compliance with two or more standards is specified and the standards establish different or conflicting requirements, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

In addition to sources identified in individual sections of the Specification Standards, standards of the following organizations are referenced by initials only.

3. ANSI: American National Standards Institute.
4. ASTM: American Society for Testing and Materials.
5. IBC: International Building Code of the International Code Council, as amended by the local building authority.
6. UL: Underwriters Laboratories Inc.
7. USGBC: United States Green Building Council.
8. LEED: Leadership in Energy and Environmental Design.
9. ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers
10. NFPA: National Fire Protection Association

Measurements in these Specification Standards are shown in English inch-pound-second system.

ABBREVIATIONS

ACI	American Concrete Institute
ACRM	Asbestos Containing Roof Material
ADA	Americans with Disabilities Act
AFF	above Finished Floor
AFG	above Finished Grade
AHERA	Asbestos Hazard Emergency Response Act of 1987
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
APA	American Plywood Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
AVM	Audio/Visual Main
AVM	Audio Visual
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers Association
AWS	American Welding Society
BICSI	Building Industry Consulting Services, International (BICSI: A Telecommunications Association)
BOCA	Building Officials and Code Administrators International
CAT425	Erico Caddy CableCat
CATV	Community Antenna Television
CC	Cabling Contractor
CD - ROM	Compact Disc - Read Only Memory
CFC	Chlorofluorocarbon
CISCA	Ceilings and Interior Systems Construction Association
CMU	Concrete Masonry Unit
CRA	California Redwood Association
DHI	Door & Hardware Institute
EC	Electrical Contractor
EFIS	Exterior Finish Insulation System
EMT	Electrical Metallic Tubing

EPA	Environmental Protection Agency
EWP	Extended Warranty Program
GFCI	Ground Fault Circuit Interrupter
HVAC	Heating, Ventilation and Air Conditioning
IAFF	International Association of Fire Fighters
IBC	International Building Code
ICBO	International Conference of Building Officials
IMC	International Mechanical Code
LEED	Leadership for Environmental and Energy Design
MATV	Master Antenna Television
MERV	Minimum Efficiency Reporting Value
NCAA	North Carolina Athletic Association
NCHSAA	North Carolina High School Athletic Association
NCSBC	North Carolina State Building Code
NCTA	National Cable Television Association Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFSHSA	National Federation of State High Schools Associations
NRCA	National Roofing Contractors Association
OLTS	Optical loss test set in optical fibers or infers attenuation by backscattered light measurements.
OSHA	US Occupational Safety and Health Administration
OTDR	Optical Time Domain Reflectometer
RAIL	Remote Annunciator Indicator Light
RFI	Request for Information
RRC	Registered Roof Consultant
SBCA	Sustainable Buildings and Construction Initiative (UNEP)
SBCCI	Southern Building Code Congress International
SCL	Structural Composite Lumber
SCTE	Society of Cable Telecommunications Engineers Standards
SDI	Steel Door Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc.
SPIB	Southern Forest Products Association

STC	Sound Transmission Class
TBB	Telecommunications Bonding Backbone
TC	Technology Closet and Technology Contractor
TER	Technical Equipment Room
TIA/EIA	Commercial Building Grounding and Bonding Requirements for Telecommunications
TPO	Thermoplastic Olefin or Polyolefin Membrane Roofing
UL	Underwriters Laboratories, Inc.
USGBC	United States Green Building Council
UTP	Unshielded Twisted Pair (Cat 5 network cabling)
VCT	Vinyl Composition Tile
VOC	Volatile Organic Compound
WDMA	Window & Door Manufacturers Association
WMMP	Wood Molding and Millwork Producers
WWPA	Western Wood Products Association



INSTRUCTIONS TO THE DESIGNER

The Contractor is responsible for all work in the Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections.

The following is a list of provisions and instructions gathered from previous CCS projects. The information provided is as documentation of lessons learned and as items to think about. Where possible it is important to verify this information is made clear and included in the Construction Documents for all CCS projects.

Contact the CCS Construction Department for guidance or questions.

Existing Conditions

Perform a greater number of borings for subsurface evaluations. (To determine presence of rock and groundwater.)

Perform a Topsoil Analysis.

Substructure

The Contractor shall coordinate concrete cylinders with the Owner's independent testing agency. Concrete cylinders will not be made by The Contractor.

The Contractor shall be responsible for all concrete work including all pads and bases required by the electrical, plumbing, or HVAC systems whether or not indicated by the documents.

The Contractor will be responsible for furnishing and installing all concrete reinforcement for the concrete provided under his control.

The Contractor will provide any approved concrete additives necessary to allow them to continue work in hot or cold weather.

Shell

The Contractor will be responsible for bracing walls, as work progresses, to comply with applicable codes and safety standards.

The Contractor will furnish and install all exterior expansion joint assemblies as indicated in plans or specifications.

The Contractor will furnish and install roof opening frames and miscellaneous deck support framing related to the mechanical, plumbing or electrical work whether indicated or not. The Contractor will supply and install any other mechanical, plumbing or electrical opening frames required but not indicated on the drawings. The Contractor will also furnish and install any metal framework, anchor bolts or other miscellaneous steel

required for the installation or support of plumbing, mechanical or electrical work whether indicated in the contract documents or not.

The Contractor shall furnish and install all flashing related to the roof drains and vents.

All roof specialty accessory items are part of the Contract.

The Contractor is responsible for all exterior insulation, caulking and firestopping and firestopping required to properly install the work and meet local authority requirements.

The Contractor will provide all necessary caulking at masonry, windows, and door openings whether shown on the plans or not. All metal door frames and window frames shall be caulked at non-welded metal to metal junctions.

The Contractor will provide lintels over all ducts and pipe openings in masonry walls.

The Contractor should coordinate and layout, opening locations with the subcontractors.

The Contractor will furnish and install access panels in finished work as required to provide access to concealed mechanical work, and concealed plumbing valves, equipment and drains installed under this contract. The Contractor shall also furnish and install access doors in finished work to provide access to electrical panels, junction boxes, pull boxes, etc. installed under this contract.

The Contractor is responsible for layout of openings in walls and roof as required for the work. Contractor is to ensure the roof frames are installed correct and level.

When the installation of the work affects, and/or modifies any existing roof, the Contractor will provide roof repair of the existing roof with materials compatible with the existing roofing materials. The Contractor will test the material of the roof and certify that the materials are compatible. Where penetrations are made through existing roofing, the Contractor strip existing material back a minimum of 2 feet and replace with all new material(s) required to form a waterproof system.

Interiors

The Contractor will furnish and install all interior expansion joint assemblies as indicated in plans or specifications.

The Contractor shall furnish and install all framing, blocking, and miscellaneous nailers that are built into the Work in locations such as walls, pads, etc. Loose nailers and blocking required for casework, plumbing fixtures and other items shall be furnished and installed by The Contractor whether shown on the plans or not. The Contractor may substitute wood blocking with 18 gage 6" wide galvanized metal blocking where approved by code. The Contractor will furnish and install all nailer bolts, anchor bolts, thru-bolts and other miscellaneous rough hardware and connections related to the carpentry work. The anchor bolts shall be placed a minimum 6" from the ends of all nailer boards.

Fire rated plywood for use as telephone backboards or substrate for electrical equipment will be furnished, installed and painted by The Contractor.

The Contractor is responsible for all interior insulation, caulking and firestopping and firestopping required to properly install the work and meet local authority requirements.

The final coats of paint per the contract schedule shall not be applied until the permanent lighting or an equal temporary lighting source provided by The Contractor is functioning throughout the building interior unless approved in advance by the Owner's Representative. All efflorescence shall be removed prior to painting. Electrical and mechanical work shall be coordinated to allow for this to be accomplished on schedule.

Acoustical ceiling tiles should not be installed until the building has a permanent air conditioning system operating unless approved in advance by the Owner's Representative. Mechanical and electrical work shall be coordinated to allow for this to be accomplished on schedule.

Priming and painting of all exposed electrical conduits, piping, strapping and hangers in all areas is the responsibility of The Contractor.

All floor mounted fixtures installed to ceramic tile and/or quarry tile shall be grouted in place with a mildew resistant cementitious grout.

The Contractor is to coordinate the rough-in work of all subcontractors for all items that will be embedded into concrete, masonry or drywall partition work.

The Contractor is responsible for layout of openings in walls, ceilings and floors as required for the work.

The installation of all door hardware and its correct operation (including correct keying) is a condition precedent to Substantial Completion.

Develop better door hardware standards/guidelines for rooms and exterior building exits.

Services

The Contractor will include all exterior storm drainage. The Contractor is responsible for the site piping and all connections between the end of each roof drain and condensate line and the storm drainage system whether indicated on plans or not.

Water, sanitary sewer and fire line work from the point of inception to the point of connection with the public utility supplier or existing onsite tie-in as described in the documents will be provided by The Contractor. The Contractor will make all final connections between the building water and sewer lines and the exterior water and sewer lines. Any concrete required below slab or below grade for interior or exterior water or sewer work will be the responsibility of The Contractor.

Roof drains will be furnished and installed as part of the Contract. All roof drain piping and final pipe connections to the roof drain are part of the contract.

The Contractor shall verify electrical characteristics of all electrically operated equipment matches the electrical services provided as indicated by the contract documents.

The Contractor shall coordinate all service connection requirements.

The Contractor is responsible for all plumbing work relative to Division 22 shown in the plans and specifications.

The Contractor will coordinate the location of, and layout all duct and pipe coverings in building walls, floors, and roofs. The Contractor will provide lintel concrete or steel as required to support all openings in masonry walls and all steel for roof openings called for on the structural drawings. Sheet metal sleeves or forms for penetrations through the concrete will be by The Contractor. All pipe sleeves through walls will be by The Contractor.

Testing and Balancing Services for mechanical systems will be accomplished by a Testing and Balancing firm directly employed by the Mechanical contractor but approved by the Engineer and Owner.

The Contractor, as part of the security system installation, will be responsible for providing and programming the new security system devices to communicate with the existing security system. All permitting associated with this work is the responsibility of The Contractor. The Contractor will have the additional devices fully operational, programmed and monitored prior to final inspection by the local building authority.

The Contractor shall review the complete set of plans and install receptacles and switches so as not to interfere with elevations, shelves, cabinets, casework, chalkboards or other furnishings.

The Contractor will mark all underground non-metallic conduit and piping with metallic tracing tape directly adhered to the conduit or piping.

The Contractor will provide, drill and install all sleeves necessary for the Telecommunications Contractor. Sleeves will be installed based on location information provided by the Telecommunications Contractor.

The Contractor will be responsible for fire caulking all work installed by the Telecommunications Contractor.

Blank cover plates for all unused Data- and Telecommunications outlets will be provided by The Contractor.

The Contractor's electrical subcontractor will be responsible for grounding the bus bars in each data room.

The Contractor's electrical subcontractor will furnish, install and ground all pathways for voice, video, data, for the Telecommunications contractor. No cable will run exposed. If cable is to run in areas without accessible ceilings the electrical contractor will provide a conduit pathway to the nearest data room or accessible ceiling.

Equipment and Furnishings

Incorporate library shelving as part of the construction documents not as part of F&E.

Choose a standard stage curtain arrangement (stationary legs vs. cyclorama).

Develop Food Service Equipment standards.

Special Construction and Demolition

The Contractor is responsible for any and all site or building demolition work shown on the plans or described in the specification including, but not necessarily limited to, removal and disposal of existing buildings, concrete walks, curbs, paving, storm drainage, sewer lines, fencing, etc. Saw cutting associated with asphalt, concrete, and masonry removal will be done by The Contractor. Coordination of any required disconnection of all utilities is also the responsibility of The Contractor.

Building Sitework

The Contractor shall maintain in an accessible condition an area forty (40) feet wide from the outside face of the building and completely around the new construction. This area is to be maintained so as to provide access to the building by all trades.

The Contractor is responsible for all temporary and permanent grassing as indicated including the area around the building perimeter and the disturbed areas of the site. The Contractor shall finish grade over the entire site areas and seed per the specifications as soon as exterior work is done. Contractor is responsible for watering, weeding, fertilizing, amending, and mowing of all playing and practice fields weekly until 90-days after the substantial completion of the work. The Contractor is responsible for watering and mowing until a stand of grass as defined by the specifications is established. The Contractor is responsible for watering and mowing on all playing fields weekly as directed until a stand of grass as defined by the specifications is established. The Contractor is also responsible for mowing and trimming the grass within the construction area, either bi-weekly or as directed by the Owner.

The Contractor shall take precautions to adequately protect all metal surfaces prior to installation of masonry around these surfaces.

Sod all of the athletic fields.

Include irrigation system at all fields.

Standardize Outdoor Bleacher Requirements at the different grade level schools.

Create standards for athletic fields. (i.e. fence distances, dugout requirements, etc.).

General

The Contractor must use gas or diesel powered welding machines. The use of electric welders will not be permitted.

The Contractor is responsible for the labeling of all firewalls, piping, and ductwork above and below the ceiling as required by local, state and/or federal codes.



01 22 00 – UNIT PRICES

Include the following Unit Prices:

- A. Provide price per cubic yard for open rock excavation.
 - 1. Unit price includes all tasks related to the removal, disposal off-site, and replacement of mass rock with a controlled backfill material from an off-site source.

- B. Provide price per cubic yard for trench rock excavation and removal from site.
 - 1. Unit price includes all tasks related to the removal, disposal off-site, and replacement of trench rock with a controlled backfill material from an off-site source.

- C. Provide price per cubic yard to replace unsuitable soil with onsite material.
 - 1. Unit price includes all tasks related to the removal, disposal off-site and replacement of unsuitable soil and debris with a controlled backfill material from an on-site source.

- D. Provide price per cubic yard to replace unsuitable soil with offsite material.
 - 1. Unit price includes all tasks related to the removal, disposal off-site, and replacement of unsuitable soil and or debris with a controlled backfill material from an off-site source.

- E. Provide price per cubic yard to strip and stockpile topsoil.
 - 1. Unit price includes all tasks related to the removal and stockpiling of topsoil in designated area.

- F. Provide price per cubic yard to respread topsoil.
 - 1. Unit price includes all tasks related to respreading of topsoil retrieved from designated area.

- G. Provide price per cubic yard for stone backfill.
 - 1. Measurement shall be cross section of excavation. Unit price shall include purchase, transportation, placement and compaction.

END OF SECTION 01 22 00



Construction Phase of Projects

- Permit costs
 - State review and permit fees
 - NCDENR
 - NCDOI
 - NCDOT
 - NCDPI
 - County
 - Hydrant test
 - Building permit
 - Usage/Impact use fee
 - Technology fee
 - Construction trailer fee
 - Plan review fee
 - Water meter
 - Plumbing subcontractor permit
 - Mechanical subcontractor permit
 - Electrical subcontractor permit
 - City
 - Planning & zoning review fee
 - Water meter permit application fee
 - Sewer permit application fee
 - Public water application fee
 - Usage/Impact use fee
 - Water connection fee
 - Sewer connection fee
 - Driveway permit
 - Fire plan review fee
 - Development service plan review fee
 - Construction trailer temporary permit
 - Grading permit
 - Flood study review
 - Zoning permit
 - Privilege license
 - Temporary use permit
 - Certificate of compliance fee
 - Temporary power
 - New construction permit
 - Zoning clearance/fire
 - TIA review
 - Sprinkler permit fee

- Required easements
 - Detention pond(s) maintenance easement(s)
 - Off site utility easements
 - On site utility easements
 - R.O.W. and road improvement permanent and construction easements
 - Traffic signal easements

- Utilities
 - Water for fire protection and normal occupant use
 - Sewer
 - Storm water
 - Electrical
 - Gas
 - Cable Television/Internet/Data Communications
 - Telephone
 - Related issues
 - Proximity to the site
 - Availability and service capacity
 - Potential for service from two directions or a loop service



01 77 00 - SCHEDULE OF WARRANTIES

All work shall be fully warranted for a minimum of one year from the date of substantial completion by the contractor who shall replace any defective materials and repair any defective workmanship. In addition, written warranties shall be provided for the following products and time periods. These warranties shall include any material and labor cost to repair defective materials and correct defective workmanship and subsequent damage.

GENERAL CONTRACTOR - WARRANTY DOCUMENTATION

Contractor's General Warranty - 1 year, 2 years

Asbestos Free Warranty

07 00 00 Roof Insulation Thermal Warranty - U value will not vary more than 10% over 15 years

07 00 00 Built-up Roofing System - 3 years

07 31 13 Built-Up Asphalt Roofing Contractor - Materials/Workmanship/Leaks - 2 years,
Mfr. - Materials/Workmanship - Leaks 10 years

07 50 00 Membrane Roofs - Water Tight Warranty - 20 years

07 56 00 Fluid Applied Roof - Water Tight Warranty - 20 years

07 61 00 Sheet Metal Roofing - complete system installation
Mfr. - Finish & Weathertight Warranty - 20 years
Mfr. - All penetration flashings, eaves, ridge, hips, and valleys - 20 years

08 10 00 Doors
Mfr. - All Doors and Frames - from the date of installation - 10 years

Flush Wood Doors - 10 years

Solid-core interior doors
Mfr. - Materials/Workmanship Life of installation

08 41 00 Aluminum-Framed Entrances and Storefronts
Mfr. - Entire System - 10 years

08 51 13 Aluminum Windows
Mfr. - Materials/workmanship - Repair & Replace - 2 years
Mfr. - Metal Finishes - Repair & Replace - 0 years

08 71 00 - Door Hardware
Mfr. - Materials/Workmanship on all finish hardware - 1 year against defects, commencing with substantial completion
except*
*Mfr. - Door Position Switches in concealed closers - 2 years
Mfr. - Manual Closers - 10 years

All closers shall have been tested by independent testing laboratory for 10,000,000 cycles.
Mfr. - Exit Devices - 10 years

08 80 00 Glazing

Mfr. - Coated Glass - units only - 10 years
Mfr. - Insulating Glass - units only - 10 years

09 64 00 Wood Athletic Flooring

Mfr. - Defects and MFMA grading certification - 5 years

09 65 66 Resilient Athletic Flooring

Mfr. – Wear - 15 years
Contractor/Installer - Materials/Workmanship/Performance - 2 years

09 68 00 Carpet

Mfr. - Defects in Materials and Workmanship - 5 years
Mfr. - Limited Wear (non-prorated to cover excessive surface wear, edge ravel, zippering, backing de-lamination, watermarking on any product not 100% loop construction, and excessive static electricity.) – 20 years

09 68 13 Carpet Tile

Mfr. - Wear, edge ravel, tuft bind and de-lamination - Lifetime of carpet
General Contractor/Installer - warranty against defects on installation - labor and materials - 3 years

10 11 00 Visual Display Boards

Dry Erase Boards and Tack Boards - 50 years
Wear - fading of color, crazing, cracking or flaking - Lifetime Guarantee

10 22 26 Operable Partitions

Entire System: Track, trolley, panels, seals, hardware (except finishes) - 2 years
Mfr. - No-dollar-limit material warranty to cover all direct and indirect costs except labor.
Vendor: Installation and Labor - 2 years

11 31 00 Residential Appliances (Electric Range, Refrigerator, Clothes Washer, Clothes Dryer)

Mfr.'s Special written warranties

Mfr. - Materials/Workmanship - 1 year

Electric Range - Limited warranty for in-home service on surface-burner elements - 5 years

Refrigerator - Limited warranty on the sealed refrigeration system - 5 years

Clothes Washer - Limited warranty for in-home service on the inner wash basket and outer tub - 10 years

Clothes Washer - Limited warranty for in-home service on the balance suspension system and drive transmission - 5 years

Clothes Dryer - Limited warranty for in-home service on the inner wash basket and outer tub - 10 years

Clothes Dryer - Limited warranty for in-home service on the balance suspension system and drive transmission. - 5 years

11 31 00 Athletic Washer/Extractor and Athletic Dryer

Mfr. - Frame, back gable and wash cylinder - 5 years
Mfr. - Main drive motor and all other washer parts – 5 years
Mfr. - All dryer parts - 2 years

11 40 00 Food Service

Mfr. - Materials/Workmanship- New equipment - 1 year
Mfr. - Refrigeration Compressors - 5 years

12 30 00 Laminate Clad Casework

Mfr. - Materials/Workmanship from date of acceptance. - 3 years
Mfr. - Replace and repair defects in material or fabrication - 3 years without charge

12 35 53 Wood Laboratory Casework & Equipment

Mfr. - Materials/Workmanship (from date of Substantial Completion) - 1 year

21 10 00 - Fire Alarm & Smoke Detection Systems

Contractor - Materials/Installation - 2 years
Mfr. - Control System & Field Devices - 2 years

22 05 00 Domestic Water Storage Tank

No Limit Parts and Labor - 20 years

22 13 16 Sewerage Pumps & Systems

Mfr. - Rail System - 5 years
Explosion Proof Submersible Grinder Pumps Mfr. - Replace Unit/Parts - FOB factory - 1 year

23 00 00 Boilers

Mfr. - Pressure Vessel - Non-prorated
Mfr. - Heat exchanger/combustion chamber –Prorated 5 years

23 00 00 Refrigerator Condensers

Materials - 5 years
Mfr. - Variable Frequency Fan Motor Drive - 3 years
All Compressors - 5 years
All Refrigerator Compressors - 5 years

23 00 00 Air Cooled Water Chillers

Mfr. - Parts - 1 year
Mfr. - Replacement Compressors - 5 years
Mfr. - Refrigerant - 2 years
Mfr. /Contractor - Full service & maintenance - 1 year

25 00 00 Controls & Instrumentation

All materials/labor/equipment - 1 year

26 00 00 Transient Voltage Surge Suppressors (TVSS)

5 years

27 08 00 Technology System

25 years

27 51 13 Paging System

Technology Contractor - Warranty of the installed system against defects in material and workmanship. All warranty material and labor will be provided at no expense. Additionally, when requested within 1 year of date of substantial completion, provide on-site assistance in adjusting to suit actual occupied conditions. Provide up to 2 visits to the site for this purpose without additional cost to the Owner. - 2 years

28 23 00 Security Systems

1 year

Contr. & Supplier - Parts/Labor/Travel - 1 year

31 31 16 Termite Control

Contractor - Retreat soil; repair & replace damage - 5 years

32 10 00 Running Track Surface

Mfr. /Contr. - Materials/Workmanship - 5 years *

First 2 years backed by a TWO-YEAR MAINTENANCE BOND issued by a treasury-listed surety - 2 years

32 92 19 Lawns and Grasses

Water, Fertilize, Mow, Weed, Trim - 1 year

32 93 00 Trees and Shrubs

Contractor - Replace if 25% or more of a tree or shrub is dead - 1 year

END OF 01 77 00



01 78 43 - SPARE PARTS

08 71 00, "Hardware" - 5 change Keys/Lock, 6 Master Keys

12 61 00, "Fixed Audience Seating" - 5% of each seat type

23 50 00, "Heating, Ventilating and Air Conditioning" - All Belt-Driven equipment shall be provided with a new belt at final completion and a new spare belt to be turned over to the Maintenance Department.

23 82 19, "Air Handling Units and Fan Coil" - Mechanical contractor shall be responsible for a complete change of filters at final completion, and for leaving a set of Merv 8 pleated filters and set of belts.

27 50 00, "Fire Alarm Systems"

1. With the system, each spare part shall be provided, individually packaged and labeled, and turned over to the Owner:
 - a. Fuses - 2% of each size
 - b. Pull Stations - 2% of total connected to the FACP
 - c. Indoor Horns & Strobes - 4% of total connected to the FACP
 - d. Spot Type Detector Heads and Bases - 4% of total connected to the FACP
 - e. Duct Smoke Detector Heads - 4% of total connected to the FACP
 - f. Monitor and Control Modules - 2% of total connected to the FACP

END OF 01 78 43



01 78 46 - EXTRA STOCK MATERIALS

EXTRA STOCK TO OWNER AT PROJECT COMPLETION

07 31 13, "Asphalt Shingles" – 5 % of all colors

09 30 00, "Tile" (this includes ceramic tile, quarry tile and VCT) -5 % of all tile installed

09 51 13, "Acoustical Panel Ceilings" – 2 % of acoustical units supplied

09 65 00, "Resilient Flooring" (Rubber or Vinyl Tile) – 5 % extra stock of each color used

09 68 00, "Carpet" -Provide 5 % extra stock of all carpet installed on the project.

09 90 00, "Paint" - For touch ups, 5 gallons of each color

END OF 01 78 46



01 81 13 – SUSTAINABLE DESIGN GUIDELINES

GENERAL

Throughout this document are the building systems and materials that CCS desires to be utilized in the design/construction of all new and renovated facilities. CCS goal for all new construction is to achieve a 50% energy savings toward a net zero energy building. The minimum reduction that CCS will accept is a 30% energy savings toward a net zero energy building, as defined in *The Advanced Energy Design Guide for K-12 School Buildings, Achieving 30% Energy Savings Toward a Net Zero Energy Building*, published in 2008 by The American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc., in association with the American Institute of Designers; the Illuminating Engineering Society of North America; the U.S. Green Building Council; and The U.S. Department of Energy. As of the date of this publication a free copy may be downloaded at www.ashrae.org/publications/page/1604. CCS is in Zone 3 of this document, and specific attention is drawn to pages 40 and 41.

Here is a brief description of how to use the ASHRAE document:

1. Review Chapter 2 to understand how an integrated design approach is used to achieve 30% or greater energy savings. Checklists show how to establish and maintain the energy savings target throughout the project.
2. Use Chapter 3 to select specific energy saving measures by climate zone. This chapter provides a prescriptive path that does not require modeling for energy savings. These measures also can be used to earn credits for CHPS, LEED®, and other building rating systems.
3. Review the case studies in Chapter 4 to see how the 30% energy savings goal has been met in schools in climate zones across the country.
4. Use Chapter 5 to apply the energy savings measures in Chapter 3. This chapter has suggestions about best design practices, how to avoid problems, and how to achieve additional savings with energy-efficient appliances, plug-in equipment, and other energy saving measures.

Consider Energy Implications in Site Selection and Building Orientation:

1. Orient buildings to be able to integrate passive and active solar strategies. If renovating/retrofitting an existing structure (i.e. when employing passive solar strategies is not possible), consider planting trees to shade areas of the building that get more sunshine. Coordinate sustainable site design with site security considerations, including Crime Prevention Through Environmental Design (CPTED) strategies.
2. Take advantage of natural ventilation and prevailing wind patterns.
3. Maximize daylight use.
4. Investigate the potential impact of future adjacent developments to the site (e.g., solar and wind exposure, daylighting, ventilation, etc.).

Minimize the environmental impacts of construction and operation, during the construction phase of this project. The Contractor shall implement the following procedures singly or in combination:

1. Select Energy Star qualified products that minimize consumption of non-renewable resources, consume reduced amounts of energy and minimize pollution. Use recycled and recyclable materials.
2. Control sources for potential Indoor Air Quality (IAQ) pollutants by controlled selection of materials and processes used in project construction.

For additional energy efficient measures and renewable energy requirements refer to ANSI/ASHRAE/USGBC/IES Standard 189.1, *Standard for the Design of High Performance, Green Buildings Except Low Rise Residential Buildings*. Also refer to Standard 189.1 for requirements that can be expanded incorporating site sustainability, water use efficiency, indoor environmental air quality and the building's impact on the atmosphere, materials and resources.

DEFINITIONS

Agrifiber Products: Composite panel products derived from agricultural fiber

Biobased Product: As defined in the 2002 Farm Bill, a product determined by the Secretary to be a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials

Biobased Content: The weight of the biobased material divided by the total weight of the product and expressed as a percentage by weight

Certificates of Chain-of-Custody: Certificates signed by manufacturers certifying that wood used to make products has been tracked through its extraction and fabrication to ensure that it was obtained from forests certified by a specified certification program

Composite Wood: A product consisting of wood fiber or other plant particles bonded together by a resin or binder

Construction and Demolition Waste: Includes solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair and demolition operations. A construction waste management plan is to be provided by the Contractor.

LEED: The Leadership in Energy & Environmental Design green building rating systems developed and adopted by the U.S. Green Building Council (USGBC). The systems certify levels of environmental achievement based on a point and credit scoring system.

Light Pollution: Light that extends beyond its source such that the additional light is wasted in an unwanted area or in an area where it inhibits view of the night sky

Recycled Content Materials: Products that contain pre-consumer or post-consumer materials as all or part of their feedstock

Post-Consumer Recycled Content: The percentage by weight of constituent materials that have been recovered or otherwise diverted from the solid-waste stream after consumer use.

Pre-Consumer Recycled Content: Materials that have been recovered or otherwise diverted from the solid-waste stream during the manufacturing process. Pre-consumer content must be material that would not have otherwise entered the waste stream as per Section 5 of the FTC Act, Part 260 “Guidelines for the Use of Environmental Marketing Claims”: www.ftc.gov/bcp/gmrule/guides980427

Regional Materials: Materials that are extracted, harvested, recovered, and manufactured within a radius of 250 miles (400 km) from the Project site.

Salvaged or Reused Materials: Materials extracted from existing buildings in order to be reused in other buildings without being manufactured.

Sealant: Any material that fills and seals gaps between other materials.

Volatile Organic Compounds (VOCs): Any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. Compounds that have negligible photochemical reactivity, listed in EPA 40 CFR 51.100(s), are also excluded from this regulatory definition.

PRODUCTS

- A. Site Clearing: Topsoil shall be provided by the Contractor from on-site material which has been stockpiled for reuse. Off-site borrow should only be used when on-site sources are exhausted.
- B. Do not burn rubbish, organic matter, etc. or any material on the site. Dispose of legally.
- C. Herbicides and Pest Control: Herbicides shall not be permitted, and pest control measures shall utilize EPA-registered biopesticides only.
- D. Water-Conserving Fixtures: Plumbing fixtures and fittings shall use in aggregate at least 40% less water than the water use baseline calculated for the building after meeting the Energy Policy Act of 1992 fixture performance requirements. Flow and flush rates shall not exceed the following:
 - 1. Toilets: no more than 1.3 gallons per flush, otherwise be dual flush 1.6/0.8 gallons per flush, and have documented bowl evacuation capability per MaP testing of at least 400 grams
 - 2. Urinals: no more than 0.125 gallons per flush or use
 - 3. Lavatory Faucets: 0.5 gpm with automatic faucet controls
 - 4. Kitchen Sink Lavatories: 2.2 gpm
- E. Elimination of CFCs AND HCFCs:
 - 1. Ozone Protection: Base building cooling equipment shall contain no refrigerants other than the following: HCFC-123, HFC-134a, HFC-245fa, HFC-407c, or HFC 410a.
 - 2. Fire suppression systems may not contain ozone-depleting substances.
 - 3. Extruded polystyrene insulation (XPS) and closed-cell spray foam polyurethane insulation shall not be manufactured with hydro chlorofluorocarbon (HCFC) blowing agents.

- F. Appliances and Equipment: All Energy Star eligible equipment and appliances, including office equipment, computers and printers, electronics, and commercial food service equipment (excluding HVAC and lighting components), shall be qualified by EPA's Energy Star program.
- G. Adhesives and Sealants:
1. All adhesives and sealants, regardless of where they are used, must comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24):
 - a. Concrete Curing Compound: 60 g/L
 - b. Concrete Sealer: 10 g/L
 - c. Concrete Form Release Agents: 0g/L
 - d. Garage Deck Sealer: 50g/L
 - e. Wood Glues: 20 g/L
 - f. Millwork and Casework Adhesives: 20g/L
 - g. Metal to Metal Adhesives: 30 g/L
 - h. Adhesives for Porous Materials (Except Wood): 50 g/L
 - i. Subfloor Adhesives: 50 g/L
 - j. Plastic Foam Adhesives: 50 g/L
 - k. Carpet Adhesives: 50 g/L
 - l. Carpet Pad Adhesives: 50 g/L
 - m. Carpet Seam Sealer: 50g/L
 - n. VCT and Sheet Vinyl Adhesives: 50 g/L
 - o. Cove Base Adhesives: 50 g/L
 - p. Rubber Floor Adhesives: 60 g/L
 - q. Wood Flooring Adhesives: 100 g/L
 - r. Ceramic Tile Adhesives: 65 g/L
 - s. Gypsum Board and Panel Adhesives: 50 g/L
 - t. Gypsum Drywall Joint Compound: 20 g/L
 - u. Portland Cement Plaster: 20 g/L
 - v. Multipurpose Construction Adhesives: 70 g/L
 - w. Cast Resin Countertop Silicone Sealant: 20g/L
 - x. Plastic Laminate Adhesives: 20 g/L
 - y. General Contact Adhesive: 80 g/L
 - z. Structural Glazing Adhesives and Compounds: 100 g/L
 - aa. Silicone Sealant: 50 g/L
 - bb. Pipe Thread Sealant: 50 g/L
 - cc. Duct Sealant: 10 g/L
 - dd. Plastic Cement Welding Compounds: 250 g/L
 - ee. ABS Welding Compounds: 400 g/L
 - ff. CPVC Welding Compounds: 270 g/L
 - gg. PVC Welding Compounds: 150 g/L
 - hh. Adhesive Primer for Plastic: 250 g/L
 - ii. Architectural Sealants: 250 g/L
 - jj. Single-Ply Roofing Membrane Adhesives: 250 g/L
 2. Interior sealants shall not contain: mercury, butyl rubber, neoprene, SBR (styrene butadiene rubber), or nitrile.
 3. Sealants and glazing compounds formulated with aromatic solvents (organic solvent with a benzene ring in its molecular structure) fibrous talc or asbestos, formaldehyde, halo-genated solvents, mercury, lead, cadmium, hexavalent chromium, or their components shall not be used.

4. Adhesives used to apply laminates, whether shop-applied or field-applied, shall contain no urea-formaldehyde.
- H. Paints and Coatings:
1. Interior Paints and Coatings: For interior field-applied applications, use paints and coatings that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24) and the chemical restrictions (Restricted Components listed below) of Green Seal Standard GS-11, Paints, First Edition, May 20, 1993; Green Seal Standard GC-03, Anti-Corrosive Paints, Second Edition, January 7, 1997; and South Coast Air Quality Management District Rule 1113, Architectural Coatings, rules in effect on January 1, 2004, as follows:
 - a. Flat Paints and Coatings: Not more than 10 grams of VOC per liter of coating less water and exempt compounds, including pigments
 - b. Non-Flat Paints and Coatings Except High Gloss: Not more than 50 grams of VOC per liter of coating less water and exempt compounds, including pigments.
 - c. High Gloss Paints and Coatings: Not more than 150 grams of VOC per liter of coating less water and exempt compounds, including pigments. High Gloss Coatings are coatings that register a gloss of 70 or above on a 60-degree meter according to ASTM Test Method D 523 as specified in paragraph (e)(6).
 - d. Water-Based Polychromatic Finish Coatings: Not more than 150 g/L (150 g/L for primer and flat polychromatic paint)
 - e. Anti-Corrosive Coatings: Not more than 100 grams of VOC per liter of coating less water and exempt compounds
 - f. Sanding Sealers: Not more than 50 grams of VOC per liter of coating less water and exempt compounds
 - g. Waterproofing Sealers: Not more than 100 grams of VOC per liter of coating less water and exempt compounds
 - h. Concrete Slab Sealers: Not more than 10 grams of VOC per liter of coating less water and exempt compounds
 - i. Polyurethanes: Not more than 100 grams of VOC per liter of coating less water and exempt compounds
 - j. Stains: Not more than 250 grams of VOC per liter of coating less water and exempt compounds
 2. Interior field applied varnishes and lacquers are not permitted.
 3. Interior paints shall not contain antimicrobial additives (such as fungicides and biocides).
 4. Exterior Paints and Coatings: For exterior applications, use paints and coatings that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24) and the chemical restrictions (Restricted Components listed below) of Green Seal's Standard GS-11:
 - a. Flat Paints and Coatings: Not more than 50 grams of VOC per liter of coating less water and exempt compounds, including pigments
 - b. Non-Flat Paints and Coatings: Not more than 150 grams of VOC per liter of coating less water and exempt compounds, including pigments
 - c. High Gloss Paints and Coatings: Not more than 150 grams of VOC per liter of coating less water and exempt compounds, including

- pigments. High Gloss Coatings are coatings that register a gloss of 70 or above on a 60-degree meter according to ASTM Test Method D 523 as specified in paragraph (e)(6)
- d. Anti-Corrosive Coatings: Not more than 100 grams of VOC per liter of coating less water and exempt compounds
 - e. Varnishes and Sanding Sealers: Not more than 275 grams of VOC per liter of coating less water and exempt compounds
 - f. Stains: Not more than 250 grams of VOC per liter of coating less water and exempt compounds
5. Aromatic Compounds: Paints and coatings shall not contain more than 1% (by weight) total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 6. Restricted Components: Paints and coatings shall not contain any of the following:
 - a. Acrolein
 - b. Acrylonitrile
 - c. Aniline dyes
 - d. Antimony
 - e. Benzene
 - f. Butyl benzyl phthalate
 - g. Cadmium
 - h. Di (2-ethylhexyl) phthalate
 - i. Di-n-butyl phthalate
 - j. Di-n-octyl phthalate
 - k. 1,2-dichlorobenzene
 - l. Diethyl phthalate
 - m. Dimethyl phthalate
 - n. Ethylbenzene
 - o. Formaldehyde
 - p. Hexavalent chromium
 - q. Isophorone
 - r. Lead
 - s. Mercury
 - t. Methyl ethyl ketone
 - u. Methyl isobutyl ketone
 - v. Methylene chloride
 - w. Naphthalene
 - x. Toluene (methylbenzene)
 - y. 1,1,1-trichloroethane
 - z. Vinyl chloride
 - aa. Xylene
- I. Floorcoverings:
 1. All carpet systems, including adhesives, must meet or exceed the Carpet and Rug Institute Green Label Plus Indoor Air Quality Test Program.
 2. Carpet cushion shall not contain brominated flame retardants.
 3. All resilient floorcovering must be certified under the Greenguard or FloorScore indoor emissions testing programs.
 - J. Composite Wood and Agrifiber Binders: All composite wood, agrifiber products, and wood doors shall contain no added urea-formaldehyde resins.

- K. Systems Furniture and Seating:
 - 1. Systems furniture and seating made with coatings or sealants that contain any of the following solvents are not permitted: naphtha, benzene, toluene, xylene, hexavalent chromium.

- L. Fiberglass Insulation: Fiberglass batt insulation shall contain no formaldehyde-based binders or shall be third-party certified for conformance with Greenguard Children & Schools or Indoor Advantage Gold.

EXECUTION

Cabarrus County Schools is actively seeking to make its buildings high performance. This is in order to support the school system's educational mission by:

- 1. Reducing Operating Costs
- 2. Improving Academic Performance
- 3. Protecting the Environment
- 4. Build buildings which teach Sustainability
- 5. Designing for Health, Safety and Comfort
- 6. Supporting Community Values

It is expected that the design team will take an integrated approach to high performance, thereby, able to make sensible, high performance decisions. Each project is expected to have a customized plan, developed in conjunction with the complete design team and the owner's representatives.

END OF SECTION 01 81 13



01 91 13 - GENERAL COMMISSIONING REQUIREMENTS

GENERAL

Building systems commissioning shall be provided for all new schools, major addition/renovation projects with a construction budget of \$1 million or greater and for all mechanical system replacement projects.

See Division 01 Section "HVAC Commissioning Requirements" for specific requirements for commissioning HVAC systems.

DEFINITIONS

- A. BoD: Basis of Design.
- B. CxA: Commissioning Authority.
- C. OPR: Owner's Project Requirements.
- D. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.
- E. TAB: Testing, Adjusting, and Balancing.

COMMISSIONING TEAM

- A. Appointed by Owner:
 - 1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract.
 - 2. Representatives of the facility user and operation and maintenance personnel.
 - 3. Architect and engineering design professionals.

COMMISSIONING DOCUMENTATION

- A. OPR: A written document, prepared by Owner, that details the functional requirements of Project and expectations of how it will be used and operated. This document includes Project and design goals, measurable performance criteria, budgets, schedules, success criteria, and supporting information.

- B. BoD Document: A document, prepared by Architect, that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- C. Commissioning Plan: A document, prepared by CxA, that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process.
- D. Test Checklists: CxA shall develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested.
- E. Certificate of Readiness: Certificate of Readiness shall be signed by Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing.
- F. Test and Inspection Reports: CxA shall record test data, observations, and measurements on test checklists.
- G. Corrective Action Documents: CxA shall document corrective action taken for systems and equipment that fail tests.
- H. Issues Log: CxA shall prepare and maintain an issues log that describes design, installation, and performance issues that are at variance with the OPR, BoD, and Contract Documents.
- I. Commissioning Report: CxA shall document results of the commissioning process including unresolved issues and performance of systems, subsystems, and equipment.
- J. Systems Manual: CxA shall gather required information and compile systems manual.

OPERATION AND MAINTENANCE TRAINING REQUIREMENTS

- A. Training Preparation Conference: Before operation and maintenance training, CxA shall convene a training preparation conference to include Owner's operation and maintenance personnel, Contractor, and subcontractors.
- B. Training Modules: Develop an instruction program that includes individual training modules for each system, subsystem, and equipment.

END OF SECTION 01 91 13



SPECIFICATION STANDARDS

02 05 00 - OWNER'S RIGHT TO SALVAGE

EXECUTION

EQUIPMENT REMOVAL

The Designer shall inform the contractor to schedule time for Owner to remove material and equipment to be saved, prior to demolition by contractor. The Designer shall identify these items on the contract documents.

END OF 02 05 00



SPECIFICATION STANDARDS

02 80 00 – FACILITY REMEDIATION

GENERAL

- A. No building materials containing asbestos or lead-based paints shall be used in the construction of the project. The design consultant shall be required to submit a signed statement that “no asbestos containing building material or lead based paint was specified as a building material in any construction document for the project, or to the best of the consultant’s knowledge, was used in the building.”
- B. It is the intention of CCS to remove all asbestos and lead-based paints prior to the start of construction. There will be certain instances when this is not possible and this will be brought to the designer’s attention at the time of contract negotiation.
- C. If any materials suspected to contain asbestos or lead are encountered in demolition or renovation work, the Owner’s “AHERA DESIGNEE” shall be immediately contacted to arrange an investigation and testing of these materials. An Agent of the Owner shall supervise the removal of any asbestos containing material by an independent contractor hired and paid for by the Owner. A statement to this effect shall be included in the General Requirements of the project specifications.

END OF SECTION



EASEMENT ACQUISITION PROCESS

Cabarrus County Schools have in most school construction projects been required to acquire easements for a variety of reasons in order to complete the projects. In many cases the establishment of these easements have occur well into the projects and have been problematic as related to project completion and in the obtaining final certificates of occupancy.

In the best case scenario identification of needed easements should be a part of due diligence conducted at the time of researching sites to purchase for new schools. Identification of easements by CCS staff or the architects and engineers working on the project is extremely important. At this time the process should be completely transparent. All easements that will be needed for off-site utilities, possible road widening, traffic signals, or turning lanes, and temporary construction easements should be included in the final site analysis.

Once a site selection is made, the CCS Construction Services Department should take the lead in making contact with all potentially impacted property owners. These efforts should begin with face to face introductions, a discussion of the school project, and the reasons why easements on their property are needed. These early conversations are aimed at developing an open working relationship with neighboring property owners and to give them an opportunity to voice their concerns and/or support for what is being asked of them.

The discussions with neighbors may not end with the desired results and if that happens, then it is possible that the County will have to condemn the land through legal means. However, this should be considered the absolute last choice and all efforts to reconcile issues with property owners for easements should be expended before this option is considered.

The following list of easements are those commonly found in most school projects and always be considered as potentially needed unless it is determined that one or more of these easements are not needed by the authorities having jurisdiction:

- Street or road widening
- Traffic signal equipment easements
- Widening for turning lanes of traffic
- Off-site utility easements for water or sewer service
- Temporary easements for construction for any of the above permanent easements

In addition to the easements required for work off-site, there are also numerous easements that typically are needed on the school property that must be provided by CCS to the City or County. These may include some or all of the following:

- Detention pond access road and maintenance easement
- Electrical service easement
- Water service easement
- Gas service easement

- Telephone service easement
- Cable television service easement
- Public sanitary sewer service easement

Whenever easements are needed time must be allowed for a variety of tasks. These include development of a land survey and legal description, attorney's time to write the easement, the negotiation process, and time for the easements to be presented to the CCS Board of Education. In certain cases, especially where the school district must compensate a property owner for an easement, the County Commissioners must also approve the process. This takes a substantial amount of time and provision in the project schedule should be made for this work and approval process to take place.

Cabarrus County Schools School Site Selection Process

Determining the Need

The development of the school site selection process begins with the Assistant Superintendent for Administration and the Director of Transportation analyzing data relative to the core capacity of existing schools in comparison to the projected student population. This first analysis determines the year(s) in which new schools are needed.

This data is then further analyzed to determine the area of the county with the highest growth rates and schools where enrollments are projected to be above capacity. Once the Assistant Superintendent and the Director of Transportation determine there is a need for an additional school in a specific area, that need is listed in the “Fifteen Year Plan” and the actual process for site selection begins.

Site Specifications

At this time, we request the Cabarrus County Planning Department to provide us with maps of potential sites for the appropriate school (grade level) within the high growth area.

Cabarrus County Commissioners and the Board of Education several years ago established recommended acreages for each grade level as follows: Elementary Schools – 30 acres, Middle Schools – 50 acres and High Schools – 70 acres. This acreage takes into consideration additional needs of both the Parks & Recreation Department and the community groups where the schools are located. These are guidelines only and individual site acreages may vary for a variety of reasons. The main consideration must be NCDPI recommended minimum standards, size & shape of site, access and egress and other traffic concerns raised by NCDOT.

After an initial review of the sites, a team made up of the Assistant Superintendent, Transportation Director, Director of Facilities, Assistant Director of Facilities for Construction and representatives of North Carolina Department of Transportation, Cabarrus County Planning Department, Cabarrus County Parks & Recreation Department, Fire Marshall, various utilities, and our civil engineer meet at each site to review its potential.

Cabarrus County Schools School Site Selection Process

The amount of usable land must be enough for the school building, outdoor instruction, and recreation, parking and possible future expansion. Topography and drainage must be considered as well as subsoil conditions. Evaluations by our civil engineer and a soils testing company must be made prior to purchasing the property. These evaluations must include a Phase I Environmental Study, identification of flood plains and wetlands as well as identification of any protected or endangered species.

Each site is rated numerically as to its suitability and its ability to be approved by each representative. The best site being number 1 and higher numbers thereafter.

While NCDOT, the civil engineer and various utilities will be the dominating rating factors, the entire team will work towards consensus in site selection based on individual site ratings. Other factors that may influence site selection are availability of public utilities such as water, sewer, cable television (Internet), and fire protection, noise levels in the area as well as possible dangers due to various manufacturing processes.

Representatives from all of the above groups will use the attached form in rating potential sites.

**Cabarrus County Schools
School Site Selection Process**

SITE EVALUATION CHECKLIST

Person completing this form: _____

Growth Area needed for potential school _____

Proposed new school grade level _____

Acreage required _____

List of potential sites developed in concert with Cabarrus County Planning Department.

Site 1 _____

Site 2 _____

Site 3 _____

Site 4 _____

Site 5 _____

Utilities available at each site:

	Site 1	Site 2	Site 3	Site 4	Site 5
Water	_____	_____	_____	_____	_____

Comments: _____

Sewer	_____	_____	_____	_____	_____
-------	-------	-------	-------	-------	-------

Comments: _____

Electric	_____	_____	_____	_____	_____
----------	-------	-------	-------	-------	-------

Comments: _____

Cabarrus County Schools School Site Selection Process

Natural Gas _____

Comments: _____

Telephone _____

Comments: _____

Cablevision: _____

Comments: _____

Reviewers and Comments:

County Planning has reviewed and approves of the sites in the following order:

Transportation Director has reviewed and approves of the sites in the following order:

NCDOT has reviewed and approves of the sites in the following order:

Fire protection has reviewed and approves of the sites in the following order:

Civil Engineer has reviewed and approves of the sites in the following order:

Architect has reviewed and approves of the sites in the following order:

Director of Facilities reviewed and approves of the sites in the following order:

**Cabarrus County Schools
School Site Selection Process**

Director of Facilities for Construction reviewed and approves of the sites in the following order:

Additional Comments by Reviewer: _____

Phase I Environmental Study has been completed on primary site:

Date _____

Comments _____

Soil Testing is complete:

Date _____

Comments _____

Wetlands, flood plain and other environmental issues have been reviewed:

Date _____

Comments _____

Site Selection Process

Growth Projections / Demographics determine what type of school is needed (ES, MS, HS) and where to locate it.

Site Size Requirements

CCS Guidelines

ES, 20 Acres

MS, 40 Acres

HS, 70 Acres

DPI Guidelines

ES, 18-20Acres

MS, 27-30 Acres

HS, 45-50 Acres

Determine if County has Joint Venture Needs in this area

- Park Playing Fields 15-20 Acres

Identify potential sites

Land Committee Site Tour

Mail Letters of Interest to land Owners

List Sites (See Site Evaluation Check List)

Rank Sites

- Availability of Utilities
- NCDOT Recommendations
- Site Access & Transportation Routs
- Noise Levels
- Potential Hazards – Manufacturing, Chemical Processing etc.

Land Acquisition – 3 types

1. Purchase
2. Condemnation
3. Donation

Negotiate Land Sales Contract

- 90 Day “Due Diligence Period” for land evaluation

Site Evaluation Process

- Acquisition Phase Soil Borings
- Boundry Survey
- TOPO Survey
- Phase 1 Environmental Study
- US Corps of Engineers Wetlands Study

- **Traffic Study**
- **Title search**
- **Conservation Review**

Design Phase Evaluations

- **Road Widening Survey**
 - **Identify permanent ROW limits**
 - **Identify temporary construction easement limits**
- **Utility Easement Survey**
 - **Identify permanent ROW easement**
 - **Identify temporary construction easement limits**
- **Design Phase soil borings @ building location**
- **Tree survey**

Site Acquisition / Closing

- **Site Annexation**
- **Site rezoning**

Road Widening

- **Land Acquisition / Condemnation**
- **Temporary Construction Easement Acquisition / Condemnation**
- **Construction**
- **Public dedication**

Utility Easement

- **Land Acquisition / Condemnation**
- **Temporary Construction Easement Acquisition / Condemnation**
- **Construction**
- **Record Easements**

CABARRUS COUNTY SCHOOLS
NEW ELEMENTARY SCHOOL
MODEL PROGRAM SUMMARY

1000 Student Core / 800 Student Capacity

TYPICAL CLASSROOMS		No.	SIZE	Total SF
	Pre-K	2	1250	2500
	K	5	1250	6250
	First	5	1000	5000
	Second	5	1000	5000
	Third	5	1000	5000
	Fourth	5	1000	5000
	Fifth	6	1000	6000
	Sub-Total	33		34750
SUPPORT ROOMS				
		No.	SIZE	Total SF
	Cultural Arts / Multipurpose	1	3600	3600
	Stage / wings	1	1200	1200
	Music	1	1000	1000
	Visual Arts	1	1200	1200
	Chapter I resource	1	450	450
	Self Cont Autistic /SPH	2	1200	2400
	Self Contained CC	1	850	850
	Time out	1	50	50
	Resource	2	450	900
	AG	1	650	650
	Speech	1	250	250
	Sub-Total	13		12550
MEDIA CENTER				
		No.	SIZE	Total SF
	Main Room (5SF/Std)	1	5200	5200
	Media office	1	120	120
	AV production / work room	1	500	500
	Conference / small groups	1	150	150
	Equip stor / distribution	1	175	175
	Computer lab	1	1000	1000
	Computer room control	1	300	300
	Sub-Total	7		7445
PHYSICAL EDUCATION				
		No.	SIZE	Total SF
	Gym	1	3600	3600
	Equip stor	1	175	175
	Office	1	120	120
	Sub-Total	1		3895

FOOD SERVICE		No.	SIZE	Total SF
	Dining	1	4000	4000
	Serving	1	700	700
	Food prep	1	1200	1200
	Dish wash	1	200	200
	Storage	1	450	450
	Managers office	1	100	100
	Employee toilet	1	150	150
	Loading dock / plant operations	1	800	800
	Sub-Total	8		7600
ADMINISTRATION				
	Principal	1	200	200
	Ass't Principal	1	150	150
	Reception	1	400	400
	IPC ?	1	120	120
	SIMS	1	120	120
	Finance	1	120	120
	Workroom	1	140	140
	Admin work space	1	240	240
	Conference	1	400	400
	Record Storage	1	135	135
	Instructional supply	1	160	160
	Guidance Reception	1	100	100
	Guidance Office	2	120	240
	Testing	2	120	240
	Kids-Plus Office / 2 stations	1	160	160
	Kids-Plus storage	1	300	300
	Health Room	1	150	150
	Nurse office	1	100	100
	Health Room Toilet	1	50	50
	Clothes closet	1	80	80
	Laundry	1	50	50
	Teacher Work	1	400	400
	Teacher Lounge	1	400	400
	Book Storage	1	600	600
	Sub-Total	26		5055
	Sub-Total Net Sq Ft			71295
	HallsRRMechWalls	35%		24953
	TOTAL GROSS SQ FT			96248

CABARRUS COUNTY SCHOOLS
NEW ELEMENTARY SCHOOL
MODEL PROGRAM SUMMARY
1000 Student Core / 1000 Student Capacity

TYPICAL CLASSROOMS		No.	SIZE	Total SF
	Pre-K	2	1250	2500
	K	5	1250	6250
	First	5	1000	5000
	Second	7	1000	7000
	Third	7	1000	7000
	Fourth	7	1000	7000
	Fifth	8	1000	8000
	Sub-Total	41		42750
SUPPORT ROOMS		No.	SIZE	Total SF
	Cultural Arts / Multipurpose	1	3600	3600
	Stage / wings	1	1200	1200
	Music	1	1000	1000
	Visual Arts	1	1200	1200
	Chapter I resource	1	450	450
	Self Cont Autistic /SPH	2	1200	2400
	Self Contained CC	1	850	850
	Time out	1	50	50
	Resource	3	450	1350
	AG	1	650	650
	Speech	1	250	250
	Sub-Total	14		13000
MEDIA CENTER		No.	SIZE	Total SF
	Main Room (5SF/Std)	1	5200	5200
	Media office	1	120	120
	AV production / work room	1	500	500
	Conference / small groups	1	150	150
	Equip stor / distribution	1	175	175
	Computer lab	1	1000	1000
	Computer room control	1	300	300
	Sub-Total	7		7445
PHYSICAL EDUCATION		No.	SIZE	Total SF
	Gym	1	3600	3600
	Equip stor	1	175	175
	Office	1	120	120
	Sub-Total	1		3895
FOOD SERVICE		No.	SIZE	Total SF
	Dining	1	4000	4000
	Serving	1	700	700
	Food prep	1	1200	1200
	Dish wash	1	200	200
	Storage	1	450	450
	Managers office	1	100	100
	Employee toilet	1	150	150
	Loading dock / plant operations	1	800	800
	Sub-Total	8		7600

ADMINISTRATION		No.	SIZE	Total SF
	Principal	1	200	200
	Ass't Principal	1	150	150
	Reception	1	400	400
	IPC ?	1	120	120
	SIMS	1	120	120
	Finance	1	120	120
	Workroom	1	140	140
	Admin work space	1	240	240
	Conference	1	400	400
	Record Storage	1	135	135
	Instructional supply	1	160	160
	Guidance Reception	1	100	100
	Guidance Office	2	120	240
	Testing	2	120	240
	Kids-Plus Office / 2 stations	1	160	160
	Kids-Plus storage	1	300	300
	Health Room	1	150	150
	Nurse office	1	100	100
	Health Room Toilet	1	50	50
	Clothes closet	1	80	80
	Laundry	1	50	50
	Teacher Work	2	400	800
	Teacher Lounge	1	400	400
	Book Storage	1	600	600
	Sub-Total	27		5455
	Sub-Total Net Sq Ft			80145
	HallsRRMechWalls	39%		31524
	TOTAL GROSS SQ FT			111669

Elementary School Standards

- 1) General SITE Requirements:
- 2) General BUILDING Requirements:

Classrooms & Workrooms

- 3) Standard **K-1** Class Room Layout
 - See attached plan
 - See attached cabinetry elevations
 - Standard Size _____ Sq Ft
 - Flooring Type _____ (VCT or Hardwood)
- 4) Standard **2-5** Class Room Layout
 - See attached plan
 - See attached cabinetry elevations
 - Standard Size _____ Sq Ft
 - Flooring Type _____ (VCT or Hardwood)
- 5) Standard **EC** Class Room Layout
 - See attached plan
 - See attached cabinetry elevations
 - Standard Size _____ Sq Ft
 - Flooring Type _____ (VCT or Hardwood)
- 6) Class Room Office
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 7) Self Contained Class Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 8) Speech Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 9) Resource Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

Elementary School Standards

- 10) AG Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 11) Time Out Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 12) Teacher's Work Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 13) Teacher's Lounge
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

Media Center

- 14) Media Office
 - Learning Wall
 - Circulation Desk
 - Book Repository
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 15) AV Production
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 16) Conference / Small Group Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 17) Computer Lab
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

Elementary School Standards

- 18) Computer Office
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

Art, Music , and Cafeteria

- 19) Art Room
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 20) Music Room
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 21) Cafeteria
- Stage
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

Administration

- 22) Principal
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 23) Assistant Principal
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 24) Reception Area
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
- 25) Conference Room
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

Elementary School Standards

- 26) Work Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

- 27) SIMS
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

- 28) Finance
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

- 29) Nurses Office
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

- 30) Health Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

- 31) Work Room
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

Guidance

- 32) Reception
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

- 33) Office
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

- 34) Testing
 - List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)

Elementary School Standards

Gymnasium

- 35) Standard Size (includes Park & Rec): Size _____ Sq Ft
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
 - Court lines: Basketball, Volleyball, Corner Play Areas
 - Basketball Backboards
 - Score Board (#, type, size, location)
 - Sound System
 - Bleachers (Number of Seats)
- 36) Size without Park & Rec option: Size _____ Sq Ft
- List of Components
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
 - Court lines: Basketball, Volleyball, Corner Play Areas
 - Basketball Backboards
 - Score Board (#, type, size, location)
 - Sound System
 - Bleachers (Number of Seats)

Kitchen

- 37) List of Kitchen Areas
- List of Components for each area
 - Example Plan Layout for each area (including size, flooring, data ports, FF&E)
 - Preferred Brand Name Alternates for each area

Elementary School Standards

SITE:

- Student Capacity **800 or 1,000**
- Clone? **YES**___ **NO**___
- Useable Acres **20**
- Parks & Recreation Use? **YES** ___ **NO** ___
 - Increase Acreage for Parks & Rec **acres**
- Bus Lot
 - Bus Parking Spaces **12 - 16**
 - Car Event Parking Spaces **36 - 46**
 - Basketball goals with half-court striping **4**
- Car Parking
 - Staff **130 - 170**
 - Visitors **40 - 60**
 - Total Car Parking **170 - 230** (Range Maybe Determined by Site Limitations)
- Playground **50' X 150'** OR
 - K-1 **50' X 50'** &
 - 2-5 **50' X 100'**
- Play Field
 - Minimum **150 X 250**
 - Enclosed with 4' vinyl coated chain link fence

Elementary School Standards

BUILDING:

- Student Capacity **800 or 1,000**
- Clone? **YES**___ **NO**___
- Exterior
 - One Brick Color
 - One Block Accent Color (split-face or ground-face)
 - Std Grey Mortar
 - Natural Sand
- Main Entrance
 - Prominent Appearance / Obvious
 - Name on Building
 - 2 flag poles
 - Student Drop Off Area
 - Queuing space for _____ cars or Minimum _____ feet
- Canopy(s)
 - Car Drop Off (Main Entrance?)
 - Bus Lot
- Loading Dock (Location & Size)
 - NOT OFF OF BUS PARKING LOT
 - Elevated Area at Dumpsters
- Program of Spaces
 - **See Attachment**

Elementary School Standards

Individual Space Requirements

(Separate Page for Each Space)

- Standard K-1 Class Room Layout
 - **See attached plan**
- Standard 2-5 Class Room Layout
 - **See attached plan**
- Class Room Office Layout
- Self Contained Class Room
- Speech Room
- Resource Room
- AG Room
- Time Out Room
- Teacher's Work Room
- Teacher's Lounge
- Media Center
 - Media Office
 - AV Production
 - Conference / Small Group Room
 - Computer Lab
 - Computer Office
- Art Room
- Music Room
- Cafeteria
 - Stage
- Administration
 - Principal
 - Assistant Principal
 - Reception Area
 - Conference Room

Elementary School Standards

- Work Room
- SIMS
- Finance
- Nurses Office
- Health Room
- Work Room

- Guidance
 - Reception
 - Office
 - Testing

- Gymnasium
 - Standard Size _____ Sq Ft
 - Park & Rec Size _____ Sq Ft

Elementary School Standards

Example of Spaces

- Gymnasium
 - Standard Size _____ Sq Ft
 - Park & Rec Size _____ Sq Ft
 - Flooring Type _____ (VCT or Hardwood)
 - Court Lines
 - Basket Ball
 - Volley Ball
 - Corner Play Areas
 - # Basket Ball Back Boards _____
 - Score Board (#, Type, Size, Location) _____
 - Sound System _____
 - Bleachers (Number of Seats) _____

- Media Center
 - Circulation Desk
 - Learning Wall
 - Carpet
 - Office
 - Connected to Technology Office
 - Connected to 2 computer labs

Elementary School Standards

List of Components for Standard K-1 Classroom

1. Square Feet:
 - a. Kindergarten: 1250 SF
 - b. First Grade: 1000 SF
2. Smart Board Hook up: Power/Data in Ceiling and center front wall
3. Marker Board (2) 4x4
4. Tack Board (2) 4x4
5. Computers (6) Students; (1) Teacher
 - a. Power outlets
 - b. Data hook ups
6. Floor Covering Type:
 - a. VCT at wet areas
 - b. Carpet in balance of room
7. Cabinets: See Layout
8. Intercom
9. Security devices
10. CATV - ??

Elementary School Standards: Principal Feedback

Respondents:

Marion Bish

Phyllis Phifer – Principal Beverly Hills ES

Terri Chaney – Rocky River ES

Cathy Hyatt - Charles E. Boger ES

Judith Mullis – W M Irvin ES

Martha McCall – Harrisburg ES

Lynn Marsh – W R Odell ES

Michael Kelly – Winecoff ES

General Comments:

- Schools should be only 500 Students

Site Comments:

- Parks and Rec should have use of fields and be involved with upkeep of fields
- Bus lot needs to be separate from cars/student arrival/dismissal and bus parking
- Staff and visitor parking needs to be separate
- Canopies need to be located at the bus and car rider drop off / pick up, the front office and near mobile units
- Canopy needed all along car pick and bus lot, not just at entrance (4 principals noted this)
- Make sure DOT clears use of service road for entry and exit before build. Odell has only one way in and out.
- 20 acres is too small for school
- Need more staff parking spots (150)
- Need more visitors parking spots (175)
- Need two play fields
- Parks and Rec partnerships need additional parking spaces, at least 50 more spaces
- Need more K and 1st grade classrooms since the maximum class sizes are smaller
- Separate Faculty parking from Visitors
- Separate bus traffic / faculty parking from visitor – have far apart
- Need more than one Entry/Exit to school property
- More Bus Parking spaces
- Put 4 basketball goals in bus lot, would save on asphalt
- Do not put basketball goals in bus lot.
- Need two playfields separate for scheduling and appropriate equipment / activities
- Name on Entrance is needed
- Queuing space for 10 cars at drop off
- Problems with seeding/reseeding, rocks left after construction
- Student drop off area needs to be long enough to get cars off the street

Elementary School Standards: Principal Feedback

Respondents:

Marion Bish

Phyllis Phifer – Principal Beverly Hills ES

Terri Chaney – Rocky River ES

Cathy Hyatt - Charles E. Boger ES

Judith Mullis – W M Irvin ES

Martha McCall – Harrisburg ES

Lynn Marsh – W R Odell ES

Michael Kelly – Winecoff ES

Building Comments:

- All schools need 2 computer labs
- All schools need a separate conference room in the main office
- More signage or prominent appearance to make visitor's entrance easier to identify
- Include bleachers with building for gymnasium (3 principals noted this)
- SIMS needs largest office
- More guidance offices (3+)
- 2nd courtyard is wasted space (Odell ES design)
- Need 2 speech rooms
- Space for AP & API (not IPC) should be the same at 150 sq. feet
- Resource Room needs larger space. (>450)
- EC population growing, needs more rooms
- Need two teacher workrooms
- Bathroom in classes, not just EC and K-1
- Include Security Entrance to building from office – Parents and Adults enter office in order to obtain entry to building.
- Limit access from Gym to building (Parks and Rec), causes additional custodial work and security issues
- Include storage in resource rooms/offices and in workroom areas
- Sound system brand and installation needs improvement
- Take out orders for TV stands and Projection Screens
- A classroom "core" list for FF&E for each grade level, and an approach for use of the best vendors – preferred vendor list?
- Take out wiring and boiler before giving principals their budgets.
- Create EC Pod, not along the hall (i.e. EC resource across from SC – classrooms both sides of hall at other end.)
- Principal and AP need storage space in offices
- Room for school social worker
- Do not label Teacher Lounge's as "Lounge"
- Loading dock should be situated outside cafeteria door
- Include steps at loading dock to cafeteria door
- Finance Office needs to be in separate space
- Testing Office space needs to accommodate storing test materials
- ESL rooms need to be included in support rooms spaces



EXCEPTIONAL CHILDREN (EC) CLASSROOMS

Programs for exceptional children include those intended to ensure that students with disabilities develop mentally, physically, emotionally, and vocationally to the fullest extent possible through appropriate and individualized education in the least restrictive environment. Exceptional children as students include those who because of either permanent or temporary mental, physical or emotional disabilities are unable to have all of their educational needs met in a regular classroom setting and must have certain educational requirements provided through special education and related services.

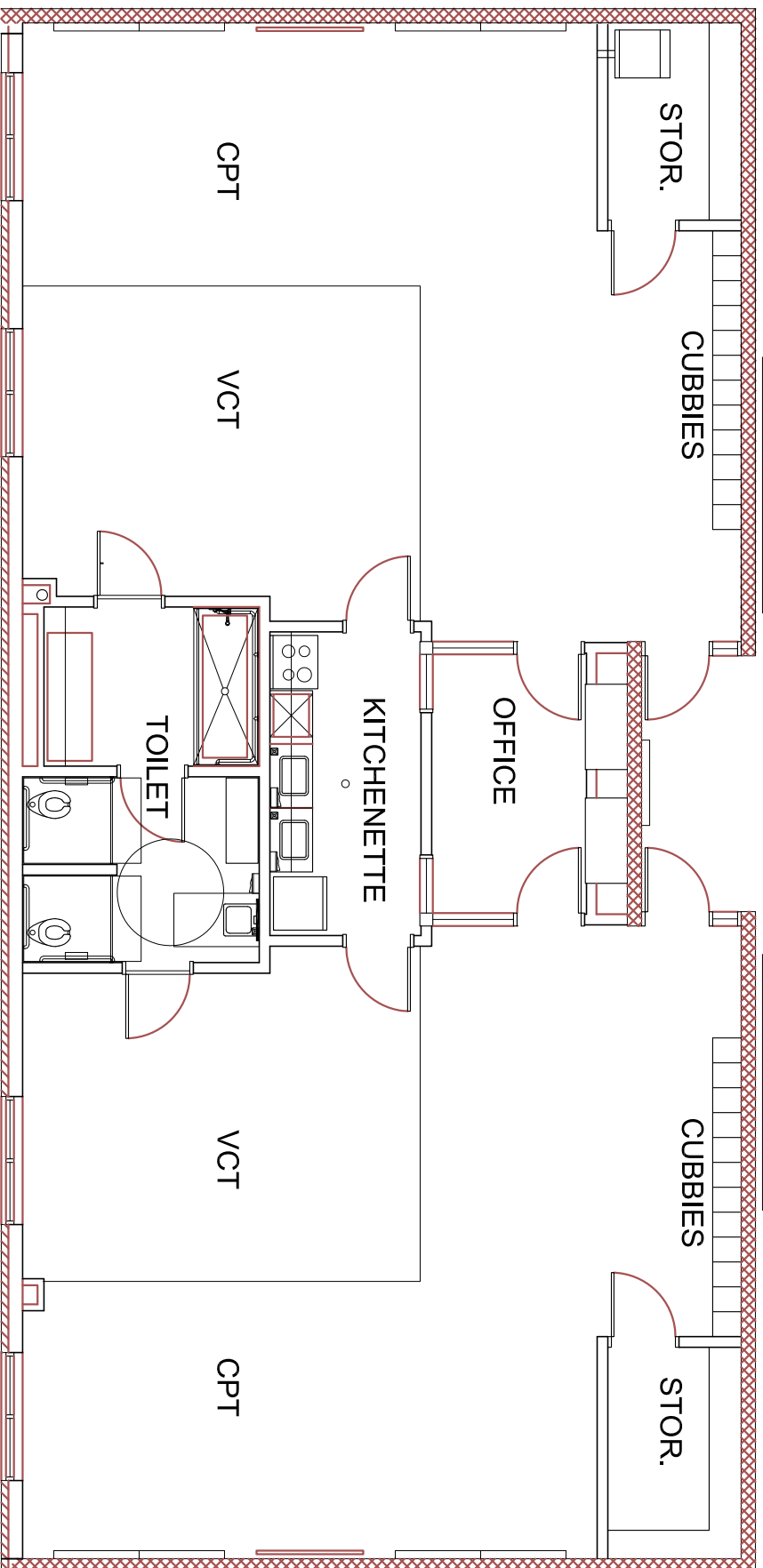
In every school it is the responsibility of Cabarrus County Schools to provide a learning and living environment that helps to support the unique needs of exceptional children. Often however, the design of these classrooms and support areas do not address the special needs of staff who work with these students to make their learning experience more worthwhile. In all cases, the current recommendations of the NC Department of Public Instruction (DPI) should be considered as the minimum space requirements for these classrooms.

CCS has found that in most cases the DPI recommendations fall short of the actual needs for these students and staff. Detailed architectural programming discussions with staff must occur in order to fully identify the needs of the spaces that serve the various types of exceptional students.

Typically CCS has two types of EC classroom designs. The first type of classroom addresses the needs of autistic, visually impaired, deaf and hearing impaired, speech impaired, and the developmentally delayed students. The needs of these students are unique and typically require more space than a typical school classroom and they have special requirements to reduce or control artificial lighting, have special flooring needs and control of daylight. Storage, toilets, and kitchen facilities are provided for the routine needs of these students and to be used for life-skills training.

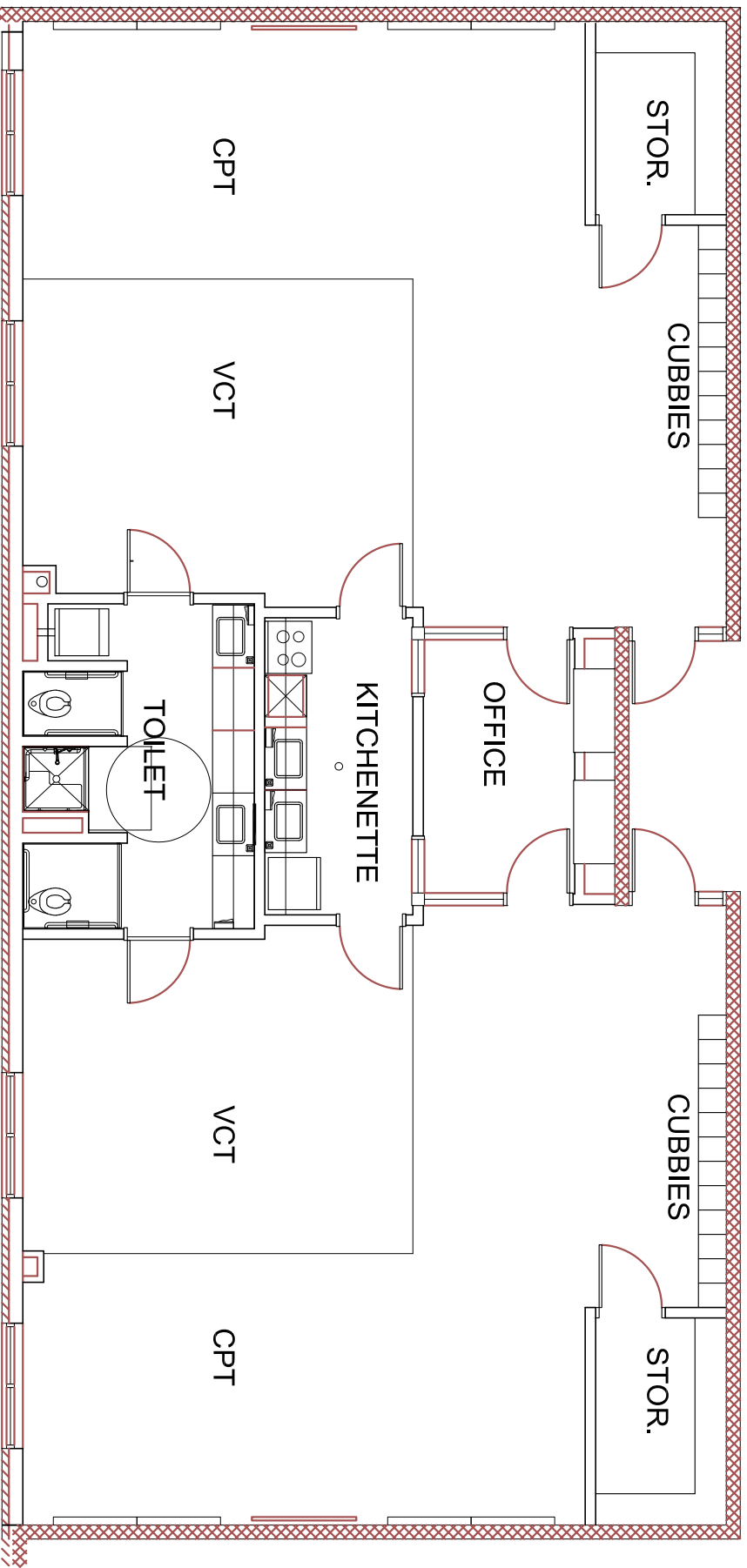
A second type of classroom focuses on the needs of students that are multi-handicapped, have other health impaired problems, or have severe and profound disabilities. The classrooms for these students require even more space than the first type of classroom and in addition, the toilet facilities are typically designed to accommodate students that are unable to assist themselves with personal hygiene issues. The control of artificial lighting and natural light, sound, and finishes and materials are unique to these spaces as well.

The requirements and recommendations shown in the following pages of this section are intended to give direction to the design team. However, this information is only historical in nature and should not be duplicated without further investigation. It is the responsibility of the architect and their consultants to meet with staff and develop the architectural space requirements based on the nature of the students that will be housed in a particular school.



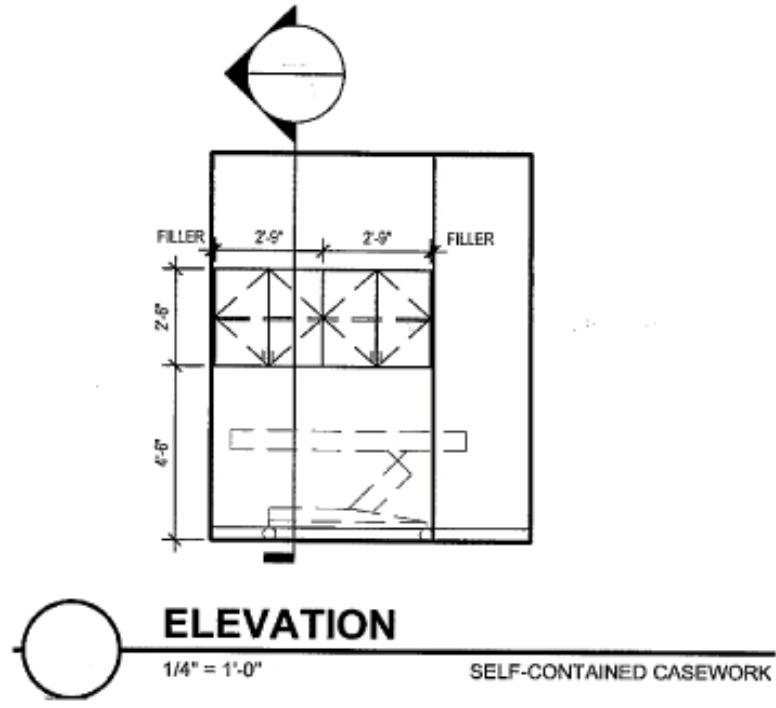
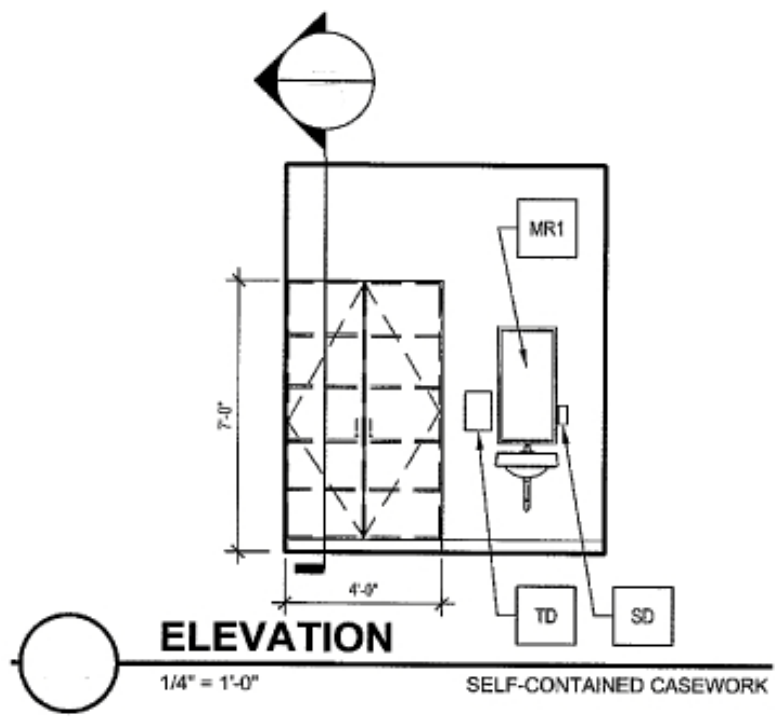
EC CLASSROOM PLAN

1/8"=1'-0"

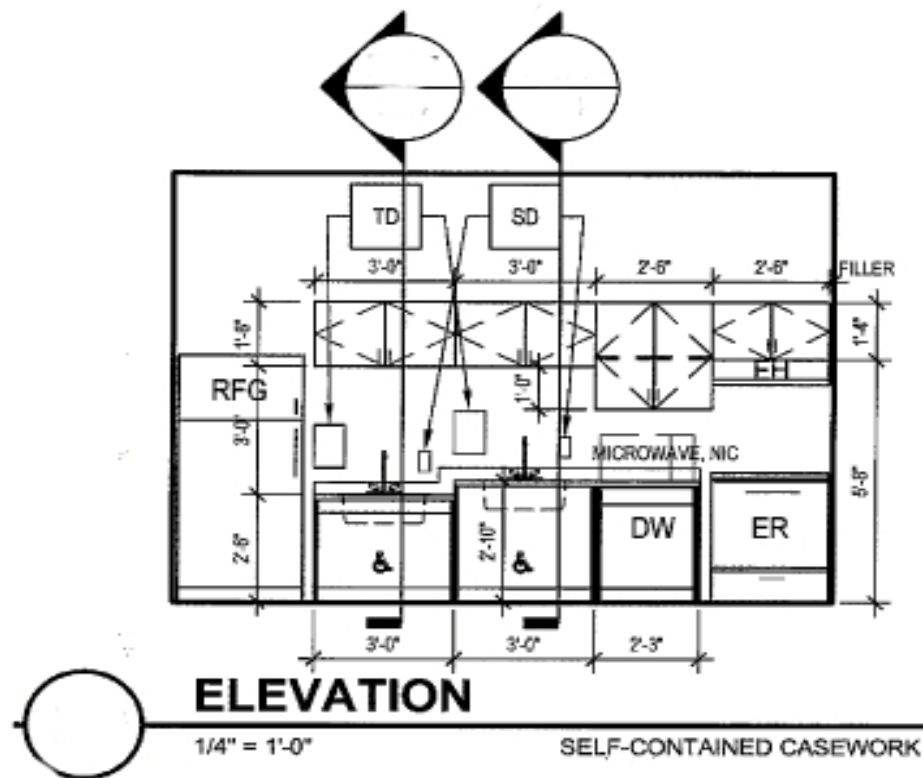


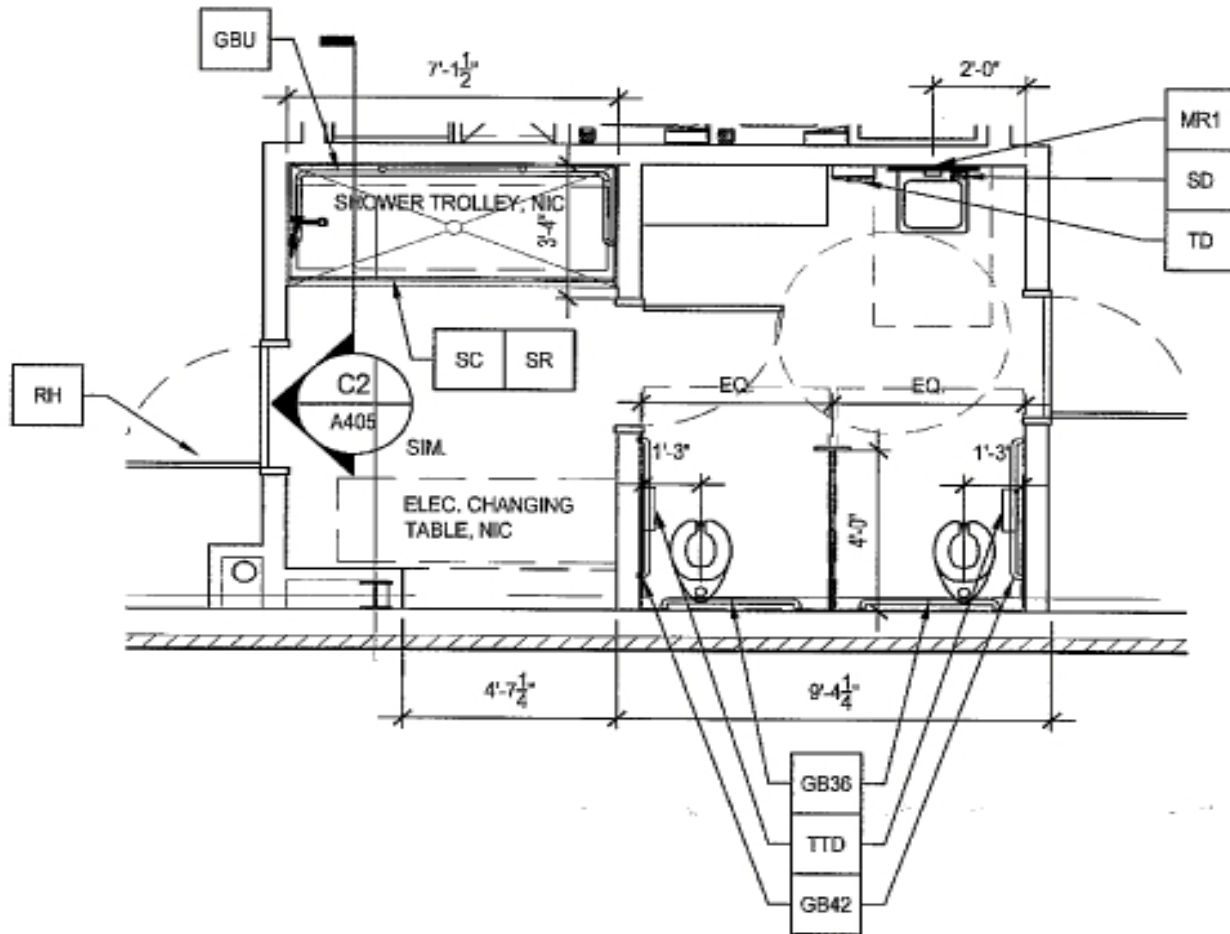
EC CLASSROOM PLAN

1/8"=1'-0"



SPACE AND PROGRAM REQUIREMENTS





ENLARGED PLAN

1/4" = 1'-0"

SELF-CONTAINED

CABARRUS COUNTY SCHOOL
MIDDLE SCHOOL
PROGRAM SUMMARY
 1200 Students

TYPICAL CLASSROOMS	Revised Program		
	No.	Size	Total SF
6th 7th 8th (1T/25Stds)	36	850	30600
Shared Storage			
Science (1T/25Stds)	12	1000	12000
Sub-Total	48		42600
CLASSROOM SUPPORT SPACES			
Grade Level Resource Rooms	3	200	600
Grade Level Science Storage	3	50	150
G. L. Team staff toilet	5	50	250
Computer Lab	2	1000	2000
Keyboarding	1	850	850
Exceptional children / self contained	2	1400	2800
Exceptional children office	1	125	125
Exceptional Resource Rooms	3	700/300=1000	3000
Sub-Total	20		9775
AUXILLARY CLASSROOMS			
Business & Marketing lab	1	1000	1000
Exploring Life Skills lab	1	1400	1400
Pantry storage	1	80	80
Exploring Bio-tech lab	1	1400	1400
Greenhouse	1	300	300
Technology lab	1	1600	1600
Shop / storage	2	200	400
Sub-Total	8		6180
CULTURAL ARTS			
Visual Arts	1	1100	1100
Art storage	1	200	200
Kiln	1	80	80
Band Room	1	1500	1500
Chorus / general music	1	1200	1200
Music library / workroom	1	200	200
Instrument Storage	1	400	400
ESL	1	850	850
Foreign Language	1	850	850
Remediation	2	850	1700
*ALTERNATE Assembly	1	4000	4000
Sub-Total	12		12080

MEDIA CENTER			
	Main Room (5SF/Std)	1	5000
	Support office	1	350
	Workroom / Wiring / Staff Devel.	1	600
	AV storage	1	400
	A/V studio - production	1	200
	Technology office	1	150
	Sub-Total	6	6700
PHYSICAL EDUCATION			
	Gym (50x84Ct+Space)	1	6300
Bleachers	Seats (1000@ 4sf/each)		5400
*ALTERNATE	Aux gym	1	5000
	Concession / storage	1	250
	PE Lockers Boys	1	2000
	PE Lockers Girls	1	2000
	Team room	2	300
	Offices	2	150
	Storage	1	900
	Health classrooms	4	850
	Sub-Total	14	26150
FOOD SERVICE			
	Dining (15SF/Std/4Pds)	1	4300
	Kitchen	1	3200
	Sub-Total	2	7500
ADMINISTRATION			
	Reception / public wait	1	250
	Student wait	1	150
	Principal	1	200
	Ass't Principal	2	150
	API office	1	150
	SIMS	1	150
	Finance	1	150
	Resource officer	1	100
	Workroom / gen. Storage	1	300
	Record Storage	1	150
	Toilet	4	50
	Sub-Total	15	2100

GUIDANCE / HEALTH / ADMIN. SUPPORT			
Guidance reception	1	100	100
Counselor's office	3	150	450
Guidance conference	1	200	200
Itinerant Offices	2	100	200
In school suspension	1	800	800
Health Room / Toilet	1	200	200
Teacher Mail Rm.	1	100	100
Book Storage	1	100	100
Testing Coordinator	1	150	150
Sub-Total	12		2300
Gang Toilets	8	800	6400
Mechanical	1	900	900
Wiring closets	4	100	400
Electrical room	1	200	200
Janitor's closet	4	80	320
Janitor's storage	1	400	400
Sub-Total	19		8620
Sub-Total Net Sq Ft	137		124005
Halls/Walls		Net sq.ft. x .37	45882
Stairwells			3800
TOTAL GROSS SQ FT			173687

Assembly Area Alternate NOT ACCEPTED on Harris Road Middle School

(4000.00)

TOTAL GROSS SQ FT - COMPLETED SCHOOL

169687

Middle School Standards

SITE:

- Student Capacity **1,200**
- Clone? **YES**___ **NO**___
- Useable Acres **40 Min**
- Parks & Recreation Use? **YES** ___ **NO** ___
 - Increase Acreage for Parks & Rec **acres**
- Bus Lot
 - Bus Parking Spaces _____
 - Car Event Parking Spaces _____
 - Basketball goals with half-court striping **4**
- Car Parking
 - Staff _____
 - Visitors _____
 - Total Car Parking _____ (Range Maybe Determined by Site Limitations)
- Baseball Field - **Irrigated – Fenced - Sprigged**
- Softball Field - **Irrigated – Fenced - Sprigged**
- Soccer Field – **Irrigated – Fenced - Sprigged**
- Football Practice Field
 - **Irrigated – Sprigged**
 - Bleachers
 - Home side _____
 - Visitors side _____
 - Concession & Restroom Building – **Centrally Located between Fields**
- Track
 - **8 lanes**
 - **Rubberized Surface**
- Track & Field Events
 - Shot Putt **(with cage)**
 - Discus **(with cage)**
 - High Jump
 - Long Jump
 - Pole Vault

Middle School Standards

BUILDING:

- Student Capacity **1,200**
- Clone? **YES**___ **NO**___
- Exterior
 - One Brick Color
 - One Block Accent Color (split-face or ground-face)
 - Std Grey Mortar
 - Natural Sand
- Canopy(s)
 - Car Drop Off (Main Entrance?)
 - Bus Lot
- Loading Dock (Location & Size)
 - NOT OFF OF BUS PARKING LOT
 - Elevated Area at Dumpsters
- Main Entrance
 - Prominent Appearance / Obvious
 - Name on Building
 - 2 flag poles
 - Student Drop Off Area
 - Queuing space for _____ cars or Minimum _____ feet
- Program of Spaces
 - **See Attachment**

Middle School Standards

Individual Space Requirements

(Separate Page for Each Space)

- Standard Class Room Layout
 - **See attached plan**
 - **See attached cabinetry elevations**
- Standard Science Class Room Layout
 - **See attached plan**
 - **See attached cabinetry elevations**
- Self Contained Class Room
- Speech Room
- Resource Room
- AG Room
- Time Out Room
- Teacher's Work Room
- Teacher's Lounge
- Media Center
 - Media Office
 - AV Production
 - Conference / Small Group Room
 - Computer Lab
 - Computer Office
- Art Room
- Music Room
- Cafeteria
 - Stage
- Administration
 - Principal
 - Assistant Principal
 - Reception Area
 - Conference Room

Middle School Standards

- Work Room
 - SIMS
 - Finance
 - Nurses Office
 - Health Room
 - Work Room
- Guidance
- Reception
 - Office
 - Testing
- Gymnasium
- Standard Size _____ Sq Ft
 - Park & Rec Size _____ Sq Ft

Middle School Standards

Example of Spaces

- Media Center
 - Circulation Desk
 - Learning Wall
 - Carpet
 - Office
 - Connected to Technology Office
 - Connected to 2 computer labs
 - Centrally Located

- Gymnasium
 - Standard Size _____ Sq Ft
 - Flooring Type _____ (Hardwood – Maple #2 or composite)
 - Court Lines
 - Basket Ball
 - Volley Ball
 - Basket Ball Back Boards 6 (power operated)
 - Score Board (#, Type, Size, Location) _____
 - Sound System _____
 - Bleachers (Number of Seats) 1400

- Auxiliary Gymnasium
 - Standard Size _____ Sq Ft
 - Flooring Type _____ (Hardwood – Maple #3)
 - Court Lines
 - Basket Ball
 - Volley Ball
 - Basket Ball Back Boards 2 – one at each end
 - Score Board (#, Type, Size, Location) _____
 - Sound System _____
 - Bleachers (Number of Seats) 3 tier – length of court on one side
 - Mat Hoist

CABARRUS COUNTY BOARD OF EDUCATION

PROGRAM OF SPACES

NEW NORTHWEST AREA HIGH SCHOOL - 1,500 STUDENTS

SPACE	SCHOOL PLANNING RECOMMENDATION	PROPOSED QTY.	SQ. FT. EACH	TOTAL SQ. FT.
ACADEMIC CLASSROOMS				
English	750-850	10	750	7,500
Foreign Language	750-850	6	750	4,500
Social Studies	750-850	8	750	6,000
Math	750-850	10	750	7,500
Resource Rooms		0	0	0
E.S.L.		2	500	1,000
Subtotal Academic Classrooms				26,500
EXCEPTIONAL CHILDREN				
Occupational Education Classroom w/ kit. area (100 SF/Student)	1,200	2	1,200	2,400
Multi-Handicapped Classroom (100 SF/Student)	1,200	1	1,200	1,200
E.C. Classroom	600	2	600	1,200
E.C. Resource Rooms		0	0	0
E.C. Small Group Instruction/Conference Room		1	225	225
E.C. Work Room/Records/Office		1	400	400
Curriculum Assistance Lab	600	2	600	1,200
Toilets/Showers/Laundry		1	300	300
Subtotal Exceptional Children				6,925
SCIENCE LABORATORIES				
Physical Science	1,200	3	1,225	3,675
Biology	1,200	4	1,225	4,900
Chemistry	1,500	2	1,225	2,450
Physics	1,200	1	1,225	1,225
Prep Rooms	250	5	250	1,250
Math/Science Comp. Labs		0	0	0
Subtotal Science Laboratories				13,500

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SPACE	SCHOOL PLANNING RECOMMENDATION	PROPOSED QTY.	SQ. FT. EACH	TOTAL SQ. FT.
ARTS EDUCATION				
Visual Arts	1,200-1,500	2	1,000	2,000
Kiln Room	400	1	250	250
Paper Storage		1	120	120
Visual Arts Office		1	200	200
Display Storage		1	50	50
Instrumental Music	1,600-1,800	1	1,950	1,950
Ensemble/Practice Room		1	350	350
Uniform Storage	400	1	200	200
Instrument Storage	400-600	1	500	500
Percussion Storage		0	0	0
Band Office	150	1	150	150
Music Library	200	1	200	200
Practice Rooms		3	50	150
Instrument Repair		0	0	0
Color Guard Storage		1	100	100
Vocal Music	1,000-1,500	1	1,250	1,250
Vocal Music Office		1	120	120
Vocal Music Storage	200	1	150	150
Vocal Music Library		0	200	0
Vocal Music Uniform Storage		0	0	0
Drama (Classroom/Office/Storage)	1,800-2,000	1	1,600	1,600
Auditorium	(8-10 SF/Seat)	700	7,250	7,250
Stage/Dressing/Storage		1	4,000	4,000
Lobby/Concessions/Commons		1	3,750	3,750
Subtotal Arts Education				24,340

CABARRUS COUNTY BOARD OF EDUCATION

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SPACE	SCHOOL PLANNING RECOMMENDATION	PROPOSED QTY.	SQ. FT. EACH	TOTAL SQ. FT.
CAREER TECHNICAL EDUCATION				
Horticulture Education Lab	2,500-3,000	1	2,500	2,500
Horticulture Education Classroom		1	800	800
Greenhouse (include \$85,000 in construction budget for this)		0	3,000	0
Aquaculture		0		
Biotech - Classroom	1,400-2,000	2	1,400	2,800
Biotech - Lab	1,400-2,000	2	1,400	2,800
Business Education Classroom	1,200-1,400	1	1,200	1,200
Business Education - Computer Classroom	1,200-2,000	3	1,200	3,600
Family and Consumer Sciences	1,400-1,600	1	1,400	1,400
Apparel Development/Housing & Interior Design	1,400-1,600	1	1,400	1,400
Culinary Arts Lab	1,600-2,000	0	1,600	0
Digital Media Lab	1,200-1,400	0	1,200	0
Child Development		0	0	0
Marketing	1,000-1,200	1	1,000	1,000
Health Occupations	2,000-2,500	1	1,400	1,400
Fundamentals of Technology Classroom	1,800-2,000	1	1,800	1,800
Drafting	1,600-2,000	1	1,600	1,600
Construction Technology Lab	2,500-3,000	0	0	0
Electrical Trades Lab	1,600-2,000	0	0	0
Electronics/HVAC Classroom		0	0	0
Electronics/HVAC Lab	1,600-2,000	0	0	0
Auto Technology Lab	2,500-3,000	0	2,500	0
Masonry Lab	2,500-3,000	1	2,500	2,500
Masonry Classroom		1	600	600
Auto Technology Classroom		0	600	0
ICT Office		0	0	0
CDC Office		1	150	150
Subtotal Career Technical Education				25,550

CABARRUS COUNTY BOARD OF EDUCATION

PROGRAM OF SPACES

NEW NORTHWEST AREA HIGH SCHOOL - 1,500 STUDENTS

SPACE	SCHOOL PLANNING RECOMMENDATION	PROPOSED QTY.	SQ. FT. EACH	TOTAL SQ. FT.
MEDIA CENTER				
Media/Reading Room	(4-6 SF/Student)	1	6,000	6,000
Administration Office	2,000 SF Total Support	1	200	200
Seminar Room		0	0	0
Video Production Room		1	400	400
Media Distribution		1	300	300
Staff Production		1	200	200
A/V Equipment		1	200	200
Workroom		1	400	400
Main Communications Room		1	180	180
Distance Learning		0	1,000	0
Distance Learning Control Room		0	200	0
I.S.S. Room (don't want in Media Center? Locate near AP office)		1	1,000	1,000
Y.E.S. Center		1	750	750
Computer Rooms	850-1,000	2	900	1,800
Subtotal Media Center				11,430
HEALTH AND PHYSICAL EDUCATION				
Lobby/Concessions/Commons		1	3,750	3,750
Main Gym	(1,500 Seats)	1	14,500	14,500
Locker Rooms (Was 800 SF - Need 1,200 SF w/out field house)		4	1,200	4,800
Shower/Toilets		2	550	1,100
Coach's Office/Toilet		2	450	900
Training		1	550	550
Laundry		1	200	200
Equipment Storage		2	250	500
Athletic Director's Office		1	150	150
Auxiliary Gym		1	6,000	6,000
Weight Room (was 1,500 SF @ HRHS)	2,000-3,000	1	2,500	2,500
Health/P.E. Classrooms		2	750	1,500
Subtotal Physical Education				36,450

CABARRUS COUNTY BOARD OF EDUCATION

PROGRAM OF SPACES

NEW NORTHWEST AREA HIGH SCHOOL - 1,500 STUDENTS

SPACE	SCHOOL PLANNING RECOMMENDATION	PROPOSED QTY.	SQ. FT. EACH	TOTAL SQ. FT.
FOOD SERVICE				
Dining	(3 Seatings @ 15 SF/ Student)	1	7,500	7,500
Kitchen	(2,880 Total Kitchen)	1	1,800	1,800
Serving	950	1	800	800
Manager's Office		1	120	120
Dish Room		1	230	230
Storage		1	300	300
Freezer/Cooler		1	350	350
Toilet/Lockers		1	150	150
Subtotal Food Service				11,250
ADMINISTRATION				
Principal	200	1	200	200
Assistant Principal	150	4	150	600
Reception	400	1	600	600
Secretary	150	2	150	300
SIMS	200	1	300	300
Attendance		1	140	140
Health Office	150	1	350	350
Office Workroom	200	1	400	400
Conference	200	1	300	300
Office Storage	100	1	150	150
Bookkeeping		1	150	150
Intervention Room		1	600	600
Book Storage		1	500	500
General Storage		1	200	200
Files		1	200	200
Subtotal Administration				4,990

CABARRUS COUNTY BOARD OF EDUCATION

PROGRAM OF SPACES

NEW NORTHWEST AREA HIGH SCHOOL - 1,500 STUDENTS

SPACE	SCHOOL PLANNING RECOMMENDATION	PROPOSED QTY.	SQ. FT. EACH	TOTAL SQ. FT.
GUIDANCE				
Secretary/Reception		1	300	300
Conference/Testing		1	250	250
Small Conference		1	180	180
Counselor Office	150	5	150	750
Itinerant Office		2	100	200
Resource Officer		1	120	120
Records and Workroom		1	300	300
Subtotal Guidance				2,100
STAFF SUPPORT				
Teacher Office/Workrooms	80-100/Teacher	4	675	2,700
Foreign Language Workroom	80-100/Teacher	1	400	400
Teacher Lounges		2	250	500
Subtotal Staff Support				3,600
TOTAL				166,635
Circulation, Toilets, Mechanical, Technology (40%)				65,824
				Note: Reduce width of classroom corridors from 15 ft. to 12 ft.
GRAND TOTAL				232,459
Square Feet per Student		(1,500 Students)		155

Athletic Fields & Equipment (everything shown at Hickory Ridge except the field house)

1. Football stadium w/ home & visitor's bleachers, concessions & restrooms.
2. Stadium Lights
3. Press Box
4. Running track
5. Track & field events
6. Baseball field & Softball field w/ concessions & restrooms
7. Baseball & Softball field lights
8. Soccer field
9. Tennis courts (w/ lights?)
10. 2 practice fields
11. "Area" for Field House with utilities 5 feet outside of building.

High School Standards

SITE:

- ◆ Utility Easements needed for School-Staff / BOE approve
- ◆ Student Capacity 1,500
- ◆ Useable Acres 70
- ◆ Parks & Recreation Use? (Increase Acreage) N/A
- ◆ County Joint Use – (Emergency Shelter & Generator, etc.)
- ◆ Landscaping
 - All drought-resistance varieties of trees and shrubs
 - Grass
 - Playing Fields – Bermuda Sprigged
 - Lawn Areas – Bermuda (Preferred but Seasonally dependant)
- ◆ Bus Parking Lot
 - Bus Parking Spaces _____
 - Car Event Parking Spaces _____
- ◆ Car Parking – Average CMHS, HRHS, JMRHS – Range is Site Dependant
 - Staff _____
 - Visitors _____
 - Student _____
 - Total Car Parking _____
- ◆ Football Stadium – 2 Flag poles
 - Football Field – Irrigated – Sprigged with Bermuda
 - Lighted
 - Fenced
 - Home Side
 - Announcer’s Box – Stadium
 - Ticket booth
 - Concessions
 - Restrooms
 - Bleachers # 2100 seats – CMHS
 - Visitor’s Side
 - Concessions
 - Restrooms
 - Bleachers # 1000 seats = Playoff Range
 - Separated
 - 30 second Clocks (2)
 - Scoreboard – wireless

High School Standards

- Track
 - 8 lanes
 - 2" Asphalt over 6" Stone??
 - Surface – Rubberized? – alternates
- Track & Field Events
 - Shot Putt – Fenced
 - Discus – Fenced
 - High Jump
 - Long Jump
 - Pole Vault

- ◆ Playing Fields
 - Baseball Field – Sprigged – Irrigated – Lighted – Fenced
 - Softball Field – Sprigged – Irrigated – Lighted – Fenced
 - Soccer Field – Sprigged – Irrigated
 - Practice Field – Irrigated – Seed Bermuda

- ◆ Tennis Courts 6 – Fenced

- ◆ Band practice Field Inventory Principals – Check Band People, close to school

- ◆ ROTC Practice Area 50x50 Concrete pad

- ◆ Other Components
 - Greenhouse
 - Storage Building – 30x50 Fenced
 - Offsite Roadway improvements
 - Traffic Signals

High School Standards

BUILDING:

- ◆ Student Capacity 1,500
- ◆ County Joint Use – (Emergency Shelter & Generator, etc.)
- ◆ Exterior:
 - One Brick Color
 - One Block Accent Color (split-face or ground-face)
 - Std Grey Mortar
 - Natural Sand
- ◆ Hall Sizes
 - Main Hallways 12' w/out lockers – 16' w/ lockers (including lockers)
 - Branch Hallways 10' – 12' with lockers
 - Commons Areas 40' max
- ◆ Loading Dock (Location & Size)
 - Separate Entrance to dock not through kitchen (for custodians)
 - Band Entrance directly to loading dock
 - NOT OFF OF BUS PARKING LOT
 - Elevated Area at Dumpsters
- ◆ Main Entrance
 - Prominent Appearance / Obvious
 - Name on Building
 - Address on Building
 - 2 flag poles
 - Student Drop Off Area
 - Queuing space for _____ cars or Minimum _____ feet
 - Per NCDOT requirements
- ◆ Program of Spaces
 - SEE ATTACHMENT

High School Standards

Individual Space Requirements

(Separate Page for Each Space)

- Standard Class Rooms
 - English
 - Social Studies
 - Foreign Language
 - Health
 - Math
 - Health

- Science Class Rooms
 - Prep Rooms
 - Biology
 - Physical Science
 - Chemistry
 - Physics

- CTE Class Rooms & Labs
 - Bio-Tech
 - Drafting
 - Technology
 - Interior Design
 - Horticulture
 - Masonry
 - Culinary Arts
 - Technology

- Specialty Class Rooms
 - Art
 - EC
 - ESL
 - Music
 - Band
 - Drama

- Special Areas
 - Media
 - Auditorium
 - Stage
 - Gymnasium
 - Auxiliary Gymnasium
 - Weight Room
 - Multipurpose Fitness Room
 - Kitchen
 - Cafeteria
 - Guidance
 - Administration
 - Locker Rooms
 - Training Room

High School Standards

Example of Spaces

Gymnasium

- Standard Size _____ Sq Ft
- Flooring Type # 2 Maple Hardwood
- Court Lines
 - Basket Ball 1
 - Volley Ball 3 - Standards
- # Basket Ball Back Boards 6 Each - Motorized
- Score Board (#, Type, Size, Location) _____ wireless _____
- Sound System _____
- Bleachers (Number of Seats) 1,750 (Capacity + 250)
- Lighting _____

Auxiliary Gymnasium

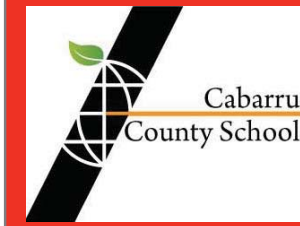
- Standard Size _____ Sq Ft
- Flooring Type #3 Maple Hardwood
- Court Lines
 - Basket Ball 1
 - Volley Ball _____
- # Basket Ball Back Boards 2 - Motorized
- Score Board (#, Type, Size, Location) _____
- Sound System _____
- Bleachers (Number of Seats) _____
- Mat Hoist

High School Standards

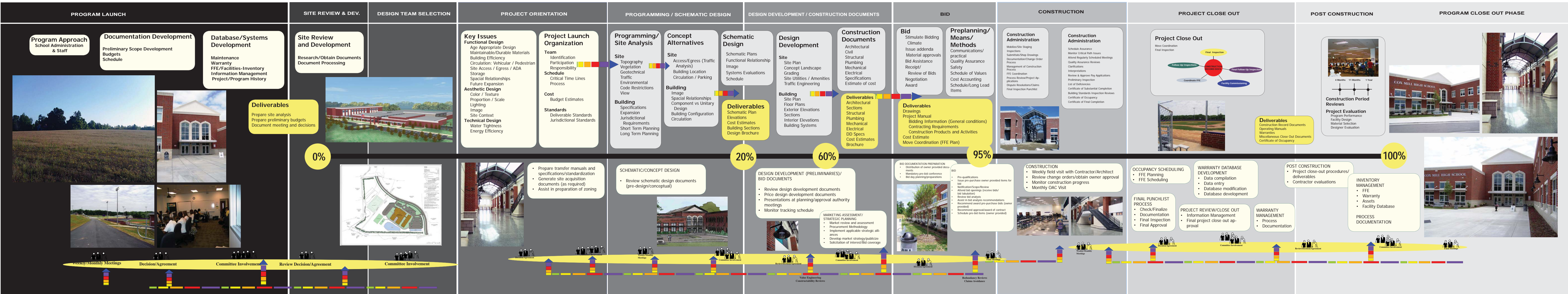
Plumbing Systems Standards:

Mechanical Systems Standards:

Electrical Systems Standards:



CABARRUS COUNTY SCHOOLS: PROGRAM MANAGEMENT : PROCESS METHODOLOGY





SPECIFICATION STANDARDS

03 30 00 - CAST-IN-PLACE CONCRETE

PRODUCTS

- A. Use Chemical Hardener or Surface Sealer on all interior concrete slabs to remain exposed.
- B. At exposed concrete floors use clear epoxy seal.
Allow concrete to cure for 30 days prior to application of seal. Follow manufacturer's recommendation for surface preparation. Apply two (2) coats of clear solvent base epoxy seal. In the event that North Carolina changes its ambient air quality standard preventing the use of a solvent base, a water base epoxy seal should be used.
- C. Concrete coloring agent, if used, shall be a reactive water based solution of metallic salts. This floor shall be sealed.

EXECUTION

- A. CONTROL JOINTS
Construct using pre-molded key joints, inserts, tooled joints or sawcut joints. Minimum depth of control joints shall be one-fourth (1/4) of the slab thickness. Maximum spacing of joints shall be 15 ft. by 15 ft. Isolate all slabs from exterior walls. No semi-rigid filler.
- B. REINFORCEMENT
Position support and secure reinforcement against displacement.
- C. PLACEMENT
Comply with ACI 318.
- D. FLOOR SURFACE TOLERANCE
Unless otherwise indicated all concrete slabs shall be moderately flat classification as stated in ACI 117 "Specifications for Tolerances for Concrete Construction and Materials." This classification uses the method defined in ASTM E 1155 for measurement of the floor flatness. The ACI 117 "moderately flat" classification requires an overall surface tolerance of FF/FI - 25/20.

Designer shall call for the Contractor to coordinate the levelness that is necessary for the maple gym floor.

Contractor shall be responsible to control rinse water runoff.

END OF 03 30 00



SPECIFICATION STANDARDS

03 52 16 - LIGHTWEIGHT INSULATING CONCRETE

GENERAL

The use of cast-in-place perlite aggregate-type lightweight insulating concrete is acceptable for roof decks.

Coordinate this product with the requirements of the single ply roof.

PRODUCTS

- A. Produce cellular lightweight insulating concrete with the following minimum physical properties using cementitious materials, air-producing liquid-foaming agents, and the minimum amount of water necessary to produce a workable mix. Available manufacturers: subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
1. Celcore Incorporated
 2. Elastizell Corporation of America
 3. Lite-Crete Inc.
 4. Siplast

EXECUTION

- A. Control Joints: Install control joints at perimeter of roof deck and at junctures with vertical surfaces, including curbs, walls, and vents, for full depth of lightweight insulating concrete. Fill control joints with joint filler. Mix and place lightweight insulating concrete according to manufacturer's written instructions, using equipment and procedures to avoid segregation of mixture and loss of air content.
- B. Install insulation board according to lightweight insulating concrete manufacturer's written instructions.

END OF 03 52 16



SPECIFICATION STANDARDS

04 20 00 - MASONRY

GENERAL

Cabarrus County Schools have developed a consistent color palette for their school facilities. In general the use of red clay brick veneer with CMU and cast stone accents is desired.

Color and texture of masonry installed at the base of buildings should take into consideration the potential for staining from the predominant natural soil composition that include light brown to red clay.

Cavity wall (masonry veneer on concrete masonry unit back-up) and veneer wall (masonry veneer on steel stud back-up with cavity space) construction is acceptable at exterior masonry walls.

Control joints, expansion joints and flashing shall be located and installed as per the recommendations of the Brick Institute of America and National Concrete Masonry Association. Tolerance and quality of workmanship shall be equal to or better than ACI 530.

Concrete CMU shall meet or exceed ASTM 119 standards for CMU.

The Designer is encouraged to use a brick allowance when specifying brick.

PRODUCTS

- A. All concrete masonry units shall be kept free from coal cinder aggregate, waste products, organic impurities, and any other deleterious substance that will cause rusting, staining or pop outs.
 - 1. Blended and light weight concrete masonry units free from the above impurities and substances are acceptable for use.
 - 2. Fly ash is acceptable in concrete masonry units.
- B. Face brick shall be through the body modular brick.
 - 1. Flashed brick is acceptable.
 - 2. A running bond course is strongly recommended. Modular brick is the District's first choice for size of brick.
 - 3. Utility brick is also acceptable as a secondary choice.
- C. Weeps shall be plastic.

EXECUTION

- A. MASONRY
Particular attention shall be given to workmanship.
- B. COLD WEATHER MASONRY
Masonry may be laid when the temperature of the outside air is below 40 deg. F. if protection requirements are in compliance with "Recommended Practices for Cold Weather Masonry Construction", as published by the International Masonry Industry All-Weather Council. Accelerator or water-reducing admixtures are not allowed.
- C. Rinse water run-off shall be controlled during clean up.
- D. Cavities shall be kept clean of mortar drippings.
- E. Do not use raked mortar joints.
- F. Through-wall flashing shall always be installed at interruptions of masonry face plane, i.e., windows, bondbeams, etc. See Section 07 60 00 for additional information.
- G. Use Bituminous damp proofing the outside face of the interior wythe.
- H. At all interior building expansion joints in walls adjacent to high traffic areas vandal resistant metal covers shall be provided.
- I. Contractor is responsible to temporarily shore masonry as necessary.

END OF 04 20 00



SPECIFICATION STANDARDS

05 12 00 - STRUCTURAL STEEL

GENERAL

This section includes fabrication and erection of structural steel work.

PRODUCTS

Metal surfaces, structural steel shapes, cold formed steel tubing, steel pipe, headed stud-type shear connectors, anchor bolts, unfinished threaded fasteners, high-strength threaded fasteners, electrodes for welding, structural steel primer paint, bituminous paint & non-metallic shrinkage-resistant group.

Steel shall meet SP3 Surface Preparation Standard.

Specify the structural steel necessary to support the operable partitions.

EXECUTION

Provide temporary shoring and bracing members as needed.

Provide erection and installation of items per product requirements.

Qualifications for Welding Work: Qualify welding procedures and welding operators in accordance with AWS "Qualification" requirements.

Installer Qualifications: Engage an experienced Installer who has completed structural steel work similar in material, design, and extent to that indicated for the Project and with a record of successful in-service performance.

Fabricator Qualifications: engage a firm experienced in fabricating structural steel similar to that indicated for the project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the work.

END OF 05 12 00



SPECIFICATION STANDARDS

05 50 00 - METAL FABRICATION

GENERAL

This section includes miscellaneous metal fabrication.

PRODUCTS

- A. RAILS
Exterior rails shall be aluminum or primed steel.
- B. INTERIOR METAL STAIRS
Stair stringers shall be steel channels or tubing. Interior stair rails at exits shall be standard design, 1.5" O.D. diameters. Interior stair rails may be more elaborate at monumental stairs.
- C. LADDERS
Provide metal ladder to roof with locked scuttle or ladder guard. Provide stair for roof access, if feasible. Ladders shall be OSHA compliant.
- D. LINTELS
Provide galvanized lintels at all exterior locations.
- E. BOLLARDS
Fabricate pipe bollards from Schedule 40 steel pipes.

EXECUTION

- A. CODES AND STANDARDS
Comply with applicable provisions of AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" and AWS "Structural Welding Code," unless otherwise indicated.
- B. LADDER
Shall be attached or anchored in solid building materials. Anchoring in drywall is unsafe and will not be acceptable.
- C. WARRANTY
Ladder shall carry a limited warranty of five (5) years.

END OF 05 50 00



SPECIFICATION STANDARDS

06 10 00 - ROUGH CARPENTRY

GENERAL

- A. GRADING AND INSPECTION AGENCIES: Each piece of lumber or plywood shall be grade stamped by one of the following agencies:
1. APA- American Plywood Association
 2. CRA- California Redwood Association
 3. SPIB- Southern Forest Products Association
 4. WWPA - Western Wood Products Association

PRODUCTS

- A. LUMBER, GENERAL
1. Provide seasoned lumber 19 percent maximum moisture content.
 2. Provide preservative treated lumber for cants, nailers, blocking, furring, grounds, stripping and similar items in connection with roofing, flashing and waterproofing or in direct contact with concrete or masonry.
- B. BUILDING WRAP
1. Tyvek or equal shall be used at brick/stud wall construction.
- C. PRESERVATIVE TREATED WOOD
1. All preservative treated lumber and plywood shall be pressure treated with water-borne preservatives to comply with AWPA C2 and C9.
- D. Provide wood blocking at all, but not limited to, handrails, wall door stops, toilet accessories, marker boards and tackboards.
1. Designer shall show blocking on drawings.
 2. Provide treated wood blocking under lockers.

EXECUTION

Store lumber and plywood materials off the ground and under cover which has been vented to prevent condensation.

Do not use material that has been exposed to weather long enough to show signs of warping, discoloration or excessive moisture.

END OF 06 10 00



SPECIFICATION STANDARDS

06 20 00 - FINISH CARPENTRY

GENERAL

- A. GRADING AND INSPECTION AGENCIES: Each piece of lumber or plywood shall be grade stamped by one of the following agencies:
1. APA - American Plywood Association
 2. CRA - California Redwood Association
 3. SPIB - Southern Forest Products Association
 4. WWPA - Western Wood Products Association
 5. WMMP - Wood Molding and Millwork Producers

PRODUCTS

- A. LUMBER STANDARDS
1. Comply with PS 20 "American Softwood Lumber Standard".
- B. PLYWOOD STANDARDS
1. Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood and for products manufactured under PS 1, with APA PRP-108.
- C. ADHESIVES AND SEALANTS:
1. All adhesives and sealants, regardless of where they are used, must comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24):
 - a. Wood Glues: 20 g/L
 - b. Millwork and Casework Adhesives: 20g/L
 2. Interior sealants shall not contain: mercury, butyl rubber, neoprene, SBR (styrene butadiene rubber), or nitrile.
 3. Sealants and glazing compounds formulated with aromatic solvents (organic solvent with a benzene ring in its molecular structure) fibrous talc or asbestos, formaldehyde, halo-genated solvents, mercury, lead, cadmium, hexavalent chromium, or their components shall not be used.
 4. Adhesives used to apply laminates, whether shop-applied or field-applied, shall contain no urea-formaldehyde.

EXECUTION

Store lumber and plywood materials off the ground and under cover which has been vented to prevent condensation.

Cope at returns and miter at corners to produce tight fitting joints.

Use scarf joints for end-to-end joints.

Repair damaged or defective finish carpentry where possible to eliminate functional or visual defects.

Where not possible to repair, replace finish carpentry.

Adjust joinery for uniform appearance.

END OF 06 20 00



SPECIFICATION STANDARDS

07 00 00 - THERMAL & MOISTURE PROTECTION

GENERAL

CCS will provide Design firms with a Registered Roof Consultant (RRC) if their contract involves any roofing, including but not limited to: new construction, roof replacement, modifications to existing roof systems, including new penetrations.

All roofing plans, details and specifications shall be stamped with a RRC seal by the registered roof consultant.

The RRC shall write and furnish the Design/Engineering firm, all (Division 7) specification sections related to the roof design, including all components.

PRODUCTS

A. MEDIUM SLOPED ROOFS

1. Standing seam metal roofing is preferred.
2. Dimensional, asphalt shingle roofing weighing 250 lbs/square or greater is acceptable, with the special consent of the Owner, prior to the start of Design Development phase.

B. LOW SLOPE ROOFS

1. Modified bitumen and built up roof systems or TPO roof.
2. Color: White.
3. Minimum slope to point of discharge shall be 1/4 in. per foot.
4. Roof walk pads shall be installed from access point to any roof mounted equipment or other areas requiring maintenance.
5. Roof is non ballast, fully adhered.

C. CANOPIES AND COVERED WALKWAYS

1. Provide overhead canopies at primary building entrances as per Section 10 73 26.
2. Sheet metal panel systems are recommended for soffit construction.
3. Stucco and drywall soffits shall not be used.
4. Gutters and downspouts may be used at covered walkways as long as run-off is directed away from walks or is discharged into underground storm drain lines.

D. WALL AND ROOF INSULATION

1. The maximum U-value shall be 0.10 for wall construction and 0.05 for roof construction.
2. All insulation shall be CFC free.
3. Designers are encouraged to consider lower U-values based on life-cycle cost analysis.
4. In new construction, insulation shall not be used as the primary method to assure proper drainage; rather the use of sloped steel members is preferred.

5. Rigid board insulation is acceptable for use for small (800 sq. ft. or less) roof areas with the special consent of the Owner, prior to the start of Design Development Phase.
 6. Use of tapered insulation over flat roof deck is acceptable, with the written consent of the Owner, prior to the start of Design Development Phase.
- E. SKYLIGHTS
1. Overhead sloping glazing shall be used only with the written consent of the Owner, prior to the start of Design Development Phase.
 2. Where day-lighting of interior spaces is desired, vertical clerestory glazing is recommended for use.
 3. Where practical the clerestory glazing shall face north or face south with vertical overhang solar protection.
- F. Use of a drainable EFIS (Exterior Finish Insulation System) is acceptable above 12'.

EXECUTION

- A. ROOF INSULATION: shall require certification that insulation meets Thermal Warranty.
1. Warranty states that roof insulation's actual thermal resistance will not vary by more than 10% from the published U-Value for a period of fifteen (15) years.
- B. Registered Roof Consultant shall be responsible for review and acceptance of all shop drawings and submittals pertaining to roof construction.
- C. Registered Roof Consultant shall be responsible for monitoring roof construction and final acceptance.
1. Weekly inspection reports are required to be submitted to Cabarrus County School System, the contractor and the Designer/Engineer within three (3) working days of each visit.
 2. Roofing manufacturers' representative shall inspect surface prior to installation of roofing and at final inspection, prior to issuance of Warranty.
- D. Warranty: See Section 01 77 00 for warranty information.

END OF 07 00 00



SPECIFICATION STANDARDS

07 10 00 - WATERPROOFING

GENERAL

All below grade wall construction of interior spaces and elevated floor construction at toilet rooms and showers shall be waterproofed.

PRODUCTS

A. WATERPROOFING

1. 3-Ply bituminous waterproofing using either coal-tar pitch or asphalt bitumen and felt is recommended for use.
2. Sheet membrane and fluid-applied waterproofing shall be used only with the Owner's written approval.

B. PROTECTION COURSE

1. Where exposed to earth and crushed stone backfill; provide a protection course with drainage medium over completed waterproofing.
2. For bituminous waterproofing this shall be 1/2 in. asphalt saturated and coated fiber insulation board or 1/8 in. premolded, asphaltic-laminated, semi-rigid composition board.

EXECUTION

A. ELEVATED FLOOR WATERPROOFING

1. Turn up membrane 4 in. at walls.
2. Prior to installation of finish flooring, flood entire waterproofed area for 24 hours with water at least 2 in. deep at shallowest point.
3. Repair any leaks and retest. This shall be done until floor is leak free.
4. Slope floors to drain per local jurisdiction.

END OF 07 10 00



SPECIFICATION STANDARDS

07 11 13 - BITUMINOUS DAMPPROOFING

GENERAL

This section includes cold-applied, emulsified-asphalt dampproofing applied to the exterior face of inner wythe of exterior masonry cavity walls.

PRODUCTS

MANUFACTURERS:

Cold-Applied, Emulsified-Asphalt Dampproofing:

- a. Kamak Corporation
- b. Meadows, W.R., Ind.
- c. Sonneborn, Div. of ChemRex, Inc.

EXECUTION

Comply with manufacturer's written recommendations.

Apply additional coats if recommended by manufacturer or required to achieve coverage indicated.

Allow each coat of dampproofing to cure 24 hours before applying subsequent coats.

Apply from finished-grade line to top of footing; extend over top of footing, and down minimum of 6 inches (150 mm) over outside face of footing.

Extend 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.

Apply primer and one brush or spray coat at not less than 4 - 6 gal/100 sq. ft. (0.4 L/sq.m) unless otherwise recommended by manufacturer.

END OF 07 11 13



SPECIFICATION STANDARDS

07 31 13- ASPHALT SHINGLE ROOFING

GENERAL

ASPHALT SHINGLES SHALL MAINLY BE USED TO MATCH EXISTING ROOFS AND ON CERTAIN OUTBUILDINGS, HOWEVER, WHERE REQUIRED BY PROJECT BUDGET CONSTRAINTS, ASPHALT SHINGLE ROOFING IS ACCEPTABLE, WITH THE WRITTEN CONSENT OF THE OWNER, FOR USE ON MEDIUM PITCHED ROOFS, 4/12 MINIMUM SLOPE.

Provide roof tie-off hooks as required by OSHA. Reference current edition of the North Carolina Occupational Safety and Health Standards for the Construction Industry, Section 1926.500.

Provide tie-off hook every thirty (30) feet, at roof ridge.

Prime and paint to match shingle color.

PRODUCTS

- A. ASPHALT SHINGLE ROOFING: shall be dimensional, laminated strip shingle of mineral surfaced, algae resistant, self sealing, laminated multi-ply overlay construction, bearing UL Class "A" external fire exposure label and UL "Wind Resistant" label, weighing not less than 250 lbs. per square.
- B. ROOFING FELT: shall be No. 15 asphalt-saturated unperforated organic roofing felt complying with ASTM D226, 36 in. wide, approximate weight 18 lbs. per square.
- C. ICE AND WATER BARRIER: shall be used at roof eaves, ridges, hips, valleys, and roof wall intersections.
 - 1. Use polymer modified asphalt reinforced ice and water barrier with a fiberglass mat and self-adhesive backing for bonding to roof deck substrate.
- D. WATER DIVERTER: at doors shall be used where practical.

EXECUTION

- A. ASPHALT SHINGLE ROOFING: shall be installed along with underlayment according to the recommendations of shingle manufacturer and details and

recommendations of NRCA Steep Roofing Manual. Install valleys using closed woven valley.

- B. ROOFING FELT: shall be installed as noted above.
 - 1. Lap felt 6 in. over top edge of ice and water barrier.
- C. SNOW GUARDS: shall be installed at roof eaves over entrances and walkways.
 - 1. Snow guards shall not penetrate shingles.
- D. DRAINAGE: All shingle roof areas shall drain into external gutters and downspouts.
- E. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period.
 - 1. Material Warranty Period: 40 years from date of Substantial Completion, prorated, with first 5 years nonprorated.
 - 2. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.

END OF 07 31 13



SPECIFICATION STANDARDS

07 50 00 - MEMBRANE ROOFING

PRODUCTS

- A. THERMOPLASTIC OLEFIN OR POLYOLEFIN (TPO) SINGLE PLY MEMBRANE ROOFING: Shall be fully adhered type. Minimum thickness of the membrane shall be as required by manufacturer to achieve warranty, but no less than 60 mil. The complete roofing system including membrane, insulation and attachments shall meet requirements of N.C. State Building Code (including ASCE-7 for wind uplift) and UL Class A. Color shall be white.
- B. MODIFIED BITUMEN ROOFING
1. Cold adhesive or torch applied is the preferred systems for modified bitumen roofing.
 2. Hot asphalt applied is acceptable with the special consent of the Owner, prior to the start of the Design development Phase.
 3. Modified bitumen roofing shall be a minimum of two plies and shall have factory-applied surfacing.
 4. Modifiers and reinforcements shall be as recommended by the Design Consultant, however no organic products shall be specified.
 5. The complete roofing system including membrane, insulation and attachments shall meet the requirements of N.C. State Building Code (including ASCE-7 for wind uplift) and UL Class A. Acceptable manufacturers include:
 - a. Siplast, Inc.
 - b. Soprema
 - c. GAF
 - d. Performance
 - e. Johns Manville
- C. BUILT UP ROOFING: is acceptable with the special consent of the Owner, prior to the start of the Design Development Phase.
1. A minimum of four plies of type VI fiberglass roof felts embedded in steep asphalt.
 2. Surfacing shall be ASTM D 1863 gravel embedded in asphalt.
 3. The complete roofing system including membrane, insulation and attachments shall meet requirements of FM I-90 and Class 1A and UL Class A. Acceptable manufacturers include:
 - a. Johns Manville
 - b. GAF
 - c. Firestone
- D. ROOF INSULATION
1. Provide insulation thickness as required to meet specified thermal resistance.
 2. Type of insulation must be approved for use by membrane manufacturer and also meet requirements of the N.C. State Building Code (including ASCE-7 for wind uplift) and UL designs.

- E. FLASHING
 - 1. Base flashing shall be type recommended by membrane manufacturer to meet warranty requirements.
 - 2. CCS prefers the use of foil clad modified bitumen base flashings for modified bitumen and built-up roof systems.
- F. FUME REDUCTION EQUIPMENT
 - 1. Fume reduction equipment shall be used with every asphalt kettle.

EXECUTION

- A. MEMBRANE ROOFING
 - 1. Install entire roof system according to recommendations of membrane manufacturer and requirements of the above noted design requirements.
 - 2. Roof drain grates shall be cast iron and anchored.
 - 3. All (cold adhesive applied) modified bitumen membrane laps shall be heat welded at the end of each work day.
- B. SAFETY
 - 1. Provide provisions in the specifications for safety items such as: fire extinguishers, torch requirements, fire safety precautions, and fire watch.
- C. Warranty: See Section 01 77 00 for warranty information.

END OF 07 50 00



SPECIFICATION STANDARDS

07 56 00 - FLUID-APPLIED ROOFING

GENERAL

Use of fluid applied roofing will be used for restoring existing roofing systems only with Owner's written permission.

PRODUCTS

- A. FLUID APPLIED ROOFING
 - 1. Shall be an acrylic type roof coating bearing ASTM D-6083, Liquid Applied Elastomeric Acrylic Coating Used in Roofing and UL Class A Fire Rated material.
- B. Acceptable Manufacturers include:
 - 1. Sunlife Roofing Systems
 - 2. Topcoat
 - 3. SR Products
 - 4. Republic Powdered Metals, Inc.
- C. Other fluid applied roof systems shall be reviewed by the RRC and CCS, and if accepted, shall be included.

EXECUTION

- A. FLUID APPLIED ROOFING
 - 1. Shall be installed by manufacturer authorized roof contractors according to the recommendations of the manufacturer.
 - 2. Repair existing roof system to maintain a watertight condition.
 - a. Clean and prepare existing roof system per manufacturer's requirements.
- B. SINGLE PLY SYSTEMS
 - 1. Prepare all existing seams with application of roof coating, polyester fabric and a second application of roof coating, allow to thoroughly dry.
 - 2. Apply base coat at a minimum rate of 2 gallons per square or 16 mils dry film thickness, allow to thoroughly dry.
 - 3. Apply surface coat of roof coating at a minimum rate of 2 gallons per square or 16 mils dry film thickness.
 - 4. A full cloth system may be used with special consent and approval of the Owner.
- C. BUILT-UP ROOFING (smooth) SYSTEM
 - 1. Apply first coat at a minimum rate of 5 gallons per square or to accurately cover surface for fabric installation.
 - 2. Embed polyester fabric into wet material, allow to thoroughly dry.
 - 3. Apply base coat at a minimum rate of 2 gallons per square or 16 mils dry film thickness, allow to thoroughly dry.

4. Apply surface coat of roof coating at a minimum rate of 2 gallons per square or 16 mils dry film thickness.
- D. METAL ROOF SYSTEM (minimum 3:12 slope)
1. Remove all scaled rust and clean.
 2. Prime all rusted areas with an approved rust inhibitor primer.
 3. At all joints, seams and protrusions, apply a coat of rust inhibitor roof coating, polyester fabric and a second application of rust inhibitor roof coating, allow to thoroughly dry.
 4. Apply base coat at a minimum rate of 1 gallons per square or 8 mils dry film thickness, allow to thoroughly dry.
 5. Apply surface coat of roof coating at a minimum rate of 1 gallon per square or 8 mils dry film thickness.
- E. FLASHINGS:
1. All flashing and counterflashing shall receive a base coat, polyester fabric, and 2 coats roof coating for a minimum 80 mils dry film thickness.
- F. Warranty: See Section 01 77 00 for warranty information.

END OF 07 56 00



SPECIFICATION STANDARDS

07 60 00 - FLASHING AND SHEET METAL

GENERAL

Materials and details used for through-wall flashing, gravel stops, gutters and downspouts shall be permanent and require low maintenance.

PRODUCTS

- A. CONCEALED THRU-WALL MASONRY FLASHING
 - 1. 3 oz. /sq. ft. copper bonded with asphalt to waterproofed Kraft paper masonry flashing shall be used. (See Section 04 20 00).
- B. EXPOSED THRU-WALL FLASHING
 - 1. 16 oz. copper; 28 gauge stainless steel; 20 gauge aluminum with anodized or paint "grip" finish; 26 gauge galvanized steel with Kynar 500 coating and self-adhesive and self-sealing EPDM roof flashing are recommended for use.
- C. CAP FLASHING, PARAPET CAPS, DRIP EDGES, and GUTTERS AND DOWNSPOUTS
 - 1. Same materials as recommended above for exposed through-wall flashing.
 - 2. At sheet metal roof installations, it is recommended material and finish of gutters and downspouts match roof panels.
 - 3. Provide solid metal gutter guards.

EXECUTION

Downspouts shall be protected with heavy-duty covers (24gauge minimum) or be schedule 10 steel or schedule 40 PVC with 16 gauge metal cover between finished grade and two feet (2'-0") minimum above finished grade.

Covers or pipes shall be painted to match adjacent surface.

END OF 07 60 00



SPECIFICATION STANDARDS

07 61 00 - SHEET METAL ROOFING

GENERAL

Provide roof tie-off hooks as required by OSHA. Reference current edition of the North Carolina Occupational Safety and Health Standards for the Construction Industry, Section 1926.500.

Prime and paint to match metal roof color.

PRODUCTS

- A. SHEET METAL ROOFING shall be a pre-fabricated, pre-finished metal panel roofing system.
 - 1. The system shall include the metal panels, sliding clips and other attachments and flashing to adjacent construction and other accessories.
 - 2. The system shall be a double folded mechanically screwed system.
 - 3. The complete systems shall meet the requirements of N.C. State building Code (including ASCE-7 for wind uplift) and UL Class A.
 - 4. The complete system installation (including all penetration flashings, eaves, ridge, hips, and valleys) shall be warranted by the manufacturer for the full warranty term of 20 years (20-year weathertight and 20 year finish).
 - 5. Finish of all roofing panels, trim and accessory elements shall be shop-applied, Kynar 500, Versacor PF or Fluruthane IV coating.
 - 6. Any exposed fasteners shall be minimal and of stainless steel construction and shall match color of roofing by means of factory-applied coating.

- B. Acceptable manufacturers include:
 - 1. Metal Sales Corporation
 - 2. MBCI
 - 3. AEP-SPAN
 - 4. McElroy Metal
 - 5. Designer Metals Systems
 - 6. Other materials and types of metal panel roof systems shall be reviewed by the RRC and CCS, and if accepted, shall be included.

EXECUTION

- A. SHEET METAL ROOFING shall be installed by manufacturer authorized installers according to the recommendations of the manufacturer and the requirements of the above noted design requirements.

1. It is recommended that the roof panels be installed on 30 lb. asphalt felt or rubberized modified asphalt over a solid substrate.
 2. Provide rosin sized sheathing paper under asphalt felt where recommended by manufacturer or SMACNA.
- B. SNOW GUARDS shall be installed at roof eaves.
1. Provide snow guards that attach to the metal roof panel seams.
 2. Snow guards shall not penetrate or be adhered to metal roof panels.
 3. Snow guard systems shall have attachments to catch and/or block ice from the roof panels.
- C. WARRANTY: Refer to section 01 77 00 for warranty requirements.

END OF 07 61 00



SPECIFICATION STANDARDS

08 10 00 - WOOD DOORS

GENERAL

Structural Composite Lumber (SCL) core wood doors with transparent finish in hollow metal frames shall be used at most interior doors including 20 minute constructed fire doors.

Wood "B" labeled doors may be used only with Owner's written approval.

Doors shall be pre-fitted, pre-finished and pre-machined at factory for finish hardware. No custom sizes are to be used.

High-density mineral core blocking reinforcement for mineral core doors shall be provided at hinge, closer, lock and strike locations.

PRODUCTS

- A. WOOD DOORS shall be solid core doors complying with requirements of WDMA 1A and Section 1300 and 1500 of AWI "Designer Architectural Woodwork Quality Standards".
 - 1. Fire-rated doors shall have solid core as required to meet rating requirements.
 - 2. With approval in writing by Owner labeled wood doors over 20 minutes requiring flush bolts, surface bolts, and exit devices, are to receive proper blocking for attachment of hardware.
 - 3. At high traffic doorways in Middle and High Schools, use metal doors.
- B. All doors shall be 5 or 7-ply hot pressed (cold pressed will not be acceptable) bonded core.
- C. INTERIOR WOOD DOORS WITH TRANSPARENT FINISH: shall be AWI custom grade ("A" Grade Veneer) with hardwood veneer face, pre-finished at factory utilizing AWI System TR6 finishes.
 - 1. Rotary cut doors are also acceptable but must first be approved in writing by the District.
- D. Specify doors, which do not use formaldehyde based glue in the manufacturing process.
- E. Only domestic species of wood should be used.
- F. Two coat hooks shall be installed by contractor on the back of all office doors in new schools and renovated spaces.
- G. LOUVERS shall be metal, sight-proof louvers constructed of 24 gauge steel V or Y shaped blades in 20 gauge frame.

H. VISION LIGHTS

1. All doors at instructional areas shall have vision lights.
2. Glaze with ¼ in. UL labeled fire rated glazing products at fire rated doors and 1/4 in. tempered glass at other doors.
3. Light size shall be 3 in. x 33 in. at fire rated doors and 6 in. x 33 in. at other doors.
4. Locate light 10 in. from strike side of door and bottom of light 3-4 ft. above finish floor.
5. Glazing kits shall be (concealed type) flush with door surface.

EXECUTION

A. WOOD DOORS

1. Do not hang doors until the building is enclosed, the permanent heating and cooling systems are in operation and residual moisture from plaster, concrete, masonry or terrazzo work has dissipated.

B. DELIVERY, STORAGE AND HANDLING

1. No doors shall be delivered to the building until weatherproof storage space is available.
2. Store doors in a space having controlled temperature and humidity range between 30 and 60 percent (conditioned air).
3. Stack doors flat and off the floor, supported to prevent warpage.
4. Protect doors from damage and direct exposure to sunlight.
5. Do not walk or place other material on top of stacked doors.
6. Do not drag doors across one another.
7. Contractor shall use all means necessary to protect doors from damage prior to, during, and after installation.
8. All damaged doors shall be repaired or replaced by the contractor at no cost to the owner.
9. Factory finished doors shall be individually wrapped in ploybags to protect the finish from damage by contact with other doors.
10. Doors shall be palletized at factory in stacks of no more than 30 doors per pallet.
11. Door edges shall be protected with heavy corner guards.

C. WARRANTY:

1. All work in this Section shall be warranted by a FULL DOOR WARRANTY for 10 years (from the date of installation) against defect in materials and workmanship, including the following:
 - a. Delamination in any degree.
 - b. Warp or twist of 1/4 inch or more in any 3'6" x 7'0" section of a door.
 - c. Telegraphing of any part of core assembly through face to cause surface variation of 1/100 inch or more in a 3 inch span.
 - d. Any defect which may, in any way, impair or affect performance of the door for the purpose, which it is intended. Replacement under this warranty shall include hanging, installation of hardware, and finishing.

END OF 08 10 00



SPECIFICATION STANDARDS

08 11 13 - HOLLOW METAL INTERIOR DOORS AND FRAMES

GENERAL

- A. Heavy-duty hollow metal door and frames are required for school usage especially at high traffic areas.
- B. Each fire rated frame and door shall bear applied label of Underwriters Laboratories (UL), Warnock Hersey International (WHI), or other approved independent testing laboratory and inspection service. Approvals shall not be stamped directly into metal frames or doors.
- C. Do not use custom sizes for doors or frames.

PRODUCTS

- A. Exterior hollow metal doors and frames are not to be used on the exterior of the building except with specific written approval from the owner.
 - 1. Only with approval in writing by the Owner can hollow metal be used on the exterior and when used it shall be SDI Grade III, extra heavy model 2A (seamless) that requires face sheets of 16 gauge minimum.
 - 2. Exterior doors and frames shall be of galvanized steel construction including reinforcement, louvers and other accessories.
 - 3. Top of exterior doors shall be closed flush and welded watertight.
 - 4. Frames shall be fabricated from 14 gauge cold rolled steel.
- B. Interior hollow metal doors and frames shall be SDI Grade III, extra heavy duty, welded Model 2 (seamless) that requires face sheets of 16 gauge minimums. Interior frames shall be fabricated from 16 gauge cold rolled steel.
- C. Hollow metal glazing frames shall be fabricated from 14 gauge cold rolled steel.
 - 1. Where used on the exterior both frame and glazing stops shall be made from galvanized sheet metal and glazing stops shall be prime coated prior to assembly.
- D. Frame Anchorage
 - 1. Jamb anchors at masonry wall openings shall be standard wire anchors.
 - 2. Frames at masonry walls shall be filled with grout.
 - 3. Jamb anchors for plaster and gypsum wallboard partition openings shall be a minimum of 12 gauge steel.
 - 4. Provide floor anchors at all frames.

- E. Finish Hardware Reinforcement
 - 1. Door reinforcement shall be a minimum of 12 gauge for hinges and be a continuous channel for the full height of door, 12 gauge for closers and be a continuous channel for the full length of the header with 14 gauge for strikes and a continuous channel for the full height of the door.
 - 2. 7 gauge reinforcements shall be used for hinges on frames.
 - 3. 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.

- F. Vision Lights shall be provided at stairs/corridor doors, except at 3 hour labeled openings.
 - 1. Glaze with 1/4 in. UL labeled firelight or approved equal at fire rated doors and 1/4 in. tempered glass at other doors.
 - 2. Light size shall be 3 in. x 33 in. at fire-rated doors with light located 10 in. from strike side of door and bottom of light 3 foot 4 inches above finish floor.
 - 3. Glazing kits shall be (concealed type) flush with door surface.

- G. Louvers shall be sightproof louvers constructed of 24 gauge steel V or Y shaped blades set in 20 gauge frame.
 - 1. A galvanized wire mesh 1/2 in. x 1/2 in. screen shall be provided at the inside face of exterior door louvers.
 - 2. Louvers are discouraged from being used on doors that are designed to be secured.

- H. Finish Preparation:
 - 1. The exposed surfaces of door and frame units including galvanized surfaces shall be cleaned; bonderized and shop primed using manufacturer's standard baked-on rust inhibitive primer.

EXECUTION

- A. DOOR AND FRAME LAYOUT
 - 1. Frames shall be installed in compliance with DHI pamphlet "The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware".
 - 2. Particular attention shall be paid to Squareness, Plumbness and Spreaders. Caution: Angle iron braces shipped with frames at bottom does not qualify as a "spreader".

- B. DOOR AND FRAME STORAGE
 - 1. Contractor shall store doors and frames properly at job site off ground and protected from moisture.

- C. Warranty: See Section 01 77 00 for warranty information.

END OF 08 11 13



SPECIFICATION STANDARDS

08 30 00 - SPECIAL DOORS

GENERAL

All overhead doors and grilles shall be of metal construction.

PRODUCTS

- A. **ACOUSTICAL DOORS AND WINDOW ASSEMBLIES**
 - 1. Where acoustical doors or windows are used they shall be manufactured by a company that specializes in manufacturing high performance STC (Sound Transmission Class) rated doors and windows.
 - 2. Do not use standard hollow metal or wood doors where STC ratings are required.

- B. **Acceptable manufacturers:**
 - 1. Krieger Steel Products Company
 - 2. Overly Manufacturing

END OF 08 30 00



SPECIFICATION STANDARDS

08 41 00 - ENTRANCES AND STOREFRONTS

GENERAL

Standard Aluminum entrance systems shall be used.

PRODUCTS

- A. All exterior openings shall be Aluminum Doors with Aluminum frames (including sidelights and panels) and shall meet the following minimum design guidelines:
 - 1. Anodized surfaces; as specified. Special painted finishes as specified.
 - 2. Hardware for these doors will be supplied by the hardware supplier and provided to the storefront manufacturer.

- B. Acceptable manufacturers:
 - 1. Efco Corporation
 - 2. Kawneer
 - 3. United States Aluminum
 - 4. YKK
 - 5. Vistawall

EXECUTION

Comply with manufacturer's recommendations and specifications for the installation of the doors and frames.

Warranty

Provide a written warranty signed by manufacturer agreeing to replace at no cost to the Owner, any doors, frames, hardware, or factory hardware installation which fail in materials or workmanship, within the warranty period. Failure of materials or workmanship includes: excessive deflection; faulty operation of entrances; deterioration of finish, or construction, in excess of normal weathering; and defects in hardware installation. System manufacturer will guarantee THE ENTIRE SYSTEM for a period of 10 years.

END OF 08 41 00



SPECIFICATION STANDARDS

08 51 13 - METAL WINDOWS

GENERAL

Exterior window and window-wall construction shall be insulating glass in aluminum frames with the exception of sidelights and transoms adjacent to entrance doors where hollow metal frames may be used.

Vandal resistant systems shall be used.

PRODUCTS

A. WINDOWS

1. Shall be commercial grade type fabricated from aluminum extrusions of not less than 0.062 inch thickness for main frame and sash thickness.
2. Thermal break construction shall be used.
3. Use aluminum, non-magnetic stainless steel or epoxy adhesive fasteners. Frame finish shall be natural satin anodized finish, color-anodized finish or fluoropolymer Kynar 500 color coating.
4. Finish of flashing, trim and exposed fasteners shall match frame finish.

B. STOOLS

1. A non-absorbent, easily cleanable surface shall be provided at windowsills.
2. Slate and polymer stools are acceptable.
3. Wood, plastic laminate, metal and concrete masonry unit stools shall not be used without prior approval from Owner.

C. Acceptable manufacturers:

- a. Efco Corporation
- b. Traco
- c. Graham Designer Products

EXECUTION

A. WINDOWS

1. Use interior glazing stops.
2. Install according to manufacturer's recommendations.

B. Warranty: See Section 01 77 00 for warranty information.

END OF 08 51 13



SPECIFICATION STANDARDS

08 71 00 - DOOR HARDWARE

GENERAL

Work under this section comprises furnishing and installing hardware specified for a complete and operational system, including any electrified hardware components, systems, controls and hardware for aluminum entrance doors.

PRODUCTS

A. FASTENERS

1. All closers and exit devices on labeled wood doors shall be thru-bolted.

B. HINGES

1. All hinges and pivots, including single and double acting types, pocket hinges, electric hinges to be of one manufacturer as hereafter listed for continuity and consideration of warranty.
2. Unless otherwise specified provide five-knuckle, heavy-duty, button tip, full mortise template type hinges with non-rising loose pins. Provide non-removable pins for outswinging doors at secured areas or as called for in this specification.
3. Exterior & Interior Door Hinges
 - a. Provide all swinging door hinges of solid bronze or stainless steel with non-removable pins. Furnish all exterior hinges with safety studs, or as called for in this specification.
4. Interior Door Hinges
 - a. Wrought steel, polished and plated to match specified finish. Furnish three (3) hinges up to 90 inches (2,286) high and one (1) additional hinge for every 30 inches (762) or fraction thereof.
5. Hinge size: Provide the following, unless otherwise indicated, for special applications.
 - a. Doors up to and including 36 inches wide, furnish 4 ½ inch x 4 ½ inch hinges.
 - b. Doors over 36 inches wide, furnish 5 inch x 4 ½ inch hinges.
 - c. Doors over 36 inches wide, 1 ¾ inch thru 2 ¼ inch thick, use 5 inch x 5 inch hinges.
6. Where required to clear trim or permit doors to swing 180 degrees, furnish hinges of sufficient throw.
7. Provide heavy weight hinges on all doors over 36 inches (914.4) in width.
8. At labeled doors, provide steel or stainless steel, bearing-type hinges. For all doors equipped with closers provide bearing-type hinges.
9. Finishes: At hollow metal doors, hinges are to be 26D or stainless steel at exterior outswinging doors, unless otherwise required.

10. Acceptable products:

Hager	IVES
BB1279	5BB1
BB1168	5BB1HW
BB1191	5BB1
BB1199	5BB1HW

C. LOCKS AND LOCK TRIM

1. All locksets, latchsets, electrified locksets and trim to be of one manufacturer as hereafter listed for continuity of design and consideration of warranty; electrified locksets to be the same series and design as mechanical locksets.
2. Provide metal wrought box strike boxes and curved lip strikes with proper lip length to protect trim of the frame, but not to project more than 1/8 inch (3.2) beyond frame trim or the inactive leaf of a pair of doors.
3. Mechanical mortise Locks to meet ANSI A156.13 Operational Grade 1 requirements where designated mortise locks to meet or exceed ANSI Security Grade 1 requirements.
 - a. 12 gage (2.6) steel cap and case for all functions.
 - b. Furnish 3/4 inch (19), stainless steel, 3 piece anti-friction latch bolts.
 - c. One (1) inch (25.4) stainless steel deadbolt with hardened steel roller inserts.
 - d. Hand of lock is to be easily field reversible without opening the lock body case.
 - e. All lever trim is to be thru-bolted through the door and lock case.
 - f. All cylinder collars for mortise locks to be cast.
 - g. All lever handles to be Cast or Forged.
4. All hardware functions to be exactly as listed in the individual hardware sets with no exceptions.
5. Acceptable products:

Corbin / Russwin	Schlage (Owner Preferred)
Mortise Lock: ML2200 Series	Mortise Lock: L9000 Series
LSA Cast Design	03A Forged Design
Finish: 26D	Finish: 26D
6. Classroom doors to have classroom security function (L-9071).

D. CYLINDERS AND KEYING:

1. Furnish all locks and cylinders keyed to the new Schlage Everest D Patented Grandmaster key system, as directed by Cabarrus County Schools.
2. Cabarrus County School's Maintenance Department may be reached at 336-370-2386 for a Copy of Cabarrus County's Hardware and Keying Guide. Medeco Cylinders, Owner preferred. Equip locks with cylinders featuring patented, restricted keys and auxiliary locking pin. Construction master key feature permits voiding of construction keying without cylinder removal on interior doors. Exterior cylinders will be equipped with temporary Construction Cores
3. All keying to be accomplished at the factory of the lock manufacturer.

4. Each cylinder or lock to be supplied with additional change keys. Number of change keys to be determined by Cabarrus County School's Hardware group. Provide interchangeable cores for each interior and exterior lock set.
5. One (1) masterkey to be supplied for each master keyed group. Where applicable each school will have five sub-master zones.
6. DO NOT supply any Grand Master Keys for any project.
7. All cylinders and keys shall be stamped alike and properly tagged to indicate their intended location and to enable the Owner, with a minimum of effort, to establish the key control system.
8. Furnish all locks and cylinders construction master keyed. Provide control keys for construction core and permanent cores.
9. Ten (10) construction masterkeys to be supplied for the project. Furnish Two (2) Construction Control Keys and two Permanent Control Keys.
10. Stamp all change keys with keyset symbol (VKC), stamp with key section or biting number Stamp " DO NOT DUPLICATE ".
11. Furnish one (1) each key cabinet similar to model AWC as manufactured by Telkee with a capacity of one (1) hook per door plus an additional 50 percent expansion. Other acceptable manufacturers Lund and P.O. Moore. Furnish similar key cabinet with Hasp & Staple + Master Padlock # 0300 for Maintenance Staff use.
12. The Hardware Supplier shall receive all Keys and set up all Key boxes including but is not limited to the tagging of each individual key at the Direction of the Owner and deliver boxes when Directed by Owner to a location specified. Contractor to install key box(s) at locations directed by Owner.
13. Furnish two (2) #3300 RMK Knox box Keyed to Cabarrus County Fire Dept System: One adjacent to Main Front Entry, the other to Kitchen door.
14. The distributor shall furnish owner with a final bidding list on all projects. Bidding list will be coordinated with actual door schedule as shown on architect's drawings.
15. All Kitchen Food Service shall have its own key with food storage and not be master keyed.
16. Mechanical/Electrical room doors will be keyed alike to a separate key.
17. Cabarrus County Schools must approve all keying before cylinders & locks are ordered.

E. EXIT DEVICES:

1. All exit devices and trim, including electrified items, to be of one manufacturer as hereafter listed and in the hardware sets for continuity of design and consideration of warranty; electrified devices and trim to be the same series and design as mechanical devices and trim.
2. Exit Devices to be "UL" listed for life safety. All exit devices for labeled doors shall have "UL" label for "Fire Exit Hardware". All devices mounted on labeled wood doors are to be thru-bolted or per the manufacturer's listing requirements. All devices to conform to NFPA 80 and NFPA 101 requirements.
3. Exit devices shall comply with ANSI Standard 156.3 Grade 1. All exit devices to be heavy duty, with one piece removable covers. The housing

shall be manufactured from extruded aluminum with no exposed screws or rivets.

4. The devices shall be "touchpad" (modern) type. The touchpad which shall extend a minimum of 1/2 of the door width, and have hydraulic silencing of touchpad. All metal end caps to be standard with all exit devices
 5. All device latchbolts shall be molly coated and where used in wide stile rim or vertical rod devices shall have external deadlocking standard.
 6. Device strikes where surface applied shall be roller type and have anti-slip mounting plate. All outside device trim shall be forged brass full escutcheon. Lever trim shall be "breakaway type" with substantial resistance to rotation when locked but allowing vandalized lever to drop to vertical position when 35 ft. lbs. is applied. Returning lever to horizontal position will allow trim to be operational again.
 7. Vertical rod devices shall not be used for latching.
 8. Device shall be secured to the door with sex bolts and through bolting at both ends. Device end cap shall be all metal and secured with three screws to truss bracket.
 9. Push pad exit devices shall be patterned punched to designate code requirements where required.
 10. Where required, Controlled Exit Devices shall be UL listed "Controlled Exit Panic Device" for use on accident hazard or fire exit applications. Devices shall include in the device housing the following features: Request to exit switch, nuisance alarm, remote alarm, relay, key switch, indicator lamp, internal horn, door position input, external inhibit input, fire alarm input and internal auxiliary lock. Device shall meet all requirements for NFPA 101, Special Locking Arrangement.
 11. Mullions shall be "keyed removable" type with only a key required for take down. No key or tools shall be required to reinstall. Mullions shall be by the same manufacturer as the exit devices.
 12. All exit devices are to be by the same manufacturer. No deviations will be considered.
 13. Devices shall have published three-year warranty.
 14. Finish: 26D
 15. Acceptable products: Von Duprin Exit Devices. Owner Preferred Alternate – Von Duprin 98 SE Series.
 16. Key cylinder dogging, not hex key dogging.
 17. Exterior metal doors shall have a Don Jo pull.
- F. SURFACE MOUNTED & CONCEALED DOOR CLOSERS:
1. All closers for this project to be the product of a single manufacturer for continuity of design and consideration of warranty.
 2. All Closers shall have a Ten (10) year warranty and tested by independent testing laboratory for 10,000,000 cycles.
 3. All closers to be heavy-duty surface and concealed mounted, hydraulic type, high strength Cast iron body with steel piston and full rack and pinion construction.
 - a. Be handed and sized at factory to insure proper installation.
 - b. Floor closers for heavy traffic areas should be considered by Designer where possible.

4. Closers shall have non-changing hydraulic fluid for temperature range of 120 degrees to -30 degrees F, equal to LCN Liquid "X" fluid meeting UL 10C non-flammable liquid.
5. All closers to have tamper resistant, non-critical regulating screw valves for closing speed, latching speed and backcheck control as a standard feature.
6. All closer covers to be rectangular, full cover type of MC-ferrous, non-corrosive material painted to match closer.
7. Arms shall be Solid forged with extra duty knuckled construction, threaded, stamped, or "formbreak" arms will not be acceptable. Furnish security tract type closers as listed in schedule.
8. Supply appropriate arm assembly for each closer so that closer body and arm are mounted on non-public side of door opening and on the interior side of exterior openings, except where required otherwise in the hardware sets.
9. Provide closers with special application and heavy-duty arms as specified in the hardware sets or as otherwise called for to insure a proper operating, long-lasting opening.
10. Where "stop" is part of arm bracket, use "spring cush" arm mounted at maximum possible swing.
11. Finish: Sprayed electro static finish to match other hardware
12. Acceptable Products:
 - a. LCN (Owner Preferred)
 - b. Corbin

G. DOOR STOPS AND HOLDERS:

1. Door stops are to be furnished for every door leaf. Every door to have a floor, wall, or an overhead stop. Special arms on door closers do not constitute door stops.
2. Place door stops in such a position that they permit maximum door swing, but do not present a hazard or obstruction. Furnish floor strikes for floor holders of proper height to engage holders of doors.
3. Where Overhead Stops and Holders are specified, or otherwise required for proper door operation, they are to be heavy duty.
 - a. Units shall have metal/plated end plugs. No plastic end plugs will be accepted.
 - b. Units shall be field convertible from stop to holder by kits.
 - c. Units shall have metal slide. No plastic slides will be acceptable.
 - d. All stops shall be by same manufacturer.
 - e. Finish: 32D
 - f. Acceptable O.H. stops/holders: GJ # 90 Series and 100 Series
4. Furnish floor and wall stops as listed in hardware sets. Acceptable manufacturers:
 - a. Glynn-Johnson (GJ)
 - b. Ives
 - c. Trimco

- H. **PUSH PLATES, DOOR PULLS, AND KICKPLATES:**
1. All push plates, door pulls, kickplates and other miscellaneous hardware as listed in hardware sets. Acceptable manufacturers:
 - a. Glynn-Johnson (GJ)
 - b. Ives
 - c. Trimco
 2. Kickplates to be 8 inches high and Mop plates to be 4 inches High, both by 2 inches or 1 inch less than door width (LDW) as specified. They are to be of 16 Gauge 0.050 inches thick bronze, brass, or stainless steel. For doors with louvers or narrow bottom rails, kickplate height to be 1 inch less than the dimension shown from the bottom of the door to the bottom of the louver or glass.
 3. Where required armor plates, edge guards and other protective hardware are to be supplied in sizes as scheduled in the hardware sets.
 4. Finish: Same as other hardware, except use 32D and 32 (stainless steel) in lieu of 26D and 26 (plated chrome finishes), respectively, where available.
- I. **FLUSH BOLTS AND COORDINATORS:**
1. Provide Flush bolts with Dust Proof Strikes as indicated in the individual hardware sets by Glynn-Johnson (GJ), Ives or Trimco.
 2. Finish to match adjacent hardware.
- J. **THRESHOLDS AND GASKETING:**
1. Provide materials and finishes as listed in hardware sets.
 2. Products by National Guard Products. Reese, and Pemko are acceptable.
 3. All thresholds must be in accordance with the requirements of the ADA and ANSI A117.1.
 4. Provide threshold with machine screws and lead anchors.
 5. Supply all necessary anchoring devices for weather-strip and sound seal.
- K. **DOOR SILENCERS:**
1. Furnish door silencers at all openings without gasketing.
 2. Provide 2 at each pair of doors and 3 for each single door.
 3. Provide sound deadening stripping around all doors at all Band rooms, Choral rooms and practice rooms.

EXECUTION

- A. Hardware supplier to be a qualified direct distributor of the products to be furnished. In addition, the supplier to have in their regular employment an A.H.C. or person of equivalent experience who will be made available at reasonable times to consult with the Designer regarding any matters affecting the finish hardware on the project.
- B. The Hardware Supplier SHALL INSTALL all Finish Hardware using a factory trained and approved Installer fully familiar with and capable of correctly all

Finish Hardware, Functions, Key System etc: for acceptance by the Owner. The General Contractor SHALL NOT INSTALL any Finish Hardware.

- C. There shall be a Pre and Post Installation Meeting and Inspection by the Owner and Factory Representative to insure Hardware is correctly installed and adjusted.
- D. All hardware used in labeled fire or smoke rated openings to be listed for those types of openings and bear the identifying label or mark indicating U.L. (Underwriter's Laboratories) approved for fire. Exit devices in non-labeled openings to be listed for panic.
- E. Pre-Installation Conference for Electronic Hardware: Prior to installation of electronic hardware, arrange conference between supplier, installers and related trades to review materials, procedures and coordinating related work.
- F. Hardware to be installed by experienced finish hardware installers only.
- G. Install finish hardware in accordance with approved hardware schedule and manufacturers printed instructions.
- H. Mortise and cutting to be done neatly, and evidence of cutting to be concealed in the finished work.
- I. Protect all finish hardware from scratching or other damage.
- J. DOOR HARDWARE SUPPLIER'S FIELD SERVICE:
 - 1. Inspect door hardware items for correct installation and adjust after complete installation of door hardware.
 - 2. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
 - 3. File written report of this inspection to Designer.
- K. Prior to project completion, representatives of the lock, exit device, and overhead door closer manufacturers shall inspect and adjust all units and certify that all units are installed in accordance with the manufacturer's instructions, and are regulated properly and functioning correctly. A written report shall be provided to the Designer as to the inspection and shall include appropriate certificates.
- L. WARRANTY
 - 1. All finish hardware shall be supplied with a one (1) year warranty against defects in materials and workmanship, commencing with substantial completion of the project except door position switches in concealed closers to have a two (2) year warranty and all door closers to have a ten (10) year warranty.

END OF 08 71 00



SPECIFICATION STANDARDS

08 80 00 - GLAZING

GENERAL

- A. This Section includes:
 - 1. Float glass.
 - 2. Clear tempered glass.
 - 3. Laminated glass.
 - 4. Coated glass.
 - 5. Insulating glass units.

QUALITY ASSURANCE

- A. Standards: Comply with applicable provisions and recommendations of:
 - 1. GANA Publications: GANA's "Laminated Glazing Reference Manual" and GANA's "Glazing Manual."
 - 2. AAMA Publications: AAMA GDSG-1, "Glass SPECIFICATION for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
 - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
 - 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
 - 5. CPSC "Safety Standard for Architectural Glazing Materials" (16 CFR 1201).
 - 6. FS DD-G-451, prime glass standard.
- B. Manufacturer's Qualifications: Provide glazing systems produced by a single manufacturer with not less than 5 years successful experience in the fabrication of assemblies of the type and quality required.
- C. Installer's Qualifications: Interior glazed systems shall be installed by a firm that has not less than 5-years successful experience in the installation of systems similar to those required.

PRODUCTS

MANUFACTURERS

- A. Glazing Manufacturers and Fabricators: Subject to compliance with requirements, firms producing glass products which may be incorporated into the work include the following:
 - 1. AFG Industries, Inc.
 - 2. Bendheim Glass.
 - 3. Corning Incorporated.
 - 4. Guardian Industries Corp.
 - 5. J.E. Berkowitz, LP.

6. LOF Glass, Inc.
 7. McGrory Glass, Inc.
 8. Pilkington North America.
 9. PPG Industries, Inc.
 10. Viracon, Inc.
- B. Fire-Rated Glazing Manufacturers: Subject to compliance with requirements, firms producing fire-rated glazing products which may be incorporated into the work include the following:
1. Technical Glass Products, Inc.
 2. Nippon Electric Glass Co., Ltd. (distributed by Technical Glass Products).
 3. Safti First.
 4. Schott North America, Inc.
 5. Vetrotech Saint-Gobain.

GLASS

- A. Primary Glass Standard: Provide primary glass which complies with ASTM C 1036 requirements for type, class and quality.
- B. Heat-Treated Glass Standard: Provide heat-treated glass which complies with ASTM C 1048 requirements. Surface compression of heat strengthened glass shall be in the range of 3500 to 6500 psi.
1. Provide heat treated glass where glass would be vulnerable to thermal breakage and where required for safety of persons.
 2. Provide fully tempered or heat strengthened glass where indicated or required by authorities having jurisdiction.
 3. Tempered glass shall comply with ANSI Z97.1.
- C. Ultraclear Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I, complying with other requirements specified and with visible light transmission not less than 91 percent and solar heat gain coefficient not less than 0.87.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. AFG Industries, Inc.; Krystal Klear.
 - b. Guardian Industries Corp.; Ultrawhite.
 - c. Pilkington North America; Optiwhite.
 - d. PPG Industries, Inc.; Starphire.
- D. Low-Emittance Coated Vision Glass: ASTM C 1376, coated by vacuum deposition (sputter-coating) process, and complying with other requirements specified.
- E. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units.
1. U-Factor: 0.60 Btu/sq. ft. x h x deg F (3.4 W/sq. m x K) or less.
 2. Solar Heat-Gain Coefficient (SHGC): Provide aluminum windows with a whole-window SHGC maximum of 0.30, determined according to NFRC 200 procedures.
- F. Fire Rated Glass: Permanently label each piece of glazing with the appropriate marking for rating.

Warranty:

- A. General: Submit warranties signed by the respective manufacturers agreeing to repair or replace defective materials or workmanship within the specified warranty periods, starting from the date of substantial completion.
 - 1. Laminated Glass: Submit a five (5) year warranty against defects of each of the laminated glass types specified, from manufacturer.
 - a. Defects include but are not limited to delaminations, visual separations of the interlayer, bubbles, defects and other imperfections.
 - 2. Insulating Glass Units: Submit a ten (10) year warranty against defects of each of the insulating glass unit types specified, from manufacturer.
 - a. Defects include but are not limited to loss of seal, interior clouding, discoloration, and other imperfections.

END OF 08 80 00



SPECIFICATION STANDARDS

09 29 00 - GYPSUM WALLBOARD

GENERAL

- A. GYPSUM BOARD STANDARD
 - 1. Comply with applicable requirements of ANSI/ASTM C 840 for application and finishing of gypsum board, unless otherwise indicated.
 - 2. For gypsum board and related adhesives, submit printed statement indicating that product meets the product and testing requirements of the California Department of Health Services *Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers*, with 2004 amendments.
- B. Principals', Assistant Principals', Student Support Services' offices, walls between classrooms, and all conference rooms shall be constructed to minimize sound transmission.

PRODUCTS

- A. GYPSUM BOARD
 - 1. Provide gypsum board of types indicated in maximum lengths available to minimize end joints.
- B. Moisture resistant gypsum board is to be used behind all walls to be tiled.

EXECUTION

- A. PRECAUTIONS
 - 1. In cold weather and during gypsum wallboard joint finishing, maintain temperature within the range of 55 to 70 deg. F.
 - 2. Adequate ventilation shall be provided to carry off excess moisture.
- B. GYPSUM BOARD INSTALLATION
 - 1. Install and finish gypsum board to comply with ASTM C 840.
 - 2. Walls shall have a level 4 finish with primer and egg shell paint.
 - 3. Gypsum wallboard to be installed such that the bottom of the board is 1/16 inch above the finish concrete floor slab.

END OF 09 29 00



SPECIFICATION STANDARDS

09 30 00 - TILE WORK

GENERAL

A. STANDARDS

1. Comply with ANSI A13.1 Standard Specification for Ceramic Tile and ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile".

PRODUCTS

A. GROUT

1. For quarry tile flooring, dark color grout is required. The grout for wall tile should coordinate with the colors of the tile. Epoxy grout for floor tile is to be used in toilet areas.

B. MARBLE THRESHOLDS

1. Shall be provided at doorways of toilet rooms.

C. QUARRY TILE

1. Flashed color ranges are recommended. A medium color such as Putty or Sand is preferred over darker colors such as Red or Brick. Slip resistance is of utmost importance in cafeteria kitchens and designers should use non-glazed tile in these areas.
2. The Owner is willing to consider any product that will provide the necessary safety while providing for easy cleaning and meeting local Health Department's approval.

D. CERAMIC WALL TILE:

1. Module size: 4 ¼ inches (108 x 108 mm).
2. Thickness: 5/16 inch (8 mm).
3. Face: Plain with modified square edges or cushion edges.
4. Finish: Bright, opaque glaze.
5. Color: As selected from manufacturer's full range of available colors and textures.

- ##### E. Metal transition strips that are mechanically fastened to the sub-floor are required at all tile transitions to carpet except where there is a marble threshold. Glue down transition strips shall not be allowed.

EXECUTION

- A. COLD WEATHER PROTECTION
 - 1. Maintain a minimum temperature of 50 degrees F. in all spaces where tile will be installed for 7 days before beginning installation of setting bed or tile and until at least a week after setting tile.
- B. Comply with ANSI A108.1 and A108.4 through A108.10.
- C. Locate expansion, control, contraction, and isolation joints to comply with recommendations of TCA "Handbook for Ceramic Tile Installation".
- D. Quarry and ceramic floor tile installation shall be "thick set."
- E. PRECAUTIONS
 - 1. Contractor to cover tile flooring until final inspection with heavy Kraft paper or other heavy protective covering to prevent surface damage.

END OF 09 30 00



SPECIFICATION STANDARDS

09 51 13 - ACOUSTICAL PANEL CEILINGS

GENERAL

This section contains information on acoustical panel ceiling systems.

PRODUCTS

A. ACOUSTICAL PANELS

1. Provide manufacturer's standard lay-in panels, 24 in. x 24 in. grid-size panels, with white finish. Specify humidity resistant panels for all wet locations. 24 in. x 48 in. panels shall not be used. Specify washable panels in kitchen and above serving lines as required by Cabarrus County Health Department. Acoustical ceiling tiles shall have a minimum reflectance of 0.085.

B. STANDARDS

1. Acoustical Ceiling Units: ASTM E 1264.
2. Acoustical Suspension System: ASTM C 635 for materials.

C. SURFACE BURNING CHARACTERISTICS

1. 25 or less for flame spread and 50 or less for smoke developed, per ASTM E 84.

D. METAL SUSPENSION SYSTEMS

1. Provide manufacturer's standard direct-hung metal suspension systems with white finish.

E. ABUSE RESISTANT PANELS

1. Provide (along with hold down clips) at areas where damage might be expected, such as Elementary School Multi-Purpose Rooms.

F. PANELS

1. 3/4 in. thickness cane or wood fiber panels are acceptable in corridors and multi-purpose rooms. Do not use soft acoustical panels at low ceiling installations.

G. Specify 75% recycled materials in ceiling panels where possible.

H. Specify products free of formaldehyde in binders. Acceptable manufacturers:

1. Armstrong World Industries (www.armstrong.com)
2. Celotex Corporation (www.celotex.com)
3. U.S. Gypsum Corporation (www.usg.com)

EXECUTION

A. PRECAUTIONS

1. Do not install acoustical tile or panels until the building is enclosed, the permanent heating and cooling equipment is in operation and residual moisture from plaster, concrete, or terrazzo work has dissipated.

B. INSTALLATION

1. Install acoustical ceiling systems in accordance with CISCA "Ceiling Systems Handbook". Do not splice hanging wires. This installation must meet seismic requirements. Do not support fixtures or equipment such as exit lights, speakers, etc. from the ceiling system.

END OF 09 51 13



SPECIFICATION STANDARDS

09 64 00 - WOOD FLOORING

PRODUCTS

A. STAGE FLOORING

1. Manufacturer's standard straight edge, tongue and groove and end-matched solid wood flooring, 1 in. thick x 2-1/8 in. or 2-1/4 in. strips in standard random lengths. At high and middle schools use Southern Pine, C and Better Flooring, near-rift grain with flat black, exterior grade latex paint finish.

B. ATHLETIC FLOORING

1. At high and middle school gyms and auxiliary gyms at high schools, use manufacturer's standard straight edge tongue and groove end matched solid wood flooring. The strips should measure 25/32 in. thick x 2-1/4 in. wide x 2 ft. minimum length and averaging 4 ft.-6 in. long. Specify either double channeled base, plain sawn MFMA certified second and better grade, Northern Hard Maple with transparent polyurethane finish. Floor to be DIN approved.

C. TRANSPARENT POLYURETHANE FINISH

1. Shall be a polyurethane co-polymer with the following characteristics:
 - a. Solids: 42%
 - b. Volatile Contents: 58%
 - c. Carrier: De-sulferized Aliphatic solvent
 - d. Application rate: 350 - 400 square feet per gallon.

EXECUTION

A. PRECAUTIONS

1. Do not install wood flooring until the building is enclosed, the permanent heating and cooling system is in operation, and residual moisture from plaster, concrete, masonry or terrazzo has dissipated.
2. Expansion Joints shall be installed per manufacturer's recommendation.

B. PROTECTION

1. Protect completed wood flooring during remainder of construction period with heavy Kraft paper or other suitable covering, so that flooring and finish will be without damage or deterioration at time of acceptance.

C. TRANSPARENT POLYURETHANE FINISH

1. Shall be installed in the following manner:
 - a. Prepare floor
 - b. Apply one (1) coat floor seal
 - c. Paint all lines using oil base quick dry enamel (2 coats)

- d. Apply one (1) coat floor seal
- e. Cut floor w/#3 steel wool
- f. Apply one (1) coat floor seal
- g. Cut floor w/#3 steel wool
- h. Buff

D. WARRANTY

- 1. Manufacturer's Warranty for wood athletic flooring shall extend for five (5) years and cover manufacturing defects and MFMA grading certification.

END OF 09 64 00



SPECIFICATION STANDARDS

09 65 00 - RESILIENT FLOORING

GENERAL

This section includes information on resilient sheet flooring, resilient tile flooring, wall base and stair treads.

Preferred type of tile flooring is non-maintenance (no stripping or waxing) vinyl composition tile (VCT). Other acceptable types of tile flooring are Asphalt Tile, Rubber Tile, PVC free vinyl tile and a standard vinyl composition tile material.

The designer shall investigate the use of a non-waxed resilient floor tile or sheet goods for all applications in lieu of standard VCT.

Elementary stages shall be of similar products.

Acceptable types of wall base are Rubber Cove or Vinyl Cove. Installer shall use maximum lengths available to minimize joints and shall install preformed or molded corner units at 90 degree outside intersections.

Designer is encouraged to use recycled rubber products and products that help with energy savings.

For each type of product required, including adhesives, cleaning compounds, and other accessories, provide the same product by one manufacturer throughout the project and specify that all products have low VOC's and do not contain formaldehyde.

PRODUCTS

- A. Sheet Flooring
 - 1. PVC Free Resilient Flooring
 - a. Chemical Resistance
 - b. Sheet width: 72 inch (2000 mm) minimum
 - c. Total Thickness: 0.080 inch (2.0 mm) minimum
 - d. Color: Manufacturers Standard Colors
- B. Any tile specified shall be free of asbestos and 1/8 in. gage.
- C. Non-slip rubber stair treads shall be provided for all public stairs in all schools and risers at Elementary schools.
- D. Edges of each stair tread to be furnished with a contrasting safety strip meeting OSHA and ADA standards.
- E. Marking of edges of stair treads with safety tape or paint will not be acceptable. For wall base, preferred products of a minimum 20% recycled content.

- F. If not available provide vinyl and rubber from the following manufacturers, provided they comply with requirements of the contract documents and have a low VOC, will be considered acceptable:
1. Johnsonite, Inc.
 2. Roppe Corporation
 3. Allstate

EXECUTION

A manufacturer's recommended moisture test shall be performed prior to installation of resilient flooring, to verify that concrete surfaces have cured sufficiently for proper adhesive bond to be achieved between the sub floor and the resilient tile.

Ventilate areas thoroughly during and after installation prior to occupancy.

Resilient edge strips shall be used in locations shown on drawings, or where otherwise required to protect edge of resilient flooring. Install resilient edge strips securely with recommended adhesive to achieve a tightly butted joint.

When an edge strip is needed at a transition between carpet and tile flooring, it shall be specified as a metal edge strip and installed per manufacturer's specification, securing it to the sub floor using mechanical fasteners and not adhesives.

When using floor tile on a ramp within a building, a non-skid tile should be used and shall meet all handicap codes.

END OF 09 65 00



SPECIFICATION STANDARDS 09 65 66 - ATHLETIC AND SPORTS FLOORING

GENERAL

Recycled rubber resilient floor tile or sheet flooring (RT) for use in weight rooms.

Resilient sports flooring to use in Dance Studios and an alternative for Middle School gyms shall be VCT wear layer over fiberglass mesh on PVC foam.

Resilient sports flooring material in an Elementary school cafeteria/multi-purpose room requiring high sports-related activity shall be VCT wear layer over fiberglass mesh on PVC foam for a total thickness of approximately 4 mm.

PRODUCTS

Products have been selected based on their intended activity function.

Type DA flooring is an alternative to wood flooring for use in dance studios. It has similar resiliency to wood but does not require the continuing bi-annual maintenance.

Type MP flooring is suggested as an alternative to VCT in Elementary school multi-purpose rooms that receive abuse from moving tables and chairs plus receive some degree of sports activity.

EXECUTION

Type RT (4-6 mm): Non-laminated, single-ply, 100% recycled SBR (Styrene-Butadiene-Rubber) tire rubber with bright reprocessed color flecks surface material.

Type MP (4 mm): Resilient sports flooring for use as an alternative (to VCT) flooring material in an Elementary school cafeteria/multi-purpose room requiring high sports-related activity shall be 1 mm PVC outer wear layer over fiberglass mesh on PVC foam for a total thickness of approximately 4 mm.

Type (DA) (6 mm): Resilient sports flooring for use in dance studios and Middle School gyms shall be 1 mm PVC out wear layer over fiberglass mesh on PVC foam for a total thickness of 1/4-inch or 6 mm, depending on manufacturer.

WARRANTIES

Manufacturer's Wear Warranty of the resilient sports flooring shall extend for fifteen (15) years.

Installer's Warranty: Provide 2-year warranty signed jointly by the Contractor and Installer covering materials, workmanship, installation and satisfactory performance of the resilient sports flooring.

Warranty shall also certify that flooring was installed in accordance with manufacturer's instructions for floor system specified.

END OF 09 65 66



SPECIFICATION STANDARDS

09 68 00 – CARPET TILES

GENERAL

This section contains information on carpet tiles.

PRODUCTS

- A. CARPET
 - 1. Carpet tiles, hard-backed vinyl backing, textured loop pile, permanent anti-static control.
 - 2. Face Construction:
 - a. Construction: No less than 100 stitches per square inch
 - b. Gauge: No less than 12 gauge
 - c. Face Weight: No less than 17 ounces
 - d. Pile Height Av: No greater than 0.156 inches
 - e. Fiber System: Nylon continuous filament only type 6.6
 - f. Dyeing Method: Solution or Yarn dyed. (Minimum of 50% solution dyed when in yarn dyed combination)
 - 3. Backing System
 - a. Primary Tufting Substrate: Synthetic non-woven
 - b. Sealant Coat: Sealant Vinyl
 - c. Backing Type: Closed cell vinyl cushion
 - d. Backing Weight: 35.5 oz/sq yd
 - e. Backing Density: 18.5 lbs/cu ft
 - f. Backing Thickness: No less than 0.156 inch
 - g. Backing Compression Set: Max 10%
 - h. Backing Compression Deflection: Min. 7 lbs at 25%
 - i. Antimicrobial: No anti-microbial (pesticide) treatments applied in backing during Manufacturing in compliance with the Healthy School Handbook as published by the NEA
 - 4. Metal reducer strips that are mechanically fastened to the sub floor are required at all hard tile or VCT transitions to carpet except where there is a marble threshold. Glue down reducer strips shall not be allowed.

EXECUTION

A seaming diagram for carpet installation shall be submitted for approval by the Cabarrus County Schools when finishes are submitted.

The diagram shall be reviewed and signed-off by the Designer.

Moisture barrier at seams shall be measured by impact at seams @ 10 psi: No water penetrations after 10,000 impacts.

WARRANTIES

Flooring contractor shall provide a 5-year warranty for defects in materials and workmanship.

Flooring manufacturer shall provide a 20-year non-prorated warranty to cover excessive surface wear, edge ravel, zippering, backing delamination (i.e. the separation of the secondary backing from the primary backing), watermarking on any product not 100% loop construction and excessive static electricity.

All carpet and components shall be recyclable.

Carpet subcontractor shall inspect sub floor prior to installation.

PRECAUTIONS

Do not install carpet until the building is enclosed, permanent heating and cooling systems are in operation and residual moisture from plaster, concrete, or terrazzo work has dissipated.

Provide Kraft paper over carpet immediately following installation to protect from damage. Contractor to remove and dispose of protection just prior to furniture delivery.

Specifications shall require moisture test prior to installation of adhesives and reference manufacturer's recommendations regarding moisture content.

Seam sealer is required at all seams chemically welded (as per manufacturer's requirements).

No saddle or T-seams shall be allowed in doorways or high traffic areas.

Ventilate thoroughly all areas during and after installation, prior to occupancy.

Installation of carpet constitutes acceptance of the subfloor condition.

END OF 09 68 00



SPECIFICATION STANDARDS

09 84 33 - ACOUSTICAL WALL PANELS

GENERAL

This section contains information on fabric wrapped fiberglass acoustical panels and metal faced acoustical wall panels.

PRODUCTS

- A. FABRIC WRAPPED FIBERGLASS WALL PANEL PRODUCTS:
1. Products by the following manufacturers are acceptable:
 - a. Armstrong world Industries, Inc.
 - b. Purdue
 - c. L.E. Carpenter
 - d. Conwed
 - e. Wenger
 - f. Decoustics
 - g. Kinetics
 - h. Wall Technology
 - i. Acoustical Resources, Inc.
 - j. Inter-Con Specialties, Inc.
 - k. Sound Concepts Panels nominal size: as required - full length if possible. Width shall be 24".
- B. Wall Panels
1. Absorber Panels: Wall and ceiling mounted impact resistant polyhedrons; sound absorbing throughout audio spectrum; fabric wrapped. Manufacturer's standard construction of 6 lb. /cu. ft. three inch thick fiberglass board with foil backing (no exposed fiberglass), metal edged frames, covered with Class A rated fabric according to ASTM E-84. Corner brackets are integrated into the metal edged frame and receive mounting hardware. Resin hardened edges and spots are easily damaged and are not allowed.
 2. Small Diffuser Panels (Type I - less than 24 sq. ft. in size): Wall mounted; Impact resistant cylindrical section with two faceted ends; fabric wrapped.
 3. Large Diffuser Panels ((Type II - greater than or equal to 24 sq. ft. in size): Wall mounted; Impact resistant cylindrical section with two faceted sides; sound absorbing material mounted on rear surface; fabric wrapped.
 4. Mounting System:
 - a. Wall mounting (absorbers and diffusers): Four corner supports, designed to allow panels of same size to be interchanged. NOTE: 2" clearance above top of absorbers and diffusers needed for proper mounting.

- b. Ceiling mounting (absorbers and diffusers): four corner hook suspended by wire to ceiling; lay-in hardware for ceiling grid; direct ceiling mounting hardware.
- C. METAL FACED ACOUSTICAL WALL PANELS:
 - 1. WALL PANEL SYSTEM: shall include all panels, J trim perimeter, corner angles and Z furring, including acoustical component and include acoustical component as a complete package of this work.
 - 2. PRODUCT TEST REPORTS: All products furnished shall have a flame spread classification of 0-25 for a Class A or Class 1 rating in accordance with ASTM E84.
 - a. All products furnished shall be tested in accordance with ASTM C-423-90 for Sound Absorption.
 - b. Test results for a Type A mounting method shall yield an NRC (Noise Reduction Coefficient) of no less than 1.0.
 - c. Test results for a Type D-100 mounting method shall yield an NRC (Noise Reduction Coefficient) of no less than 1.15.
 - 3. ACCEPTABLE MANUFACTURERS
 - a. ALPRO Acoustical Systems
 - b. Noise Control Systems
 - c. Kinetics Noise Control

EXECUTION

- A. WARRANTY FOR FABRIC WRAPPED FIBERGLASS ACOUSTICAL PANELS
 - 1. Provide manufacturer's written warranty that products not in accordance with requirements of Contract Documents within three years after date of commencement of warranties shall be corrected promptly after receipt of written notice from Owner.
- B. METAL FACED ACOUSTICAL WALL PANELS
 - 1. Comply with manufacturer's printed instructions, governing regulations for Seismic Codes, and with the Ceiling & Interior Systems Construction Association standards applicable to work.

END OF 09 84 33



SPECIFICATION STANDARDS

09 91 00 - PAINTING

GENERAL

Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

PRODUCTS

- A. PAINT shall have a reflective value of 60-80%.
 - 1. At block wall surfaces use semi-gloss paint.
 - 2. Use eggshell paint for gypsum board walls.
 - 3. Provide finish in high traffic areas that can be scrubbed.
 - 4. Use flat paint for gypsum board ceilings.
 - 5. Except in toilet areas, specify waterbased solvent and mercury free paint with low or zero VOC's.
 - 6. Provide waterbased epoxy finishes in toilet areas.
 - 7. Limit number of paint colors to available standards. Avoid blends and coordinate colors to enhance school spirit.

- B. BLOCK FILLER: shall be applied to all exposed masonry block.
 - 1. Specify products with low or zero VOC's.

EXECUTION

COLOR SCHEMES: Avoid complex color schemes.

STORAGE: Store unused materials in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg. F. Protect from freezing.

Contractor shall provide school with 5 gallons of each color for touch-ups.

Painting of patched spots shall be from corner to corner.

PROJECT CONDITIONS

Do not apply paint in snow, rain, fog or mist, nor if air, surface, or paint material temperatures are below 50 deg. F. nor when relative humidity exceeds 85% nor when temperature is less than 5 deg. F. above the dew point.

Do not apply paint to damp or wet surfaces.

Maintain a temperature of 50 deg. F. for a period of 24 hours before beginning interior painting and for at least 24 hours after last application.

END OF 09 91 00



SPECIFICATION STANDARDS

10 11 00 - DRY ERASE BOARDS & TACKBOARDS

GENERAL

Dry erase boards and tackboards shall be provided in accordance with the building program and grade level for each specific project.

Attention to the constraints of applicable codes governing the use of combustible materials is required.

PRODUCTS

- A. **DRY ERASE BOARDS:** shall have 24 gauge porcelain enamel steel face with backer board in extruded aluminum frame with marker tray and head tackstrip.
 - 1. Finish shall be manufacturer's standard glossy white.
 - 2. Core shall be at least 1/2 in. thick particleboard or fiberboard material backed by either foil or aluminum for moisture seal.
 - 3. A music staff shall be pre-printed on the Band and Choral room dry erase boards.

- B. **TACKBOARDS:** shall be 1/8 in. thick composition cork mounted to 3/8 in. hardboard covered with 34 oz. self healing vinyl in extruded aluminum frame.
 - 1. The composition corkboard shall be made of pure cork material compounded with linseed oil and pigment on burlap back.

- C. **TACKSTRIPS:** shall be 1/4 in. thick composition cork in extruded aluminum frame.
 - 1. Width of tackstrip shall be 1 in. at dry erase board installations and 2 in. elsewhere.
 - 2. Map hooks and flag holders shall be provided at all tackstrip installations including at head of dry erase boards.

- D. **ACCESSORIES**
 - 1. Furnish standard continuous box-type aluminum marker tray with slanted front and cast aluminum end closures for each dry erase board.
 - 2. Where specified in program, furnish map rail complete with 1 in. to 2 in. wide display rail, end stops, and 2 map hooks for each 4 feet of rail, 2 flag holders per room, and hooks at art rooms.

- E. **Acceptable manufacturers:**
 - 1. American Chalkboard Co.
 - 2. Best Rite
 - 3. Claridge
 - 4. Lemco, Inc.
 - 5. Nelson/Adams (NACO)

EXECUTION

All dry erase board, tackboard, and tackstrip units shall be factory assembled.

Provide at a minimum where capable a 16 ft. market board with (2) 4 ft. tackboards on each end and (1) 4 ft tackboard at another location in the room. Bottom of boards shall be no more than 34 in. from finished floor.

At physical activity spaces such as dance studios, gyms, and multi-purpose rooms, do not provide protruding chalk trays at dry erase board installations. Instead, provide recessed holders for markers and erasers.

WARRANTY: All products shall have a 50 year warranty.

Lifetime Guarantee under conditions of normal use. Should not exhibit excessive fading of color, cracking or flaking.

END OF 10 11 00



SPECIFICATION STANDARDS

10 14 00 - SIGNAGE

GENERAL

An exterior sign shall be required at main site entrance and main building entrance as well as on each building.

Interior signs shall be required at all doors and spaces.

Final room names and numbers will be furnished by the Owner at the beginning of Design Development Phase.

PRODUCTS

- A. INTERIOR SIGNS: shall be manufactured from 1/16 in. clear matte acrylic that is sub-surface printed with a background color and laminated to a 1/16 in. opaque white or black acrylic base and has 1/16 in. raised acrylic letters, Andco Series 850-16 or equal.
1. All signage shall comply with the North Carolina Building Code, Volume 1-C, making buildings and facilities accessible to and usable by persons with disabilities, Chapter 18, Signage.
 - a. Changes in legal requirements are the responsibility of consultants. All signage must have the written information under the pictograms in order to comply with the current accessibility code.
 - b. Signage shall meet current code if different from above.
 2. Size
 - a. Signs should be of consistent size and proportion and must be large enough to convey necessary information.
 - b. Signs with numbers only should be 2" x 6".
 - c. For signs where room name or additional information is required, use a 6" x 6" format.
 - d. When additional information needs to be added to a room that only has a 2" x 6" number sign, a 4" x 6" sign can be added to achieve a consistent 6" x 6" module.
 3. Construction
 - a. The sign plaque should be manufactured with integral raised features.
 - b. For economy, general purpose sign plaques should be frameless.
 - c. For Administration, Classrooms and Student Support Services use signs with fixed numbers and removable inserts for name and title.
- B. EXTERIOR BUILDING SIGNS: Each building on campus shall have mounted on the exterior (at the main entrance to that building) 6" high aluminum lettering indicating the name of that building.
1. The name shall correspond to the designation assigned in accordance with local fire officials.
 2. Where possible, the mounting height shall be 8'-0" above finished grade (AFG).

- C. DEDICATION PLAQUE: Fabricate cast metal plaques to comply with requirements specified below for metal, border style, background texture and finish and to comply with requirements shown of thickness, size and copy.
1. Produce casting free from pits, scale, sand holes or other defects.
 2. Hand tool and buff borders and raised copy to produce the manufacturer's standard stain polished finish.
 3. Plaques are to be provided for new construction and major renovations only.
 4. Bronze Casting: Provide bronze castings, copper alloy UNS C83600, complying with the requirements of ASTM B 584.
 5. Size: 18" wide x 24" long x 5/8" thick
 6. Background Finish: Dark statuary finish with pebble texture
 7. Letter and border size: Satin polish
 8. Letter Size and Style: To be selected by Architect
 9. Border Style: Double line equal to Andco "No.2" border
 10. Mounting Height and Location: To be selected by Architect
 11. Copy: Each plaque shall include the Project Name, date of construction, the names and titles of all the County Commissioners, Board of Education Members as of the start of the project as evidenced by the date the Board of Education approves the general construction contract, the name and title of the Superintendent, the Architect's name and location and the General Contractor or Contractor Manager at Risk's name and location
 12. Coating: Each plaque shall be coated with a clear metal lacquer.
 13. Rubbing: Submit to Architect the GC/CMAR for proofing prior to final fabrication.
 14. Reproductions due to manufacturer flaw or errors will be at the GC/CMAR expense
- D. SITE SIGN:
1. The site sign shall be brick or precast designed by the Designer with direction from the Facilities Department.
 2. The site sign shall contain the name of the school and address in 6 in. high aluminum letters, and a 3' x 5' changeable message sign with 4 slots for 6 inch letters, flush with face of brick or precast.
 3. Changeable message area shall have a vandal resistant cover.
 4. Designer shall show all site signs per local jurisdiction, including disabled parking signs.

EXECUTION

- E. INTERIOR SIGNS
1. Signage shall be sized to accommodate copy.
 2. No abbreviations shall be permitted at Elementary schools.
 3. Abbreviations are strongly discouraged at Middle and High schools.

END OF 10 14 00



SPECIFICATION STANDARDS

10 21 13 - TOILET COMPARTMENTS

GENERAL

Durable, low maintenance product quality and installation is the primary consideration in the design of toilet room partitions.

PRODUCTS

- A. TOILET PARTITIONS
 - 1. Shall be of ceiling mounted, overhead braced, phenolic partitions at all group toilet installations.
 - 2. Doors shall match compartment construction.
 - 3. Bottom of panels and doors shall have a metal flame resistant trim.
 - 4. Use dark colors.
 - 5. Small patterned finish is preferred.
- B. HARDWARE AND FITTINGS
 - 1. Shall be heavy-duty extruded aluminum construction with bright finish.
 - 2. Door hinges shall be self closing (integral) piano type at all locations.
 - 3. Continuous wall brackets shall be used at group toilets.
 - 4. Use "through-bolts" (threaded insert with vandal resistant bolt at both sides) to secure hinges, brackets, stops and latches to doors and partitions.
 - 5. Provide vinyl bumper strip to absorb impact at doorstops and latch.

EXECUTION

- A. TOILET PARTITIONS
 - 1. Shall be secured with vandal resistant stainless steel machine screws with expansion anchors at masonry and tile walls and screwed to wood blocking at stud walls.
 - 2. Pilasters shall be secured to floor with a minimum of two #14-1.5 in. Stainless Steel screws with expansion anchors.
 - 3. Provide stainless steel or polymer resin base trim to conceal floor anchorage and leveling devices.
- B. COMPARTMENT DOORS: shall be provided at all toilet compartments.
- C. URINAL SCREENS
 - 1. If required, shall be provided between adjacent urinals and where located next to lavatories.
 - 2. These screens shall be of the same construction as the toilet partitions and be attached to the wall with continuous aluminum wall brackets.

END OF 10 21 13



SPECIFICATION STANDARDS

10 28 00 - TOILET ACCESSORIES

GENERAL

TOILET ACCESSORIES will be surface mounted type unless noted otherwise.

PRODUCTS

- A. PAPER TOWEL DISPENSERS
 - 1. Supplied and installed by Owner.
 - 2. Manufacturer: Seven Oaks Supply.
 - 3. Model
 - a. Model 1100 located in gang bathrooms.
 - b. Model 850 located in classrooms.
 - 4. Contractor to provide CCS with final number needed six (6) months prior to substantial completion. (Typical for all Owner supplied toilet accessories.)
- B. SOAP DISPENSERS
 - 1. Supplied and installed by Owner.
 - 2. Buckeye dispensers.
 - 3. At elementary, middle and high schools the unit will be American Specialties #0347 or equal by Bobrick.
- C. TOILET PAPER HOLDERS
 - 1. Supplied and installed by the Owner.
 - 2. Toilet paper dispensers are to be manufactured by Seven Oaks Supply, single roll unit.
 - 3. Unit shall not interfere with accessibility issues.
- D. WASTE RECEPTACLE
 - 1. Free standing units provided by the Owner.
- E. MIRRORS
 - 1. Polished stainless steel at middle & high school student toilet rooms and framed mirror glass elsewhere.
 - 2. Supplied and installed by Contractor.
- F. SANITARY NAPKIN DISPOSAL
 - 1. Supplied by and installed by Owner.

EXECUTION

- A. MIRRORS
 - 1. Size of mirrors at student toilet rooms to be approximately 20 in. wide by 60 in. high.

2. Mirrors shall be located on walls away from lavatories and mounted approximately 9 in. above finished floor.
3. Mirror shall be placed to not allow sight lines into bathroom.
4. Mirrors at staff toilets may be located over lavatories.
5. It is desirable to have one 20 in. x 60 in. full-length mirror at the women's staff toilet rooms.
6. Mirrors in weight rooms shall be 2 ft. 6 in. off the floor.

END OF 10 28 00



SPECIFICATION STANDARDS

10 44 00 - FIRE EXTINGUISHERS AND CABINETS

GENERAL

Fire Extinguishers shall be located in computer rooms, vocational technology rooms, art rooms and as per Project Building Program, as required by local code officials, and in accordance with the recommendations of NFPA 10, "Standard for Portable Fire Extinguishers".

In areas accessible to students where Fire Extinguishers are required, cabinets shall be provided.

PRODUCTS

- A. CABINETS: shall be 12 in. x 27 in. x 8 in. for semi-recessed or recessed installation.
 - 1. Breakable transparent glazing shall be scored Plexiglas.
 - 2. Specify recessed cabinets for all corridor locations.
 - 3. Maintain integrity of all rated walls.

- B. FIRE EXTINGUISHERS: Provide fire extinguishers of type, size, and capacity for each fire-protection cabinet.
 - 1. Include pictorial marking system complying with NFPA 10, Appendix B.
 - 2. Regular Dry-Chemical Type: UL-rated 10-B:C, 5-lb (2.3-kg) nominal capacity, with sodium bicarbonate-based dry chemical in manufacturer's standard enameled container.

EXECUTION

Install cabinets at the heights and locations required by Fire Marshal.

Mounting shall be into solid construction (i.e. metal studs/metal plate/solid wood blocking).

END OF 10 44 00



SPECIFICATION STANDARDS

10 51 00 - LOCKERS

GENERAL

Lockers shall be recessed in wall construction or have sloping tops and masonry end walls.

Bases shall be 4" treated wood.

PRODUCTS

- A. STUDENT LOCKERS
 - 1. Shall be of steel construction with 3 mil baked enamel finish.
 - 2. Doors shall be louvered.
 - 3. Hinges shall be steel, full loop, 5 knuckle, tight pin, welded to frame, and screwed to door.
 - 4. Provide a minimum of 3 hinges per door over 42 in. high and 2 hinges for doors 42 in. high and less.
 - 5. Minimum size for student locker compartments shall be 15 in. x 36 in. x 15 in. deep.
 - 6. Manufacturer's standard continuously sloped top, not less than 0.0359-inch (0.91-mm) steel sheet.
 - 7. Provide closures at ends and sloped corner fillers.
- B. ATHLETIC LOCKERS AT HIGH SCHOOLS AND MIDDLE SCHOOLS: to be a "football locker" 24" x 24" x 72".
- C. P.E. LOCKERS: 15 in. x 36 in. x 15 in, similar to student lockers except provide perforated doors at compartments for P.E. and athletic clothes.
- D. STAFF LOCKERS: Similar to student lockers except minimum size shall be 12 in. x 60 in. x 15 in. deep.

EXECUTION

Elementary School

- 1. Provide staff lockers for cafeteria workers.

Middle & High School

- 1. Provide lockers for cafeteria workers
- 2. Provide athletic lockers for students
- 3. Provide student lockers for students
- 4. Provide P.E. lockers for students

END OF 10 51 00



SPECIFICATION STANDARDS

10 73 16 - ALUMINUM CANOPIES

GENERAL

This section includes pre-engineered, pre-finished extruded aluminum walkway covers with internal gutters.

PRODUCTS

- A. MATERIALS:
1. Aluminum Members: Alloy and temper 6063-T-6.
 2. Factory Finish: Two coat fluoropolymer (Kynar 500) finish.
 3. Columns: Radius-cornered aluminum tubular extrusions.
 4. Beams: Open top aluminum tubular extrusions.
 5. Deck: extruded aluminum.
 6. Fascia: Manufacturer's standard extruded aluminum fascia sections.
 7. Acceptable manufacturers:
 - a. Perfection Designer Systems, Inc.
 - b. Dittmer Designer Aluminum
 - c. Mapes Designer Products
 - d. Peachtree Protective covers
 - e. E.L.Burns Co., Inc.
 - f. Mason-Florida, LLC

EXECUTION

Comply with manufacturer's instruction and recommendation for installation.

END OF 10 73 16



SPECIFICATION STANDARDS

11 00 00 - MISCELLANEOUS EQUIPMENT

GENERAL

This section provides information about miscellaneous equipment.

- A. Televisions are furnished by the Owner and installed by Contractor.
- B. LIBRARY DETECTION SYSTEM
 1. The Owner shall provide the library detection system.
 2. Electrical contractor to provide a dedicated circuit for library detection system.
 3. Note that the system requires high quality, surge and noise free electrical power for optimum performance.
- C. Incinerators shall not be used without approval from owner.
- D. Dust Collection System shall be provided for woodworking shop.
- E. Solid Waste Handling Equipment with discharge into sewage system shall not be used.
- F. KILN
 1. Kiln will be provided by Contractor.
 2. The kiln will be Skutt Model KM-1027 33 with 6 HDIF shelves and enviro-vent or equal.
 3. Kiln room shall have one (1) hour rated walls.
 4. Locate room adjacent to exterior wall.
 5. Provide 6 in. deep stationary drainable aluminum louver with motorized damper for make-up air source.
 6. Louver to have 1/2 in. x 1/2 in. screen.
 7. Fan and damper to be controlled by wall mounted thermostat.
 8. Electrical Requirements:
 - a. 208 Volts 31.7 Amps 11,000 Watts
 - b. Copper wire size 8, Breaker size 40
 - c. Hard wire with on/off switch.
 9. Provide 12 in. clearance on all sides of kiln.
 10. Provide 212° sprinkler head above kiln.
 11. A 110v outlet and a dryer vent are required for kiln's internal venting system.

END OF 11 00 00



SPECIFICATION STANDARDS

11 31 00 - EQUIPMENT AND APPLIANCES

GENERAL

This section includes all residential appliances and athletic appliances.

PRODUCTS

- A. RESIDENTIAL APPLIANCES:
1. Electric Range:
 - a. Type: 30 inch wide, slide in.
 - b. Radiant Surface Cooktop: Solid, tempered ceramic glass cooking surface with four concealed, radiant heating elements mounted below glass surface.
 - c. Oven: Self cleaning with porcelain-enamel interior with four rack levels.
 - d. Control Panel: Black glass combination surface burner/oven control panel. Include burner "ON" indicator light, automatic oven timer, and digital clock.
 - e. Storage Drawer.
 - f. Finish: Porcelain enamel on steel.
 - g. Operation: 40 amp, 208/240v.
 - h. Manufacturers:
 - 1) General Electric (Owner Preferred).
 - 2) Amana.
 - 3) Maytag.
 2. Exhaust Hood Non Vented: Provide General Electric, GE-JN327HWW
 3. Exhaust Hood Vented: Provide General Electric, GE-JV338HWW Vented Standard Range Hood
 4. Top-Mount Refrigerator: Provide General Electric, GE-GTS22KBMWW
 5. Clothes Washer: Provide Whirlpool, GHW9520M
 6. Clothes Dryer: Provide Whirlpool, GEW9200L
 7. Under Counter Refrigerator: Provide General Electric, GE: GMR06AAMWW
 8. Dishwasher: Provide Kitchen Aid, KUDI01ILWH
- B. ATHLETIC APPLIANCES AND EQUIPMENT: This section includes the athletic washer/extractor and athletic dryer.
- C. PRODUCTS: Acceptable manufacturers:
1. Belco - Belco "50" washer/extractor and 50 lb gas dryer
 2. UniMac-Alliance Laundry Systems
 3. Pellerin Milnor Corporation
 4. ASL Equipment company
 5. Continental

EXECUTION

WARRANTIES FOR RESIDENTIAL APPLIANCES

General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- A. Special Warranties: Written warranties, executed by manufacturer of each appliance specified agreeing to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
1. Electric Range: Five-year limited warranty for in-home service on surface-burner elements.
 2. Refrigerator: Five-year limited warranty on the sealed refrigeration system.
 3. Clothes Washer: 10 year limited warranty on the sealed refrigeration system, basket and outer tub, and five-year limited warranty for in-home service on the balance suspension system and drive transmission.
 4. Clothes Dryer: 20 year limited warranty for in-home service on the inner wash basket and out tub, and five-year limited warranty for in-home service on the balance suspension system and drive transmission.

ATHLETIC EQUIPMENT AND APPLIANCES

INSTALLATION: Comply with manufacturer's written instructions and local jurisdiction requirements.

WARRANTIES

Provide manufacturers 5-year warranty on frame, back gable and wash cylinder, and a 2 year warranty on main drive motor and all other washer parts.

Provide 2 year warranty on all dryer parts.

END OF 11 31 00



SPECIFICATION STANDARDS

11 40 00 - FOOD SERVICE EQUIPMENT

GENERAL

This section provides information about the food service equipment requirements.

Equipment receptacles to be single outlet 20 amp for dedicated equipment, at least 6 in. above ground and GFCI on convenience outlets.

PRODUCTS

Elementary School

- A. Air Curtain Fan
 - 1. Mars Door Company, Model 48CH, or owner approved equal manufactured by:
 - a. Berner International Corporation
 - b. Leading Edge c/o Marley Engineered Products.
 - 2. Provide air curtain fan having the following features:
 - a. Corrosion-resistant exterior with adjustable deflectors and adjustable air intake.
 - b. Electrical characteristics as scheduled.
 - c. Micro-switch for automatic door-actuated on-off control.

- B. Storage Shelving
 - 1. Manufacturers and products:
 - a. InterMetro Industries Corporation, Metro-Max Q Series.
 - b. Eagle Group, Lifestor Series.
 - c. Cambro Manufacturing Company, Cam Shelving.
 - 2. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal 74" high, numbered at one inch intervals.
 - b. Shelf connects to be wedge lock type with stainless steel corner collar.
 - c. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - d. Arrange using quantities and sizes as shown on plan drawings.
 - e. 600 pounds per shelf minimum capacity.

- C. Dunnage Rack
 - 1. Platform to be as manufactured by InterMetro Industries, Model HP223PD, or owner approved equal manufactured by:
 - a. Cambro Manufacturing Company.
 - b. Win-Holt Equipment Group.
 - 2. Provide single deck dunnage platform unit with the following features:
 - a. One piece rotomolded polymer with smooth surfaces, top and underside.

- b. Slotted deck.
 - c. Arrange as shown on Plan drawings, using quantities and sizes as specified.
- D. Cold Storage Assembly
1. Cold storage room assembly to comply with specifications and drawings as manufactured by:
 - a. Nor-Lake Incorporated.
 - b. Kolpak
 - c. Bally Refrigerated Boxes.
 2. Provide pre-fabricated cold storage room assembly of size and shape shown on plan and detail drawings.
 3. Exact overall size to be field verified prior to fabrication.
 - a. Insulation: Panels shall be insulated with 4" thick, injected urethane, expanded using an EPA approved blowing agent. Foam shall be 2.25 lb density, 95% closed cell. Panels shall meet ASTM E-84 (UL-723), be listed by Underwriters Laboratories, and shall comply with applicable portions of Section 2603 of the North Carolina State Building Code.
 - b. Coved Corners: Assembly shall be constructed so that all interior wall, floor and ceiling intersections shall comply with NSF requirements.
 - c. Cam lock fasteners: All panel intersections and wall, floor and ceiling intersections shall be secured by foamed in place cam lock fasteners.
 - d. Finishes: Exterior and interior finishes shall be shown on drawings.
 - e. Doors: 36" Door size, finish shall be shown on drawings, and shall be furnished complete with sill wiper gasket, lift type hinges. Hinges, latches and hardware shall be chrome plated and 2 adjustable screw type door levelers. Doors to be equipped with spring loaded, non-hydraulic automatic door closers. Freezer door to be equipped with perimeter heat. Exterior door(s) to be equipped with key lock having inside safety release feature. Door handle to include dead bolt, key lock, and padlock functions.
 - f. Thermometers: Each compartment to be provided with exterior flush mounted thermometer mounted at eye level to each door.
 - g. Lights: Each compartment to be furnished complete with manufacturer's standard light fixture, having protective cover, mounted and pre-wired to switch with pilot light in door section. Extra lights as needed to provide 30 foot candles 30" above floor. Lights to be furnished and set in place by this section. Light switch must include powered LED thermometer. All fluorescent lights in cooler and freezer to be low temperature.
 - h. Ceiling panels: To be one piece, self-supporting and span full width of assembly, with coved corners and edges.
 - i. Floor: Integral floor by Food Service Equipment Contractor, with 0.125" aluminum diamond tread finish. The floor and ceiling shall have maximum length panels to span full length of box if possible, otherwise stagger joints so there are no common "four corner" intersections and no joints occurring in doorways.
 - j. Refrigeration System: Temperature monitoring system with software for remote computer alert and read out. Shall be furnished by owner and installed by equipment supplier as part of a cold storage room assembly, provide each compartment with complete refrigeration system sized to maintain appropriate temperature. Condensing units to be air-

cooled, remote, outdoor, and placed on a concrete pad. Units to have performance and wiring characteristics as scheduled on drawings. Refrigeration systems to be designed for use with R404A or R-507 refrigerant only. Condensing units to be provided with painted galvanized steel all weather housing, controls, and crankcase heaters, all suitable for outdoor conditions, and located as shown on drawings. Unit coolers to be low silhouette type, mounted at locations shown on drawings. Performance and wiring characteristics to be as scheduled on drawings. Freezer systems to be provided with timed electric defrost. Evaporator drain lines to be provided by this section and extend to floor receptors outside assembly. Freezer drain lines to be wrapped with heater cable. Refrigerant piping to be AC copper tubing, hard temper, with wrought fitting and silver solder joints. Insulate suction lines with premolded foamed plastic insulation, thickness as recommended by manufacturer for temperature and application. Refrigeration systems to be provided with all required refrigerant piping, insulation, vibration eliminator, solenoid(s), dryer, suction line filter, expansion valve(s), thermostat(s), heat exchangers, and defrost timers, etc. as necessary for complete installation. Provide pump down control circuit consisting of thermostat and solenoid valve. All components including piping and insulation to be installed using accepted industry standards, manufacturer's instructions and first class workmanship.

- k. Miscellaneous: Assembly to be installed on depressed building slab. See detail drawing. Provide 1/8" diamond tread wainscot along exposed front exterior of assembly mounted from floor to 48" A.F.F. Provide trim strips, closure panels, etc, as necessary to trim assembly to adjacent building surfaces. Provide removable top closure panels with "C" channel rails. Lift-out panel sections to have turn-down edges for strength and are not to exceed 4'-0" in length. Provide clear plastic swinging doors on each opening. Size to suit openings. All materials to be corrosion resistant. Hinges to be gravity type. Doors to be Cool Curtain Clearvu swinging doors, CCI Industries, Inc., Model SS3678 or approved equal. Provide heated pressure relief port in freezer. Provide sleeves properly located for utility entrance, drain lines, and refrigeration lines, and after lines are installed, fill shelves with spray foam compound, suitable for use in refrigerated spaces. Cold storage room shall be erected by factory trained, or factory approved installers or shall be supervised by factory personnel. Refrigeration systems shall be installed by factory approved personnel. Shop drawing submittal shall indicate who the installer is, and a letter of approval shall accompany the submittal indicating the manufacturer's acceptance of the installers.

- 4. This specification does not constitute a complete description of cold storage assembly, also see plan and detail drawings.

E. One-Compartment Prep Sink

- 1. Sink to be manufactured by Select Stainless, Model 1B24-RD48-14, Universal Stainless, Inc., or manufactured equal.
- 2. Provide one compartment sink with drainboards as follows:
 - a. Approximate overall size: 30" Deep x 72" Long.
 - b. Marine (non-spill) table edges; 8" high backsplash along rear.

- c. Sink to be 24" x 24" x 14" Deep, creased to drain, with lever waste outlet.
 - d. Drainboard, to right of sink, to be 18" long, shelf under drainboard.
 - e. 14 gauge stainless steel top construction.
 - f. Legs and crossrails to be 1 5/8" diameter stainless steel with adjustable feet.
 - g. Provide T&S B231 faucet.
3. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- F. Slicer
- 1. Slicer to be manufactured by Hobart Corporation, Model 2712 or equal manufactured by:
 - a. Berkel Incorporated.
 - b. Globe Food Equipment Company.
 - 2. Provide slicer having the following features:
 - a. ½ HP motor wired for 120/1 operation, with cord and plug set.
 - b. Adjustable capacity: 12" wide or 7" diameter.
 - c. Adjustable gauge plate up to 1 ¼" thickness.
 - d. Stainless steel knife, 12" diameter.
 - e. Two speed automatic carriage drive.
 - f. Antimicrobial protection built into the external plastic components.
- G. Slicer Stand
- 1. Equipment to be manufactured by Delfield/Serv-0-Lift, Model 331-3424 or equal as manufactured by:
 - a. Caddy Corporation.
 - b. Universal Stainless, Incorporated.
 - 2. Provide stand with 18 gauge stainless steel top, having the following features.
 - a. 1 5/8" outside diameter stainless steel legs with welded cross rails and set of 5" diameter casters.
 - b. Stand shall have four sets stainless steel channel slides welded to legs, sized to suit 18" x 26" pans.
- H. Wall Shelf
- 1. Wall shelf to be as manufactured by Select Stainless, Model 6WS-12, Universal Stainless Inc, or manufactured equal.
 - 2. Provide wall shelf with the following features:
 - a. 16 gauge stainless steel construction.
 - b. Stainless steel angle brackets.
 - c. 14" deep x 72" long.
 - d. Mount 66" A.F.F. where shown on plan.
- I. Stainless Steel Corner Guard
- 1. Provide 14 ga. Stainless steel 4" x 4" x 48" H corner guard. Secure with four round or oval head stainless steel fasteners, equally spaced top to bottom each side.
 - 2. Install at location shown on drawings.

- J. Condensing Unit Rack
1. This item to be fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- K. Ingredients Bins
1. Ingredient bin to be manufactured by Rubbermaid, model 3602 or equal as manufactured by:
 - a. Cambro Manufacturing Company.
 - b. Win-Holt Equipment Group.
 2. Provide polypropylene ingredient bin with the following features:
 - a. Clear polycarbonate removable hinged lid.
 - b. Set of four 4" diameter casters.
 - c. Interior corners coved.
- L. Bakers Table
1. Worktable to be manufactured by Select Stainless, Model 6SLB-30-14-MOD, Universal Stainless, Inc., or manufactured equal.
 2. Provide stainless steel worktable with the following features:
 - a. 30" wide x 72" long.
 - b. Stainless steel top with enclosed end splashes (5" high)
 - c. 1 5/8" diameter stainless steel legs.
 - d. Open base with rear and side cross rails.
 - e. 5" high backsplash at rear.
- M. Proofer / Heater Cabinet
1. Cabinet manufacturer and product:
 - a. Royalton Food Service Equipment Company, model RHHP-VT-C4US.
 - b. Winston Industries, Model HA4522.
 - c. Or equal product manufactured by Food Warming Equipment Company.
 2. Provide mobile hot cabinet having the following features:
 - a. Fully sealed 2 gallon water pan in bottom of unit with unexposed element and ball valve drain system.
 - b. Rear air distribution channel for even heat.
 - c. Digital temperature readout and digital programmable controls.
 - d. Push pull handles.
 - e. Voltage characteristics as scheduled.
 - f. Half-height doors, with high tem silicone gaskets and field reversible hinges.
 - g. Stainless steel exterior and interior.
 - h. Top mounted controls and solid state temperature sensors, including food moisture control.
 - i. Fully insulated.
 - j. Capacity up to 35 18x26 sheet pans, up to 36 12x20x2.5 steam table pans.
 - k. High speed fan.
 - l. 6" heavy duty casters with brakes.
 - m. 2 Year parts and labor warranty.

- N. Exhaust Hood
1. Exhaust hood to be manufactured by CaptiveAire Systems, Model ND-PSP or manufactured equal from:
 - a. GreaseMaster.
 - b. Avtec, Industries.
 2. Provide double back island mount type canopy exhaust hood of size, shape, and content as shown on drawings, having the following features:
 - a. All exposed surfaces of 18 gauge 304 Series, 18-8 stainless steel construction.
 - b. NFPA 96 construction, including all joints and seams welded externally, continuous and liquid tight Hood to be tested by approved independent test facility and shall bear the label.
 - c. 5/8" diameter hanger rods to structural ceiling, approximately 48" on center.
 - d. Stainless steel baffle type U.L. classified grease extracting filters, with handles.
 - e. Integral grease gutter sloped to drain to grease receptacle.
 - f. Vapor-proof U.L. listed recessed fluorescent light fixtures.
 - g. Coordinated installation of fire control system as specified for Item 23.
 - h. Integral make-up air plenum along front as shown.
 - i. Provide spacer frame to allow passage of utility chase between hood sections and stainless steel trim on bottom and ends.
 - j. Removable stainless steel perimeter trim and or closure panels from top of hood to ceiling.
 - k. Food service equipment contractor shall provide and install any secondary supporting members required to suspend exhaust hoods. Hood supports shall include seismic bracing, if required, installed in accord with SMACNA guidelines.
 - l. Provide stainless steel cabinet on end of hood for fire control system, and pre-wire package. Switches to be remotely located in riser of stainless steel utility chase.
 - m. Makeup air to be conditioned air
- O. Fire Control System
1. Fire control system to be manufactured by Ansul by Tyco Fire Suppression and Building Products, Model R-102 or equal as manufactured by:
 - a. Badger Range Guard.
 - b. Pyro-Chem.
 2. Provide automatic wet chemical fire control system as required to protect exhaust hood and the cooking equipment located under this hood, with the following features.
 - a. All tanks, control heads, piping, relays, cable, fusible links, nozzles, elbows, etc., as required for complete system.
 - b. Brass nozzles and chrome plated or sleeved exposed piping.
 - c. Manual strike mechanism in accessible location.
 - d. Installation in accord with NFPA 17A code requirements and coordinate with exhaust hood construction and installation.
 - e. Four contacts for use by EC, one contact for alarm, one for supply fan shut-off, one for shunt trip actuation, and one spare.
 - f. Provide electric gas solenoid valve loose for installation by plumber, and manual reset relay.

- P. Stainless Steel Utility Chase
1. Utility chase to be manufactured by CaptiveAire Systems, Model UDI or equal as manufactured by:
 - a. Avtec Industries.
 - b. Shure Manufacturing Company.
 2. Provide island utility chase to serve items under exhaust hood, having the following features:
 - a. Stainless steel construction.
 - b. UL Label.
 - c. Designed to include electrical wire way.
 - d. Water tight electrical receptacles to match equipment.
 - e. 1 ½" gas manifold with tees and shut-off valves.
 - f. ¾" hot water and cold water manifold with tees and shut-off valves.
 - g. Gas and water quick disconnects and appropriate cord and plug sets as required by equipment for installation under Division 22, 23, and 26.
 - h. Manual gas shut –off valve for installation under Division 22.
 - i. Length as shown on drawings with utilities coming from above.
 - j. Mount switches for pre-starter and hood lights in end riser, approximately 28" above the floor.
 - k. Note: Cord and plugs must not interfere with placement of equipment. If angled plugs can't be used, equipment is to be hardwired using elbow at face plate.
 - l. All 120 V receptacles shall be GFCI type.

- Q. Convection Oven
1. Convection oven to be manufactured by:
 - a. Garland Commercial Industries.
 - b. Southbend, A Middleby Corporation Company.
 - c. G. S. Blodgett Corporation.
 2. Provide gas fired convection oven having the following features:
 - a. Two sections, stacked.
 - b. Manufacturer's standard finish.
 - c. Rear manifold connection with pressure regulator.
 - d. 90,000 BTU per compartment.
 - e. Set of adjustable stainless steel legs.
 - f. Suitable for use with type of gas at site.
 - g. Back rear motor housing enclosures.
 - h. 2@1/3 HP blower motors, voltage as schedule, with cord and plug sets.
 - i. Porcelain interior liners.
 - j. Multi-pane window in door.
 - k. Electric ignition.
 - l. 2 year warranty.

- R. Mixer, 30 QT
1. Mixer to be manufactured by Hobart Corporation, Model HL300 or equal manufactured by:
 - a. Blakeslee USA.
 - b. Varimixer.
 2. Provide 30 QT. gear-driven floor model mixer having the following features:
 - a. ¾ HP motor, voltage as scheduled.
 - b. 20 QT. stainless steel bowl.

- c. Manufacturer's standard finish.
 - d. Attachment hub.
 - e. Vegetable slicer attachment with disc holder, grating disc, and three shredding discs: 3/32, 3/16, 5/16.
 - f. Flat beater and stainless steel wire whip, and dough hook.
- S. Trunion Kettle: 6 Gallon
- 1. Trunion Kettle as manufactured by Market Forge Industries, Model MT6G100A, or equal as manufactured by:
 - a. Cleveland range, LLC.
 - b. Vulcan, a division of ITW Food Equipment Group, LLC.
 - 2. Provide trunion kettle on modular stand, having the following features:
 - a. One 6 gallon capacity table-top type kettle.
 - b. Manufacturer's standard finishes.
 - c. Mount on stainless steel cabinet.
 - d. Install at location shown on drawings.
 - e. Stainless steel adjustable feet.
 - f. Kettle fill faucet.
 - g. Removable lid for kettle.
 - h. Self-generating steam generator, gas fired, suitable for type of gas at site.
 - i. Pressure regulator.
 - j. Nickel plated boiler.
 - k. Z-Track removable boiler for service.
 - l. 100,000 BTU steam generator.
 - m. 2 year warranty.
- T. Tilting Skillet
- 1. Tilting braising pan to be manufactured by Market Forge Industries, Model 30P-STGL or equal as manufactured by:
 - a. Groen.
 - b. Cleveland Range, LLC.
 - 2. Provide gas-fired tilting skillet having the following features.
 - a. Open leg base
 - b. Center based tilt mechanism.
 - c. Capacity of approximately 30 gallons.
 - d. Utility requirements as scheduled.
 - e. Suitable for use with type of gas at site.
 - f. Electric tilt with manual override.
 - g. One piece hinged cover.
 - h. Automatic gas shut off when pan is tilted.
 - i. Electric spark ignition.
 - j. Dual pantry fill faucet with swing spout.
 - k. 2 year warranty.
- U. Floor Trough with Grate
- 1. Grate to be IMC/Teddy Food Service Equipment, Model FT-18-36 or equal as manufactured by:
 - a. Serv-O-Lift/Eastern.
 - b. Select.

2. Provide floor trough with removable grate having the following features:
 - a. Fiberglass grate
 - b. Fiberglass construction with non-slip surface.
 - c. Suitable for use in Food Service applications.
 - d. 14 gauge 304 18-8 stainless steel, all welded with coved corners and anchor straps, full perimeter flange for installation under grout.
 - e. Pitch to waste and provide stainless steel cup with removable perforated stainless steel basket.
 - f. Overall trough size to be approximately 1'6" wide x 3'0" long.
 - g. See plan for clarification. Coordinate with General Contractor and Plumbing Contractor to assure proper installation.
 - h. Fall to the drain, flush with the floor

V. Convection Steamer

1. Convection steamer to be as manufactured by Market Forge Industries, Model ETP-10G or Groen or equal product.
2. Provide gas fired, 10 pan two-compartment pressureless steamer having the following features:
 - a. ENERGY STAR RATED
 - b. Water management system to limit each compartment to use less than 7 gallons of water per hour.
 - c. Non-stacked pressureless steamer with five-pan capacity per compartment.
 - d. Unit mounted over a 24" wide X 64" tall stainless steel modular base cabinet and frame.
 - e. The compartment powered by independent 42,000 BTU atmospheric, stainless steel, generator with automatic blow down. Not a pour in.
 - f. Each compartment controlled with 60-minute timer and hold feature.
 - g. Built in water filter system with no external plumbing.
 - h. Load compensating timers.
 - i. Single point cold water line connection.
 - j. Electronic ignition.
 - k. Automatic steam shut-off when doors are opened.
 - l. Delimiting ports for each generator.
 - m. Voltage as scheduled.
 - n. 2 year warranty.

W. Combi Oven

1. Combination oven steamer to be manufactured by Alto-Shamm, Model 10-18ES or equal product as manufactured by:
 - a. Cleveland Range, LLC.
 - b. G. S. Blodgett Corporation.
2. Provide combination convection oven/steamer with the following features:
 - a. Capacity: (12) 12x20x2.5" food pans or (6) 18x26" sheet pans.
 - b. All stainless steel finishes.
 - c. Programmable controls.
 - d. Safety door interlock feature.
 - e. Hosable interior, with side mount spray unit.
 - f. Cooking modes: pressureless steam, hot air, or combination of steam and hot air.

- g. Retherm mode.
 - h. Self-contained steam source.
 - i. Auto drain.
 - j. Manufacturer furnished and approved water filter system.
 - k. Fry baskets.
- X. Worktable with Utensil Rack
1. This item to be custom fabricated in accord with General Requirements of specification and with plan and detail drawings.
- Y. Pan Rack
1. Pan rack to be manufactured by Delfield/Serv-O-Lift, Model RIU-69-12 or approved equal manufactured by:
 - a. Cres-Cor.
 - b. Kelmax, a Leggett and Platt Storage Products Group.
 2. Provide aluminum pan rack having the following features:
 - a. Two level guide supports suitable for use with 18"x26" pans, or 12"x20" pans.
 - b. Capacity: 12@4 7/8" on centers.
 - c. 5" diameter swivel casters, with brakes.
 - d. Horizontal corner bumpers.
- Z. Utility Cart
1. Cart to be Lakeside, Model 543 or equal product as manufactured by:
 2. PlastOcon Incorporated.
 3. Caddy Corporation.
 4. Provide stainless steel welded card having the following features:
 - a. Push handle, with bumpers.
 - b. Three shelves, 18 gauge stainless steel, 650 lb. capacity, and 21x33".
 - c. Two 5" diameter swivel casters, two 8" fixed, polyurethane tires.
 - d. Non-marking vinyl corner bumpers.
- AA. Worktable: Mobile
1. Worktable to be as manufactured by Select Stainless, Model 6SU-30-14, Universal Stainless, Inc. or fabricated equal.
 2. Provide stainless steel worktable having the following features:
 - a. 30" wide x 72" long.
 - b. 14 gauge stainless steel top with non-spill edges on all sides and reinforcing on underside.
 - c. 1 5/8" diameter stainless steel legs, with casters and brakes.
 - d. Stainless steel undershelf.
 - e. 20" x 20" x 5" deep stainless drawer set in s/s channel frame and mount on s/s roller bearings.
- BB. Equipment Stand: Mobile
1. Provide stand, Robot Coupe USA, Inc., Model R199, Approximately 18"x32"x32"H, with casters or product as manufactured by owner approved equal.
 2. Design for use with processor.
- CC. Food Processor
1. Processor to be Robot Coup USA, Inc., Model CL50D, or approved equal

2. Provide vegetable processor with the following features:
 - a. Table top design.
 - b. Continuous feed head.
 - c. Magnetic safety switch.
 - d. 1 ½ hp motor with cord and plug.
 - e. Push button on/off single speed.
 - f. Furnish the following blades:
 - 1) 3 mm
 - 2) 5 mm
 - 3) 7x7 mm julienne plate
 - 4) 14 mm slicing plate
 - 5) 14 x 14 mm dicing grid
 - g. Capacity approximately 400 servings/hour.
- DD. Three Compartment Sink
1. Sink to be as manufactured by Select Stainless, Model 3B24-2D30-14 or Universal Stainless, Inc, or manufactured equal.
 2. Provide three compartment sink with drainboards as follows:
 - a. Approximate overall size: 30" Deep x 136" Long.
 - b. Marine (non-spill) table edges; 8" high backsplash along rear.
 - c. Sinks to be 24" x 30" x 14" deep, creased to drains, with lever waste outlets.
 - d. Drainboards to be 30" long.
 - e. 14 gauge stainless steel top construction.
 - f. Legs and crossrails to be 1 5/8" diameter stainless steel with adjustable feet.
 - g. Provide T&S B231 faucet centered over sink partitions (two each).
- EE. Utensil Rack
1. Utensil rack to be as manufactured by Select Stainless, Model 12DPR-S, Universal Stainless. Inc. or manufactured equal.
 2. Provide utensil rack with the following features:
 - a. 16 gauge stainless steel double pot rack, 3/16" x 2" each.
 - b. Stainless steel bar, mounted to brackets.
 - c. Double stainless steel, non-removable pot hooks approximately 8" O.C.
- FF. Hose Reel
1. Hose reel assembly to be manufactured by T&S Brass, with listed components or equal product as manufactured by:
 - a. Chicago Faucets.
 - b. Fisher Manufacturing Company.
 2. Provide open type retractable all-in-one hose reel system having the following features:
 - a. B-1551 reel, open, stainless steel.
 - b. Continuous pressure type vacuum breaker, B-963.
 - c. Shut off control, ORK3.
 - d. MV-0522 spray gun.
 - e. B-131 base faucet.
 - f. 50 feet of heavy duty hose.
 - g. All chrome interconnecting piping.
 - h. Mount on wall at location shown on drawings.

- GG. Silver Chute
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- HH. Soiled Dishtable
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- II. Silver Soak Sink
1. Soak sink to be Advance/Tabco, Model 9-FSS-20 or equal product as manufactured by:
 - a. Universal Stainless, Inc.
 - b. Select Stainless.
 2. Provide stainless steel mobile sink having the following features:
 - a. Stainless steel legs.
 - b. 5" diameter casters.
 - c. Sloped bottom.
 - d. 1 ½" drain with adjustable rubber hose.
- JJ. Pre-Rinse Unit
1. Provide deck mounted pre-rinse unit having the following features:
 - a. Flexible stainless steel hose.
 - b. Self-closing spray nozzle.
 - c. Wall support bracket.
 - d. Mixing valve with integral check valves.
 - e. Low flow spray valve.
- KK. Disposer
1. Disposer to be manufactured by Salvajor, Model 300-SA-ARSS or equal product manufactured by:
 - a. InSinkErator.
 - b. Hobart Corporation.
 2. Provide disposer with 3HP motor, having the following features:
 - a. Voltage characteristics as scheduled.
 - b. Water cooled.
 - c. Sink adaptor flange to be furnished for welding to sink.
 - d. Auto-reversing control center including, disconnect switch, magnetic starter(s) and start/stop buttons, in stainless steel NEMA 4 enclosure, or better.
 - e. Thermal overload protection either built into motor or in control center.
 - f. Solenoid and vacuum breaker.
 - g. Control center to be mounted out of splash zone, under drain board on stainless steel mounting bracket as shown on details.
 - h. Cast aluminum construction.
 - i. Short neck only as necessary to provide clearance under disposer for cleaning.
 - j. Water in trough only comes on when disposer is on.

LL. Condensate Hood

1. Hood to be manufactured by CaptiveAire Systems, Model VH-1 or equal product as manufactured by:
 - a. Avtec Industries.
 - b. K-Tech.
2. Provide single bank wall mount type condensate exhaust hood, having the following features:
 - a. All exposed surfaces of 18 gauge 304 series, 18-8 stainless steel construction.
 - b. 5/8" diameter hanger rods to structural ceiling approximately 48" on center.
 - c. Aluminum filter.
 - d. Integral gutter along rear with drain.
 - e. Nominal size, sized as shown on drawings and details.
 - f. Removable stainless steel perimeter trim and or closure panels from top of hood to ceiling.
 - g. Food Service Equipment Contractor shall provide and install any secondary supporting members required to suspend exhaust hoods. Hood supports shall include seismic bracing, if required, installed in accord with SMACNA guidelines.

MM. Dish Machine: Gas Heated

1. Dishmachine as manufactured by Insinger Admiral, Model 44-4 or Hobart Corporation, Model C44A or an equal product manufactured by:
 - a. Champion Moyer Diebel, Inc.
2. Provide single tank rack conveyor type dishmachine with recirculating pre-wash, having the following features.
 - a. Stainless steel hood and tanks, tall housing.
 - b. Standard finish base and stainless steel adjustable legs.
 - c. Operation as indicated on plan.
 - d. Pre-wash pump motor: Not less than 1HP.
 - e. Wash pump motor: Not less than 2 HP.
 - f. Conveyor motor: Not less than 1/6 HP.
 - g. Gas tank heat, with thermostatic control.
 - h. All components pre-wired to stainless steel control panel, with voltage characteristics as scheduled and with control circuit step-down transformer when required for control voltage.
 - i. Stainless steel condensate hood both ends of machine, with adjustable dampers and stainless steel duct to +4" above ceiling.
 - j. Lower spray arms in pre-wash section.
 - k. Automatic tank fill with manual by-pass.
 - l. Idle pump shut-off feature.
 - m. Ven fan control to turn fan on with machine.
 - n. Include six peg racks, four flat racks, and three bun pan racks.
 - o. Stainless steel splash guards.
 - p. Opti-rinse system to reduce water usage without slowing machine capacity.
 - q. Side loader.

- r. "Crossfire" washing with 3 upper and lower wash arms, and 4 side wash sprayer arms.
- s. Color coded curtain designation on outside of dish machine.
- t. Front mounted washing pumps for easy maintenance access.
- u. Automatic splash guards.
- v. Fan and soap connections in control panel.
- w. Interchangeable scrap bins.
- x. Raised control panel.
- y. Stainless steel chain drive.
- z. Easy access cleaning tank.
- aa. Opening must accommodate sheet pan width and length
- bb. Provide 4 metal reinforced open ended pan racks.
- cc. 2 year warranty.

NN. Booster Heater: Gas

- 1. Booster to be as manufactured by Hatco Corporation, Model PMG-200, Hobart Corporation or approved equal.
- 2. Provide gas booster heater with the following features:
 - a. Stainless steel frame and 5 gallon tank.
 - b. Stainless steel front, top, and legs.
 - c. Six tube type burners.
 - d. 195,000 BTU/Hr input.
 - e. Pressure reducing valve.
 - f. Electrical characteristics as scheduled.
 - g. Inlet temperature gauge/outlet temperature gauge.
 - h. Temperature/pressure relief valve.
 - i. Blended phosphate water treatment system.
 - j. Drain valve.
 - k. Forced draft system with duct to underside of condensate hood. Connections for external air pressure switch.
 - l. Electric ignition.
 - m. Interconnect to exhaust system so booster only operates when fan is running.
 - n. Setup to comply with local codes.

OO. Clean Dishtable

- 1. This item to be custom fabricated in accord with the General Requirements of specifications with plan and detail drawing.

PP. Clean Pot Storage Shelf

- 1. Shelving to be as manufactured by InterMetro Corporation, Model 2448NK3 or equal product manufactured by:
 - a. Amco, a division of Leggett and Platt Storage Products Group.
 - b. Eagle Foodservice Equipment, Metal Masters.
- 2. Provide four-tier epoxy coated shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal 74" high, numbered at one inch intervals.
 - b. Treated chrome plated shelving and uprights with bonded epoxy coating.
 - c. Each unit to be free standing, with 5" diameter casters.
 - d. Arrange using quantities and sizes as shown on plan drawings.

- QQ. Rack Dolly
1. Provide 20"x20" stainless steel rack dolly, as manufactured by InterMetro Corporation, Model D2020N or approved equal.
- RR. Ice Machine with Bin
1. Ice machine to be manufactured by Manitowoc Ice, Model SD-0602A, with S-570 bin or equal product as manufactured by:
 - a. Scotsman Ice Systems.
 - b. Ice O-Matic.
 2. Provide cube ice maker and bin having the following features:
 - a. Ice Maker:
 - 1) Capacity, based on 70 degree F incoming water 90 degree F ambient, of approximately 540 lbs.
 - 2) Self-contained, air cooled.
 - 3) Electrical characteristics as scheduled.
 - 4) Stainless steel housing.
 - 5) Arrange to make dice cube ice.
 - 6) Mount ice maker on bin and install at location shown on drawings.
 - 7) Water filter.
 - b. Bin:
 - 1) Bin to have capacity of approximately 1,000 pounds.
 - 2) Stainless steel exterior
 - 3) 6" adjustable legs
- SS. Pass-Thru Refrigerator
- TT. Refrigerator to be as manufactured by Nor-Lake Corporation, Model Nova PR243SSG/0 or product as manufactured by:
1. Traulsen.
 2. Delfield.
 3. Provide one-section pass-through refrigerator with top mounted air-cooled condensing unit, exterior digital thermometer, cylinder door locks and top mounted condensate evaporator, having the following features:
 - a. Half-height doors, glass on kitchen side, hinged as showing on drawings.
 - b. Flush mount interior top, no fans to hang into interior.
 - c. Energy Star 2010 Listed.
 - d. 18 months parts and labor, 5 year compressor warranty.
 - e. Programmable digital display.
 - f. Stainless steel exterior and interior.
 - g. Removable, universal type pan slides, both half-door sections.
 - h. Set of adjustable stainless steel legs, with stainless steel toe plate attached pro legs on serving side.
 - i. Stainless steel banking strip.
 - j. Stainless steel trim trip to seal cabinet to adjacent building surfaces.
 - k. Wired for 115/1 operation.
 - l. Install cabinet so that controls face kitchen area.
- UU. Pass-Thru Hot Cabinet
1. Manufacturers:
 - a. Nor-Lake Corporation.

- b. Traulsen.
- c. Delfield.
- 2. Provide one-section pass-through hot cabinet, having the following features:
 - a. Half-height doors, glass on kitchen side, hinged as showing on drawings.
 - b. Flush mount interior top, no fans to hang into interior.
 - c. Energy Star 2010 Listed.
 - d. 18 months parts and labor.
 - e. Programmable digital display.
 - f. Solid stainless steel non-louvered cowl.
 - g. Stainless steel exterior and interior.
 - h. Removable, universal type pan slides, both half-door sections.
 - i. stainless steel toe plate attached pro legs on serving side.
 - j. Stainless steel banking strip.
 - k. Stainless steel trim trip to seal cabinet to adjacent building surfaces.
 - l. Wired for 115/1 operation.
 - m. Install cabinet so that controls face kitchen area.

VV. Dish Cart

- 1. Cart to be Cambro Corporation, Model TDC30 or approved equal.
- 2. Provide dish and tray cart with the following features:
 - a. Polyurethane material, color as selected by Owner.
 - b. 6" swivel casters, two with brakes.
 - c. Open on one side and top, with molded push handles at each end.
 - d. Two adjustable dividers.

WW. Plain top Counter

- 1. Counter to be as manufactured by Duke Manufacturing, Model 309-25SS, Shelleysteel, Model SC-50-NU, or Delfield.
- 2. Provide modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate panels, color as selected by Architect.
 - f. Solid "V" type tray slide.
 - g. Open understorage with shelf.
 - h. 6" high legs with adjustable feet.
 - i. Line up locks.
 - j. Install in banked line-up as shown on drawings.
 - k. 2 Year Warranty
 - l. 34" body height
 - m. Single tier counter protector with glass top shelf with 8" adjustable plate glass sneeze guard front (for self service). Protector shall be designer style with 1-1/2 in. diameter stainless steel uprights.

XX. Hot / Cold Food Combination Counter

- 1. Hot food counter to be by Duke Manufacturing, Model E302-25SS + 2 well cold, Shelleysteel Model SHC-60-NU, or Delfield.

2. Provide modular serving counter having the following features:
 - a. 470 Watt energy efficient heating elements with easy service access.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. 2 Individual hot food wells with pre-wired controls, voltage characteristics as scheduled. Wells to be dry/moist, with individually valved drains, manifolded to a single valve drain in an operator accessible location.
 - g. Hot wells recessed to hold sheet pans.
 - h. 46"L - NSF #7 cold food pan unit with manifolded drains, cord and plug.
 - i. Provide custom designer series self-service sneeze guard with 6" intermediate shelf mounted below top of sneeze guard but above hot wells. Configuration to be reviewed and approved by Owner.
 - j. 6" stainless steel legs with adjustable feet.
 - k. Stainless steel ribbed tray slide.
 - l. Cord and plug set.
 - m. Plastic laminate panels, color as selected by Architect.
 - n. Install in banked line-up as shown on drawings.
 - o. Line up locks.
 - p. Open under storage with shelf.
 - q. 34" body height
 - r. Single tier counter protector with glass top shelf with 8" adjustable plate glass sneeze guard front (for self service). Protector shall be designer style with 1-1/2 inch diameter stainless steel uprights.
 - s. 2 Year Warranty

YY. Hot Food Counter

1. Hot food counter to be by Duke Manufacturing, Model E305-25SS, Shelleysteel, Model SH-5-NU, or Delfield.
2. Provide modular serving counter having the following features:
 - a. 470 Watt energy efficient heating elements with easy service access for elements and controls.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. Five individual hot food wells with pre-wired controls, voltage characteristics as scheduled. Wells to be dry/moist, with individually valved drains, manifolded to a single valve drain in an operator accessible location.
 - g. Hot wells recessed to hold sheet pans.
 - h. Provide custom designer series self-service sneeze guard with 6" intermediate shelf mounted below top of sneeze guard but above hot wells. Configuration to be reviewed and approved by Owner.
 - i. 6" stainless steel legs with adjustable feet.
 - j. Stainless steel ribbed tray slide.
 - k. Cord and plug set.
 - l. Plastic laminate panels, color as selected by Architect.
 - m. Install in banked line-up as shown on drawings.

- n. Line up locks.
- o. Open under storage with shelf.
- p. 34" body height
- q. 2 Year Warranty.

ZZ. Milk Cabinet

- 1. Dispenser to be as manufactured by Nor-Lake, Masterbilt or True.
- 2. Provide mobile carton milk cabinet having the following features:
 - a. Stainless steel cabinet with vertical corner bumpers.
 - b. Single piece U shaped Stainless steel interior liner for seamless interior wrap.
 - c. Fully insulated.
 - d. Set of 4" diameter swivel casters with brakes.
 - e. Self-contained, air cooled refrigeration system with cord and plug set.
 - f. Externally mounted dial thermometer.
 - g. Cold wall construction
 - h. Dual service.
 - i. 5 year compressor warranty.
 - j. 5 year structural body warranty.

AAA. Tray and Silver Stand

- 1. Dispenser to be as manufactured by Duke Manufacturing, Model TTS-32SS, Shelleysteel, Model SCTS-36, or Delfield.
- 2. Provide tray and silver stand with the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 32"L x 31"W x 42"H approximate size.
 - e. Stainless platform base with elevated shelf.
 - f. 5" diameter casters with brakes.
 - g. Silverware dispenser with 7 utensil cylinders in stainless steel holder.
 - h. 2 Year Warranty

BBB. Cashier Stand

- 1. Cashier counter to be as manufactured by Duke Manufacturing, Model 306-25SS, Shelleysteel, Model SCS-36, or Delfield.
- 2. Provide modular cashier counter having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. Two, 2 inch dia. Holes in top for electrical cords.
 - g. Stainless steel undershelf.
 - h. Convenience outlet under top.
 - i. Stainless steel drawer, lockable.
 - j. Solid "V" type tray slide.
 - k. 6" legs.
 - l. Line up locks.
 - m. Install in banked line up as shown on Plan.
 - n. 2 Year Warranty

Middle School

- A. Air Curtain Fan – Quantity as Scheduled
 - 1. Provide air curtain fan having the following features:
 - a. Corrosion-resistant exterior with adjustable deflectors and adjustable air intake.
 - b. Electrical characteristics as scheduled.
 - c. Micro-switch for automatic door-actuated on-off control.
 - 2. Fan to be as manufactured by Mars Door Company, Model 48CH, Berner, or Leading Edge.

- B. Dunnage Rack – Quantity as Scheduled
 - 1. Provide single deck dunnage platform unit with the following features:
 - a. One piece rotomolded polymer with smooth surfaces, top and underside.
 - b. Slotted deck.
 - c. Arrange as shown on Plan drawings, using quantities and sizes as specified.
 - 2. Platform to be as manufactured by Metro, Model HP223PD, Cambro, or Win-Holt.

- C. Storage Shelving – Quantity as Scheduled
 - 1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal 74” high, numbered at one inch intervals.
 - b. Shelf connects to be wedge lock type with stainless steel corner collar.
 - c. 5 inch diameter. Casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pounds per shelf minimum capacity.
 - 2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam Shelving.

- D. Cold Storage Assembly – Quantity as Scheduled
 - 1. Provide pre-fabricated cold storage room assembly of size and shape shown on plan and detail drawings.
 - 2. Exact overall size to be field verified prior to fabrication.
 - a. Insulation: Panels shall be insulated with 4” thick, injected urethane, expanded using an EPA approved blowing agent, with no high density foam frames of forms in panel. Foam shall be 2.25 lb density, 95% closed cell. Panels shall meet ASTM E-84 (UL-723), be listed by Underwriters Laboratories, and shall comply with applicable portions of Section 2603 of the North Carolina State Building Code.
 - b. Coved Corners: Assembly shall be constructed so that all interior wall, floor and ceiling intersections shall comply with NSF requirements.
 - c. Cam lock fasteners: All panel intersections and wall, floor and ceiling intersections shall be secured cam lock fasteners.
 - d. Finishes: Exterior and interior finishes shall be shown on drawings.
 - e. Doors: 36” Door size, finish shall be shown on drawings, and shall be furnished complete with sill wiper gasket, lift type hinges. Hinges,

latches and hardware shall be chrome plated with 2 adjustable screw type door levelers. Doors to be equipped with spring loaded non-hydraulic automatic door closers. Freezer door to be equipped with perimeter heat. Exterior door(s) to be equipped with key lock having inside safety release feature. Door handle to include dead bolt, key lock, and padlock functions.

- f. Thermometers: Each compartment to be provided with exterior flush mounted thermometer mounted at eye level to each door.
- g. Lights: Each compartment to be furnished complete with manufacturer's standard light fixture, having protective cover, mounted and pre-wired to switch with pilot light in door section. Extra lights as needed to provide 30 foot candles 30" above floor. Lights to be furnished and set in place by this section. Light switch must include powered LED thermometer. All fluorescent lights in cooler and freezer to be low temperature.
- h. Ceiling panels: To be one piece, self-supporting and span full width of assembly, with coved corners and edges.
- i. Floor: Integral floor by Food Service Equipment Contractor, with 0.125" aluminum diamond tread finish. The floor and ceiling shall have maximum length panels to span full length of box if possible, otherwise stagger joints so there are no common "four corner" intersections and no joints occurring in doorways.
- j. Refrigeration System Temperature monitoring system with software for remote computer alert and read out. Shall be furnished by owner and installed by equipment supplier as part of a cold storage room assembly, provide each compartment with complete refrigeration system sized to maintain appropriate temperature. Condensing units to be air-cooled, remote, outdoor and placed on a concrete pad. Units to have performance and wiring characteristics as scheduled on drawings. Refrigeration systems to be designed for use with R404A or R-507 refrigerant only. Condensing units to be provided with painted galvanized steel all weather housing, controls, and crankcase heaters, all suitable for outdoor conditions, and located as shown on drawings. Unit coolers to be low silhouette type, mounted at locations shown on drawings. Performance and wiring characteristics to be as scheduled on drawings. Freezer system to be provided with timed electric defrost. Evaporator drain lines to be provided by this section and extend to floor receptors outside assembly. Freezer drain lines to be wrapped with heater cable. Refrigerant piping to be AC copper tubing, hard temper, with wrought fitting and silver solder joints. Insulate suction lines with premolded foamed plastic insulation, thickness as recommended by manufacturer for temperature and application. Refrigeration systems to be provided with all required refrigerant piping, insulation, vibration eliminator, solenoid(s), dryer, suction line filter, expansion valve(s), thermostat(s), heat exchangers, and defrost timers, etc. as necessary for complete installation. Provide pump down control circuit consisting of thermostat and solenoid valve. All components including piping and insulation to be installed using accepted industry standards, manufacturer's instructions and first class workmanship.
- k. Miscellaneous: Assembly to be installed on depressed building slab. See detail drawing. Provide 1/8" diamond tread wainscot along exposed front exterior of assembly mounted from floor to 48" A.F.F.

Provide trim strips, closure panels, etc, as necessary to trim assembly to adjacent building surfaces. Provide removable top closure panels with "C" channel rails. Lift-out panel sections to have turn-down edges for strength and are not to exceed 4'-0" in length. Provide clear plastic swinging doors on each opening. Size to suit openings. All materials to be corrosion resistant. Hinges to be gravity type. Doors to be Cool Curtain Clearvu swinging doors, CCI Industries, Inc., Model SS3678 or approved equal. Provide heated pressure relief port in freezer. Provide sleeves properly located for utility entrance, drain lines, and refrigeration lines, and after lines are installed, fill shelves with spray foam compound, suitable for use in refrigerated spaces. Cold storage room shall be erected by factory trained, or factory approved installers or shall be supervised by factory personnel. Refrigeration systems shall be installed by factory approved personnel. Shop drawing submittal shall indicate who the installer is, and a letter of approval shall accompany the submittal indicating the manufacturer's acceptance of the installers.

- I. This specification does not constitute a complete description of cold storage assembly, also see plan and detail drawings.
3. Cold storage room assembly to be as manufactured by Norlake, Kolpak, or Bally, complying with specifications and drawings.

E. Storage Shelving – Quantity as Scheduled

1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal 74" high, numbered at one inch intervals.
 - b. Shelf connectors to be wedge lock type with stainless steel corner collar.
 - c. 5 inch diameter casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pound per shelf minimum capacity.
2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam-Shelving.

F. One-Compartment Prep Sink – Quantity as Scheduled

1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
2. Provide one compartment sink with drainboards as follows:
 - a. Approximate overall size: 30" Deep x 84" Long.
 - b. Marine (non-spill) table edges; 8" high backsplash along rear.
 - c. Sink to be 24" x 24" x 14" Deep, creased to drain, with lever waste outlet.
 - d. Drainboard, to right of sink, to be 60" long, shelf under drainboard.
 - e. 14 gauge stainless steel top construction.
 - f. Legs and crossrails to be 1 5/8" diameter stainless steel with adjustable feet.
 - g. Provide T&S B231 faucet.
 - h. 20" x 20" x 5" deep stainless drawer set in s/s channel frame and mount on s/s roller bearings.
 - i. Elevated shelf length of table connected to splash.

3. Sink to be as manufactured by Select Stainless, Model 7SUB-30-14, Universal, or fabricated equal.
- G. Equipment Stand – Quantity as Scheduled
1. Provide stand with 18 gauge stainless steel top, having the following features:
 - a. Double stainless steel shelves.
 - b. 27" x 32" x 31" high with casters and brakes.
 2. Equipment stand to be as manufactured by Delfield/Serv-O-Lift, model 331-3424, Caddy, or Universal Stainless.
- H. Slicer – Quantity as Scheduled
1. Provide slicer having the following features:
 - a. ½ HP motor wired for 120/1 operation, with cord and plug set.
 - b. Adjustable capacity: 12" wide or 7" diameter.
 - c. Adjustable gauge plate up to 1 ¼" thickness.
 - d. Stainless steel knife, 12" diameter.
 - e. Two speed automatic carriage drive.
 - f. Antimicrobial protection built into the external plastic components.
 2. Slicer to be as manufactured by Hobart, Model 2712, Berkel, or Globe.
- I. Mobile Shelf, Four-Tier – Quantity as Scheduled
1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal, 74" high, numbered at one inch intervals.
 - b. Shelf connectors to be wedge lock type with stainless steel corner collar.
 - c. 5" diameter casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pound per shelf minimum capacity.
 2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam-Shelving.
- J. Faucet With Spray Hose – Quantity as Scheduled
1. Provide wall mounted hot and cold water faucet having the following features:
 - a. Nominal 5'-0" long flexible stainless steel hose.
 - b. Self-closing spray nozzle.
 - c. Wall mount mixing valve with integral check valves.
 - d. Vacuum breaker and nozzle hook.
 2. Hose unit to be as manufactured by T&S Brass and Bronze works, Model B-167, Chicago, or Fisher.
- K. Mixer, 30 QT – Quantity as Scheduled.
1. Provide 30-quart gear driven floor model (bench) mixer having the following features:
 - a. ½ HP motor, voltage as scheduled.
 - b. 30-quart stainless steel bowl.
 - c. Manufacturer's standard finish.
 - d. Attachment hub.
 - e. Vegetable slicer attachment, with disc holder, grating disc, and three shredding discs: 3/32, 3/16, 5/16.

- f. Flat beater and stainless steel wire whip, and dough hook.
 - 2. Mixer to be as manufactured by Hobart, Model HL300, Blakeslee, and Varimixer.
- L. Ingredients Bins – Quantity as Scheduled
- 1. Provide polypropylene ingredient bin with the following features:
 - a. Clear polycarbonate removable hinged lid.
 - b. Set of four 4" diameter casters.
 - c. Interior corners coved.
 - 2. Ingredient bin to be as manufactured by Rubbermaid, model 3602, Cambro, or Win-Holt.
- M. Bakers Table – Quantity as Scheduled
- 1. This item to be custom fabricated in accord with General Requirements of Specifications with plan and detail drawings.
- N. Proofer/Heater Cabinet – Quantity as Scheduled
- 1. Provide mobile hot cabinet having the following features:
 - a. Fully sealed 2 gallon water pan in bottom of unit with unexposed element and ball valve drain system.
 - b. Rear air distribution channel for even heat.
 - c. Digital temperature readout and digital programmable controls.
 - d. Push pull handles.
 - e. Voltage characteristics as scheduled.
 - f. Half-height doors, with high tem silicone gaskets and field reversible hinges.
 - g. Stainless steel exterior and interior.
 - h. Top mounted controls and solid state temperature sensors, including food moisture control.
 - i. Fully insulated.
 - j. Capacity up to 35 18x26 sheet pans, up to 36 12x20x2.5 steam table pans.
 - k. High speed fan.
 - l. 6" heavy duty casters with brakes.
 - m. 2 Year parts and labor warranty.
 - 2. Cabinet to be as manufactured by Royalton model RHHP-VT-C4US, Winston Model HA4522 or FWE.
- O. Stainless Steel Utility Chase – Quantity as Scheduled
- 1. Provide island utility chase to serve items under exhaust hood, having the following features:
 - a. Stainless steel construction.
 - b. UL Label.
 - c. Designed to include electrical wire way.
 - d. Water tight electrical receptacles to match equipment.
 - e. 1 ½" gas manifold with tees and shut-off valves.
 - f. ¾" hot water and cold water manifold with tees and shut-off valves.
 - g. Gas and water quick disconnects and appropriate cord and plug sets as required by equipment for installation under Division 22, 23, and 26.
 - h. Manual gas shut –off valve for installation under Division 22.
 - i. Length as shown on drawings with utilities coming from above.

- j. Mount switches for pre-starter and hood lights in end riser, approximately 28" above the floor.
 - k. Note: Cord and plugs must not interfere with placement of equipment. If angled plugs can't be used, equipment is to be hardwired using elbow at face plate.
 - l. All 120 V receptacles shall be GFCI type if convenience outlet, dedicated receptacles to be single outlet 20 amp.
 - 2. Utility chase to be as manufactured by Captive-Aire, Model UDI, Avtec, or Select.
- P. Fire Control System – Quantity as Scheduled
- 1. Provide automatic wet chemical fire control system as required to protect exhaust hood, Item 17, and the cooking equipment located under this hood, and having the following features.
 - a. All tanks, control heads, piping, relays, cable, fusible links, nozzles, elbows, etc., as required for complete system.
 - b. Brass nozzles and chrome plated or sleeved exposed piping.
 - c. Manual strike mechanism in accessible location.
 - d. Installation in accord with NFPA 17A code requirements and coordinate with exhaust hood construction and installation.
 - e. Four contacts for use by EC, one contact for alarm, one for supply fan shut-off, one for shunt trip actuation, and one spare.
 - f. Provide electric gas solenoid valve loose for installation by plumber, and manual reset relay.
 - 2. Fire control system to be as manufactured by Ansul, Model R-102, Range Guard, or Pyro-Chem.
- Q. Exhaust Hood – Quantity as Scheduled
- 1. Provide double back island mount type canopy exhaust hood of size, shape, and content as shown on drawings, having the following features:
 - a. All exposed surfaces of 18 gauge 304 Series, 18-8 stainless steel construction.
 - b. NFPA 96 construction, including all joints and seams welded externally, continuous and liquid tight Hood to be tested by approved independent test facility and shall bear the label.
 - c. 5/8" diameter hanger rods to structural ceiling, approximately 48" on center.
 - d. Stainless steel baffle type U.L. classified grease extracting filters, with handles.
 - e. Integral grease gutter sloped to drain to grease receptacle.
 - f. Vapor-proof U.L. listed recessed fluorescent light fixtures.
 - g. Coordinated installation of fire control system as specified for Item 23.
 - h. Integral make-up air plenum along front as shown.
 - i. Provide spacer frame to allow passage of utility chase between hood sections and stainless steel trim on bottom and ends.
 - j. Removable stainless steel perimeter trim and or closure panels from top of hood to ceiling.
 - k. Food service equipment contractor shall provide and install any secondary supporting members required to suspend exhaust hoods. Hood supports shall include seismic bracing, if required, installed in accord with SMACNA guidelines.

- l. Provide stainless steel cabinet on end of hood for fire control system, and pre-wire package. Switches to be remotely located in riser of stainless steel utility chase.
 - m. Makeup air to be conditioned
 - 2. Exhaust hood to be as manufactured by Captive-Aire, Model ND-PSP, GreaseMaster, or Avtec.
- R. Convection Oven – Quantity as Scheduled
 - 1. Provide gas fired convection oven having the following features:
 - a. Two sections, stacked.
 - b. Manufacturer's standard finish.
 - c. Rear manifold connection with pressure regulator.
 - d. 90,000 BTU per compartment.
 - e. Set of adjustable stainless steel legs.
 - f. Suitable for use with type of gas at site.
 - g. Back rear motor housing enclosures.
 - h. 2@1/3 HP blower motors, voltage as schedule, with cord and plug sets.
 - i. Porcelain interior liners.
 - j. Multi-pane window in door.
 - k. Electric ignition.
 - l. 2 year warranty.
 - 2. Convection oven to be as manufactured by Garland, Southbend, or Blodgett Forge.
- S. Convection Steamer – Quantity as Scheduled.
 - 1. Provide gas fired, 10 pan two-compartment pressureless steamer having the following features:
 - a. ENERGY STAR RATED
 - b. Water management system to limit each compartment to use less than 7 gallons of water per hour.
 - c. Non-stacked pressureless steamer with five-pan capacity per compartment.
 - d. Unit mounted over a 24" wide X 64" tall stainless steel modular base cabinet and frame.
 - e. The compartment powered by independent 42,000 BTU atmospheric, stainless steel, generator with automatic blow down. Not a pour in.
 - f. Each compartment controlled with 60-minute timer and hold feature.
 - g. Built in water filter system with no external plumbing.
 - h. Load compensating timers.
 - i. Single point cold water line connection.
 - j. Electronic ignition.
 - k. Automatic steam shut-off when doors are opened.
 - l. Delimiting ports for each generator.
 - m. Voltage as scheduled.
 - n. 2 year warranty.
 - 2. Convection steamer to be as manufactured by Market Forge, Model ETP-10G or Groen.

- T. Tilting Skillet – Quantity as Scheduled.
1. Provide gas-fired tilting skillet having the following features.
 - a. Open leg base
 - b. Center based tilt mechanism.
 - c. Capacity of approximately 30 gallons.
 - d. Utility requirements as scheduled.
 - e. Suitable for use with type of gas at site.
 - f. Electric tilt with manual override.
 - g. One piece hinged cover.
 - h. Automatic gas shut off when pan is tilted.
 - i. Electric spark ignition.
 - j. Dual pantry fill faucet with swing spout.
 - k. 2 year warranty.
 2. Tilting brazing pan to be as manufactured by Market Forge, Model 30P-STGL, Groen or Cleveland.
- U. Floor Trough with Grate – Quantity as Scheduled.
1. Provide floor trough with removable grate having the following features:
 - a. Fiberglass grate
 - 1) Fiberglass construction with non-slip surface.
 - 2) Suitable for use in Food Service applications.
 - 3) Equivalent to IMC/Teddy Duradek, Model PFG
 - b. Trough
 - 1) 14 gauge 304 18-8 stainless steel, all welded with coved corners and anchor straps, full perimeter flange for installation under grout.
 - 2) Pitch to waste and provide stainless steel cup with removable perforated stainless steel basket.
 - 3) Overall trough size to be approximately 1'6" wide x 3'0" long.
 - 4) See plan for clarification. Coordinate with General Contractor and Plumbing Contractor to assure proper installation.
 - 5) Fall to the drain, flush with the floor
 2. Grate to be IMC/Teddy Food Service Corp., Model FT-18-36, Serv-O-Lift/Eastern, or Select.
- V. Trunnion Kettle – Quantity as Scheduled.
1. Provide trunnion kettle on modular stand, having the following features:
 - a. Two 24-quart capacity table-top type kettles.
 - b. Manufacturer's standard finishes.
 - c. Mount on stainless steel cabinet to match adjacent equipment.
 - d. Install at location shown on drawings.
 - e. Stainless steel adjustable feet.
 - f. Kettle fill faucet.
 - g. Pressure-reducing valve.
 - h. Self-generating steam generator, gas fired, suitable for type of gas at site.
 - i. Pressure regulator.
 - j. Approved water filter kit.
 - k. 100,000 BTU steam generator.
 - l. 2 year warranty.

2. Trunion Kettle to be as manufactured by Market Forge Model MT6T6G100A, Cleveland or Vulcan.
- W. Combi Oven – Quantity as Scheduled.
1. Provide combination convection oven/steamer with the following features:
 - a. Capacity: (12) 12x20x2.5" food pans or (6) 18x26" sheet pans.
 - b. All stainless steel finishes.
 - c. Programmable controls.
 - d. Safety door interlock feature.
 - e. Hosable interior, with side mount spray unit.
 - f. Cooking modes: pressureless steam, hot air, or combination of steam and hot air.
 - g. Retherm mode.
 - h. Self-contained steam source.
 - i. Auto drain.
 - j. Manufacturer furnished and approved water filter system.
 - k. Fry baskets.
 2. Combination oven steamer to be as manufactured by Rational, Model SCC62, or approved equal.
- X. Worktable with Utensil Rack – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specification and with plan and detail drawings.
- Y. Pan Rack – Quantity as Scheduled.
1. Provide aluminum pan rack having the following features:
 - a. Two level guide supports suitable for use with 18"x26" pans, or 12"x20" pans.
 - b. Capacity: 12@4 7/8" on centers.
 - c. 5" diameter swivel casters, with brakes.
 - d. Horizontal corner bumpers.
 2. Pan rack to be as manufactured by Delfield/Serv-O-Lift, Model RIU-69-12, Cres-Cor, or Kelmax.
- Z. Utility Cart – Quantity as Scheduled.
1. Provide stainless steel welded card having the following features:
 - a. Push handle, with bumpers.
 - b. Two shelves, 14 gauge stainless steel, 650 lb. capacity, and 21x33".
 - c. Two 5" diameter swivel casters, two 8" fixed, polyurethane tires.
 - d. Non-marking vinyl corner bumpers.
 2. Cart to be Lakeside, Model 543, Wilder, or Kelmax.
- AA. Worktable – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- BB. Hose Reel – Quantity as Scheduled.
1. Provide open type retractable all-in-one hose reel system having the following features:
 - a. B-1434 reel, open, stainless steel.
 - b. Continuous pressure type vacuum breaker, B-963.
 - c. Shut off control, ORK3.

- d. MV-0522 spray gun.
 - e. B-131 base faucet.
 - f. 50 feet of heavy duty hose.
 - g. All chrome interconnecting piping.
 - h. Mount on wall at location shown on drawings.
2. Hose reel assembly to be as manufactured by T&S, with above components Chicago Faucet, or Fisher.
- CC. Equipment Stand, Mobile – Quantity as Scheduled.
1. Provide stand, Robot Coupe R199, Approximately 18"x32"x32"H, with casters. Designed for use with processor.
- DD. Food Processor – Quantity as Scheduled.
1. Provide vegetable processor with the following features:
 - a. Motor base of cast fiberglass and continuous feed housing of cast aluminum.
 - b. Ventilated base.
 - c. 1 ½ HP fan cooled motor.
 - d. Belt drive.
 - e. Magnetic safety switch.
 - f. Push button on off switch.
 - g. Continuous feed head with half moon and round opening with aluminum food pushers.
 - h. Furnish the following blades:
 - 1) 3/16" slicing plate
 - 2) 1/8" medium grating plate
 - 3) 5/16" slicing plate
 - 4) 3/8" coarse grating plate
 - 5) 1/4" julienne plate
 - 6) 3/4" dicing kit
 - i. Include R199 cart, approximately 18"x32"x32"H, with caster designed for use with processor.
 2. Processor to be Robot Coup, Model CL50D, or approved equal.
- EE. Worktable, Mobile – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- FF. Ice Machine with Bin – Quantity as Scheduled.
1. Provide cube ice maker and bin having the following features:
 - a. Ice Maker:
 - 1) Capacity, based on 70 degree F incoming water 90 degree F ambient, of approximately 540 lbs.
 - 2) Self-contained, air cooled.
 - 3) Electrical characteristics as scheduled.
 - 4) Stainless steel housing.
 - 5) Arrange to make dice cube ice.
 - 6) Mount ice maker on bin and install at location shown on drawings.
 - 7) Water filter.

- b. Bin:
 - 1) Bin to have capacity of approximately 1,000 pounds.
 - 2) Stainless steel exterior
 - 3) 6" adjustable legs
 - 2. Ice machine to be as manufactured by Manitowoc, Model SD-1002A, with S-970 bin, Hoshizaki, or Scotsman.
- GG. Pass-Thru Refrigerator – Quantity as Scheduled.
 - 1. Provide one-section pass-through refrigerator with top mounted air-cooled condensing unit, exterior digital thermometer, cylinder door locks and top mounted condensate evaporator, having the following features:
 - a. Half-height doors, glass on kitchen side, hinged as showing on drawings.
 - b. Flush mount interior top, no fans to hang into interior.
 - c. Energy Star 2010 Listed.
 - d. 18 months parts and labor, 5 year compressor warranty.
 - e. Programmable digital display.
 - f. Stainless steel exterior and interior.
 - g. Removable, universal type pan slides, both half-door sections.
 - h. Set of adjustable stainless steel legs, with stainless steel toe plate attached pro legs on serving side.
 - i. Stainless steel banking strip.
 - j. Stainless steel trim trip to seal cabinet to adjacent building surfaces.
 - k. Wired for 115/1 operation.
 - l. Install cabinet so that controls face kitchen area.
 - 2. Refrigerator to be as manufactured by Norlake Nova model PR243SSG/0, Victory or Traulsen.
- HH. Pass-Thru Hot Cabinet – Quantity as Scheduled.
 - 1. Provide one-section pass-through hot cabinet, having the following features:
 - a. Half-height doors, glass on kitchen side, hinged as showing on drawings.
 - b. Flush mount interior top, no fans to hang into interior.
 - c. Energy Star 2010 Listed.
 - d. 18 months parts and labor, 5 year compressor warranty.
 - e. Programmable digital display.
 - f. Solid stainless steel non-louvered cowl.
 - g. Removable, universal type pan slides, both half-door sections.
 - h. Set of adjustable stainless steel legs, with stainless steel toe plate attached pro legs on serving side.
 - i. Stainless steel banking strip.
 - j. Stainless steel trim trip to seal cabinet to adjacent building surfaces.
 - k. Wired for 115/1 operation.
 - l. Install cabinet so that controls face kitchen area.
 - 2. Manufacturer to match item GG.
- II. Clean Pot Storage Shelf – Quantity as Scheduled.
 - 1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal 74" high, numbered at one inch intervals.

- b. Shelf connectors to be wedge lock type with stainless steel corner collar.
 - c. 5 inch diameter casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pound per shelf minimum capacity.
2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam-Shelving.
- JJ. Dish Cart – Quantity as Scheduled.
- 1. Provide dish and tray cart with the following features:
 - a. Polyurethane material, color as selected by Owner.
 - b. 6” swivel casters, two with brakes.
 - c. Open on one side and top, with molded push handles at each end.
 - d. Two adjustable dividers.
 - 2. Cart to be Cambro, Model TDC30 or approved equal.
- KK. Clean Dishtable – Quantity as Scheduled.
- 1. This item to be custom fabricated in accord with the General Requirements of specifications with plan and detail drawing.
- LL. Rack Dolly – Quantity as Scheduled.
- 1. Provide 20”x20” stainless steel rack dolly, as manufactured by Metro, Model D2020N.
- MM. Booster Heater, Gas – Quantity as Scheduled.
- 1. Provide gas booster heater with the following features:
 - a. Stainless steel frame and 5 gallon tank.
 - b. Stainless steel front, top, and legs.
 - c. Six tube type burners.
 - d. 195,000 BTU/Hr input.
 - e. Pressure reducing valve.
 - f. Electrical characteristics as scheduled.
 - g. Inlet temperature gauge/outlet temperature gauge.
 - h. Temperature/pressure relief valve.
 - i. Blended phosphate water treatment system.
 - j. Drain valve.
 - k. Forced draft system with duct to underside of condensate hood. Connections for external air pressure switch.
 - l. Electric ignition.
 - m. Interconnect to exhaust system so booster only operates when fan is running.
 - n. Setup to comply with local codes.
 - 2. Booster to be as manufactured by Hatco, Model CMG230, Hobart, or approved equal.
- NN. Condensate Hood – Quantity as Scheduled.
- 1. Provide single bank wall mount type condensate exhaust hood, having the following features:
 - a. All exposed surfaces of 18 gauge 304 series, 18-8 stainless steel construction.

- b. 5/8" diameter hanger rods to structural ceiling approximately 48" on center.
 - c. Aluminum filter.
 - d. Integral gutter along rear with drain.
 - e. Nominal size, sized as shown on drawings and details.
 - f. Removable stainless steel perimeter trim and or closure panels from top of hood to ceiling.
 - g. Food Service Equipment Contractor shall provide and install any secondary supporting members required to suspend exhaust hoods. Hood supports shall include seismic bracing, if required, installed in accord with SMACNA guidelines.
2. Hood to be as manufactured by Captive-Aire, Model VH-1, Avetco, or Ktech.
- OO. Dish Machine, Gas Heated – Quantity as Scheduled.
- 1. Provide single tank rack conveyor type dishmachine with recirculating pre-wash, having the following features.
 - a. Stainless steel hood and tanks, tall housing.
 - b. Standard finish base and stainless steel adjustable legs.
 - c. Operation as indicated on plan.
 - d. Pre-wash pump motor: Not less than 1HP.
 - e. Wash pump motor: Not less than 2 HP.
 - f. Conveyor motor: Not less than 1/6 HP.
 - g. Gas tank heat, with thermostatic control.
 - h. All components pre-wired to stainless steel control panel, with voltage characteristics as scheduled and with control circuit step-down transformer when required for control voltage.
 - i. Stainless steel condensate hood both ends of machine, with adjustable dampers and stainless steel duct to +4" above ceiling.
 - j. Lower spray arms in pre-wash section.
 - k. Automatic tank fill with manual by-pass.
 - l. Idle pump shut-off feature.
 - m. Ven fan control to turn fan on with machine.
 - n. Include six peg racks, four flat racks, and three bun pan racks.
 - o. Stainless steel splash guards.
 - p. Opti-rinse system to reduce water usage without slowing machine capacity.
 - q. Side loader.
 - r. "Crossfire" washing with 3 upper and lower wash arms, and 4 side wash sprayer arms.
 - s. Color coded curtain designation on outside of dish machine.
 - t. Front mounted washing pumps for easy maintenance access.
 - u. Automatic splash guards.
 - v. Fan and soap connections in control panel.
 - w. Interchangeable scrap bins.
 - x. Raised control panel.
 - y. Stainless steel chain drive.
 - z. Easy access cleaning tank.
 - aa. 2 year warranty.
 - 2. Dish machine to be as manufactured by Insinger Admiral 44-4, Hobart Model C44A, or Champion.

- PP. Pre-Rinse Unit – Quantity as Scheduled.
1. Provide deck mounted pre-rinse unit having the following features:
 - a. Flexible stainless steel hose.
 - b. Self-closing spray nozzle.
 - c. Wall support bracket.
 - d. Mixing valve with integral check valves.
 2. Pre-rinse unit to be as manufactured by T&S Brass and Bronze Works, Model B-113, Chicago Faucet, or Fisher.
- QQ. Disposer – Quantity as Scheduled.
1. Provide disposer with 3HP motor, having the following features:
 - a. Voltage characteristics as scheduled.
 - b. Water cooled.
 - c. Sink adaptor flange to be furnished for welding to sink.
 - d. Auto-reversing control center including, disconnect switch, magnetic starter(s) and start/stop buttons, in stainless steel NEMA 4 enclosure, or better.
 - e. Thermal overload protection either built into motor or in control center.
 - f. Solenoid and vacuum breaker.
 - g. Control center to be mounted out of splash zone, under drain board on stainless steel mounting bracket as shown on details.
 - h. Cast aluminum construction.
 - i. Short neck only as necessary to provide clearance under disposer for cleaning.
 2. Disposer to be manufactured by Salvajor, Model 300-SA-ARSS, Insinkerator, or Hobart.
- RR. Soiled Dishtable – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- SS. Utensil Rail – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- TT. Three Compartment Sink – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- UU. Tray and Silver Stand – Quantity as Scheduled.
1. Provide tray and silver stand with the following features:
 - a. Full 2 year warranty.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 32”L x 31”W x 42”H approximate size.
 - f. Stainless platform base with elevated shelf.
 - g. 5” diameter casters with brakes.
 - h. Silverware dispenser with 7 utensil cylinders in stainless steel holder.
 - i. 2 Year Warranty
 2. Dispenser to be as manufactured by Duke Manufacturing, Model TTS-32SS, Shelleysteel, Model SCTS-36-MOD, or Delfield.

- VV. Hot Food Counter – Quantity as Scheduled.
1. Provide modular serving counter having the following features:
 - a. 470 Watt energy efficient heating elements with easy service access.
 - b. Full 2 year warranty.
 - c. 300 series stainless steel.
 - d. Stainless (non galvanized) steel panels behind laminate.
 - e. 14 gauge tubular frame construction.
 - f. 14 gauge stainless steel top.
 - g. Five individual hot food wells with pre-wired controls, voltage characteristics as scheduled. Wells to be dry/moist, with individually valved drains, manifolded to a single valve drain in an operator accessible location.
 - h. Hot wells recessed to hold sheet pans.
 - i. Provide custom designer series self-service sneeze guard with 6” intermediate shelf mounted below top of sneeze guard but above hot wells. Configuration to be reviewed and approved by Owner.
 - j. 6” stainless steel legs with adjustable feet.
 - k. Stainless steel ribbed tray slide.
 - l. Cord and plug set.
 - m. Plastic laminate panels, color as selected by Architect.
 - n. Install in banked line-up as shown on drawings.
 - o. Line up locks.
 - p. Open under storage with shelf.
 - q. 2 Year Warranty
 2. Hot food counter to be by Duke Manufacturing, Model E305-25SS, Shelleysteel, Model SH-5-NU-MOD, or Delfield.
- WW. Cold Food Frost Top Counter – Quantity as Scheduled.
1. Provide Modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. Full 2 year warranty.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. Pull out refrigeration unit for easy service access.
 - g. Basic counter section with exterior body panels having plastic laminate facing, and 14 gauge stainless steel top.
 - h. Self contained mechanically refrigerated frost top, nominal 30” wide, located as shown on Plan.
 - i. 2-tier designer style display case over frost top. Configuration to be reviewed and approved by Owner.
 - j. 6” stainless steel legs with adjustable feet.
 - k. Stainless steel inverted “V” tray slide to match adjacent counters.
 - l. Cord and plug set.
 - m. Plastic laminate panels, color as selected by Architect.
 - n. Open under storage
 - o. Install in banked line-up as shown on Drawings.
 - p. 2 Year Warranty
 2. Counter to be as manufactured by Duke Manufacturing, Model 334-25SS, Shelleysteel, Model SCFT-60-NU-MOD, or Delfield.

- XX. Corner Counter – Quantity as Scheduled.
1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. Full 2 year warranty.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. Open understorage with shelf.
 - g. 6” stainless steel legs with adjustable feet.
 - h. Line up locks.
 - i. Install in banked line-up as shown on drawings.
 - j. 2 Year Warranty
 2. Counter to be as manufactured by Duke Manufacturing, Model ATU-90SS, Shelleysteel, Model SC-MOD, or Delfield.
- YY. Counter Top Refrigerator – Quantity as Scheduled.
1. Provide one-section counter top refrigerator with air-cooled condensing unit, exterior dial thermometer, door locks condensate evaporator, having the following features:
 - a. Full-height hinged glass door and fluorescent interior lighting.
 - b. Painted exterior of finish selected by Architect.
 - c. White aluminum interior walls, stainless steel interior bottom.
 - d. Stainless steel 4” adjustable legs.
 - e. Adjustable vinyl coated shelves.
 - f. Voltage as scheduled, cord and plug.
 2. Refrigerator to be True, Model GDM-5, Beverage-Air, or Victory.
- ZZ. Plain Top Counter – Quantity as Scheduled.
1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. Full 2 year warranty.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. Plastic laminate panels, color as selected by Architect.
 - g. Solid “V” type tray slide.
 - h. Open understorage with shelf.
 - i. 6” high legs with adjustable feet.
 - j. Line up locks.
 - k. Install in banked line-up as shown on drawings.
 - l. 2 Year Warranty
 2. Counter to be as manufactured by Duke Manufacturing, Model 309-25SS, Shelleysteel, Model SC-50-NU, or Delfield.
- AAA. Beverage/Ice Cream Counter – Quantity as Scheduled.
1. Provide modular serving counter of size and content as shown on plan and detail drawings, having the following features:
 - a. Full 2 year warranty.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.

- d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. Drain trough and grate.
 - g. Plastic laminate panels, color as selected by Architect.
 - h. Solid "V" type tray slide.
 - i. Die stamped hole(s) in top for utility lines.
 - j. 6" high legs with adjustable feet.
 - k. Install in banked line-up at location shown on drawings.
 - l. Line up locks.
 - m. Provide cutouts and ventilation for Item 75, ice cream cabinet, handle to face customer side.
2. Counter to be as manufactured by Duke Manufacturing, Model 311-25SS, Shelleysteel, Model SC-84-NU-MOD, or Delfield.

BBB. Ice Dispenser – Quantity as Scheduled.

- 1. Provide manual-fill automatic ice dispenser having the following features:
 - a. Approximate capacity of 150 pounds.
 - b. Manufacturer's standard finish.
 - c. Counter-top style, with integral drain pan.
 - d. Set of 4" high legs.
 - e. Wired for 120/1 operation with cord and plug set.
 - f. Water Dispenser.
- 2. Unit to be as manufactured by Cornelius, Model DB90S, Servend, or Follett.

CCC. Iced Tea Dispenser – Quantity as Scheduled.

- 1. Provide iced tea dispenser with the following features.
 - a. 5 gallon capacity.
 - b. Stainless steel construction.
 - c. Lid.
 - d. Faucet.
- 2. Iced tea dispenser to be as manufactured by Bunn-O-Matic, Model TDS3, or approved equal.

DDD. Cashier Stand – Quantity as Scheduled.

- 1. Provide modular cashier counter having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. Two, 2 inch diameter, holes in top for electrical cords.
 - g. Stainless steel undershelf.
 - h. Convenience outlet under top.
 - i. Stainless steel drawer, lockable.
 - j. Solid "V" type tray slide.
 - k. 6" legs.
 - l. Line up locks.
 - m. Install in banked line up as shown on Plan.
 - n. 2 Year Warranty
- 2. Cashier counter to be as manufactured by Duke Manufacturing, Model 306-25SS, Shelleysteel, Model SCS-36, or Delfield.

- EEE. Traffic Guide Rail, Fixed – Quantity as Scheduled.
1. Provide stainless steel tubular guide rail as follows:
 - a. 2" diameter tubing.
 - b. Two strand horizontal rails.
 - c. All welded.
 - d. Core anchored in floor at free-standing ends.
 - e. Railing to consist of three straight sections, approximately 7'-0" long, as shown on plan.
 2. Guide rail to be custom fabricated or as manufactured by United Showcase Inc, Model WRS-200, or approved equal.
- FFF. Cash Register NIKC
1. This item to be furnished by Owner.
- GGG. Frost top Counter with Display – Quantity as Scheduled.
1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. Full 2 year warranty.
 - b. Self-contained mechanically refrigerated frost top, nominal 30" wide, located as shown on plan.
 - c. 300 series stainless steel.
 - d. Stainless (non-galvanized) steel panels behind laminate.
 - e. 14 gauge tubular frame construction.
 - f. 14 gauge stainless steel top.
 - g. Plastic laminate facing, color as selected by Architect.
 - h. Solid "V" type tray slide.
 - i. Open under storage with shelf.
 - j. 6" high legs with adjustable feet.
 - k. Manufacturer's design style, two-tier display. Configuration to be reviewed and approved by Owner.
 - l. Line up locks.
 - m. Install in banked line-up as shown on drawings.
 - n. 2 Year Warranty
 2. Counter to be as manufactured by Duke Manufacturing, Model 333-25SS, Shelleysteel, Model SCFT-36-NU, or Delfield.
- HHH. Plain Top Counter – Quantity as Scheduled.
1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features.
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. Solid "V" type tray slide.
 - g. Open under storage with shelf.
 - h. 6" high legs with adjustable feet.
 - i. Line up locks.
 - j. Install in banked line-up as shown on drawings.
 - k. 2 Year Warranty

2. Counter to be as manufactured by Duke Manufacturing, Model 311-25SS-MOD, Shelleysteel, Model SC-90-NU-MOD, or Delfield.
- III. Hot/Cold Counter – Quantity as Scheduled.
1. Provide hot/cold food counter module, having the following features.
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. 6” deep mechanically refrigerated cold pan, with adapter bars.
 - g. Pull out refrigeration unit for easy service access.
 - h. Two hot food wells, insulated and thermostatically controlled. With individually valved drains, manifolded to a single valve drain in an operator accessible location.
 - i. Hot wells recessed to hold sheet pans.
 - j. 470 Watt energy efficient heating elements with easy service access.
 - k. Cord and plug set.
 - l. Single service buffet type flip-up sneeze guards. Configuration to be reviewed and approved by Owner.
 - m. Solid “V” type tray slide.
 - n. Open under storage.
 - o. 6” high legs with adjustable feet.
 - p. Line up locks.
 - q. Install in banked line-up as shown on drawings.
 - r. 2 Year Warranty
 2. Counter to be as manufactured by Duke Manufacturing, Model 315-25SS-N7 / E302-25SS, Shelleysteel, Model SH2CR-96-B or Delfield.
- JJJ. Hot Food Display Unit – Quantity as Scheduled.
1. Provide heated display unit having the following features:
 - a. Heat from above.
 - b. Incandescent display lights.
 - c. Heated base with thermostatic controls.
 - d. Three pan model.
 - e. Breath Protector
 - f. Cord and plug.
 - g. 2 Year Warranty
 2. Display warmer to be as manufactured by Hatco, Model GR2BW-42, or approved equal.
- KKK. Ice cream Merchandiser – Quantity as Scheduled.
1. Provide ice cream cabinet having the following features:
 - a. Low temp, low profile glass top merchandiser.
 - b. Manufacturer’s standard finishes.
 - c. Self-contained air cooled refrigeration system, front air discharge, front service.
 - d. Interior lighting.
 - e. Protective front bumper.
 - f. Condensate evaporator

- g. Tempered, heat reflecting glass lids.
- h. Cord and plug.
- 2. Cabinet to be as manufactured by Master-Bilt, Model GT-40, or approved equal.

LLL. Milk Cabinet – Quantity as Scheduled.

- 1. Provide mobile carton milk cabinet having the following features:
 - a. Stainless steel cabinet with vertical corner bumpers.
 - b. Single piece U shaped Stainless steel interior liner for seamless interior wrap.
 - c. Fully insulated.
 - d. Set of 4" diameter swivel casters with brakes.
 - e. Self-contained, air cooled refrigeration system with cord and plug set.
 - f. Cold wall construction.
 - g. Externally mounted dial thermometer.
 - h. Single service.
 - i. 5 year construction warranty.
 - j. 5 year structural body warranty.
- 2. Dispenser to be as manufactured by Defield, Model NFLAC-8, Norlake or Masterbuilt.

MMM. Paper Cup Dispenser – Quantity as Scheduled.

- 1. Provide cup dispenser with the following features:
 - a. Countertop style.
 - b. Three adjustable cup holders.
 - c. Lid compartment.
 - d. Stainless steel construction.
- 2. Cup dispenser to be as manufactured by Dispense Rite, Model BFL-S-3BT, Servend, or approved equal.

NNN. Ice Cream Cabinet – Quantity as Scheduled.

- 1. Provide built-in ice cream cabinet with the following features:
 - a. Air cooled refrigeration system, low temp.
 - b. Self leveling mechanism.
 - c. Lid locking device.
 - d. Install in counter, item 62.
- 2. Unit to be Delfield, Model FFSC-3324, or approved equal.

High School

A. Air Curtain Fan – Quantity as Scheduled

- 1. Provide air curtain fan having the following features:
 - a. Corrosion-resistant exterior with adjustable deflectors and adjustable air intake.
 - b. Electrical characteristics as scheduled.
 - c. Micro-switch for automatic door-actuated on-off control.
- 2. Fan to be as manufactured by Mars Door Company, Model 48CH, Berner, or Leading Edge.

- B. Dunnage Rack – Quantity as Scheduled
 - 1. Provide single deck dunnage platform unit with the following features:
 - a. One piece rotomolded polymer with smooth surfaces, top and underside.
 - b. Slotted deck.
 - c. Arrange as shown on Plan drawings, using quantities and sizes as specified.
 - 2. Platform to be as manufactured by Metro, Model HP223PD, Cambro, or Win-Holt.

- C. Storage Shelving – Quantity as Scheduled
 - 1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal 74” high, numbered at one inch intervals.
 - b. Shelf connects to be wedge lock type with stainless steel corner collar.
 - c. 5 inch diameter. Casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pounds per shelf minimum capacity.
 - 2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam Shelving.

- D. Cold Storage Assembly – Quantity as Scheduled
 - 1. Provide pre-fabricated cold storage room assembly of size and shape shown on plan and detail drawings.
 - 2. Exact overall size to be field verified prior to fabrication.
 - a. Insulation: Panels shall be insulated with 4” thick, injected urethane, expanded using an EPA approved blowing agent, with no high density foam frames of forms in panel. Foam shall be 2.25 lb density, 95% closed cell. Panels shall meet ASTM E-84 (UL-723), be listed by Underwriters Laboratories, and shall comply with applicable portions of Section 2603 of the North Carolina State Building Code.
 - b. Coved Corners: Assembly shall be constructed so that all interior wall, floor and ceiling intersections shall comply with NSF requirements.
 - c. Cam lock fasteners: All panel intersections and wall, floor and ceiling intersections shall be secured by cam lock fasteners.
 - d. Finishes: Exterior and interior finishes shall be shown on drawings.
 - e. Doors: 36” Door size, finish shall be shown on drawings, and shall be furnished complete with sill wiper gasket, lift type hinges. Hinges, latches and hardware shall be chrome plated with 2 adjustable screw type door levelers. Doors to be equipped with spring loaded, non-hydraulic automatic door closers. Freezer door to be equipped with perimeter heat. Exterior door(s) to be equipped with key lock having inside safety release feature. Door handle to include dead bolt, key lock, and padlock functions.
 - f. Thermometers: Each compartment to be provided with exterior flush mounted thermometer mounted at eye level to each door.

- g. Lights: Each compartment to be furnished complete with manufacturer's standard light fixture, having protective cover, mounted and pre-wired to switch with pilot light in door section. Extra lights as needed to provide 30 foot candles 30" above floor. Lights to be furnished and set in place by this section. Light switch must include powered LED thermometer. All fluorescent lights in cooler and freezer to be low temperature.
- h. Ceiling panels: To be one piece, self-supporting and span full width of assembly, with coved corners and edges.
- i. Floor: Integral floor by Food Service Equipment Contractor, with 0.125" aluminum diamond tread finish. The floor and ceiling shall have maximum length panels to span full length of box if possible, otherwise stagger joints so there are no common "four corner" intersections and no joints occurring in doorways.
- j. Refrigeration System Temperature monitoring system with software for remote computer alert and read out. Shall be furnished by owner and installed by equipment supplier as part of a cold storage room assembly, provide each compartment with complete refrigeration system sized to maintain appropriate temperature. Condensing units to be air-cooled, remote, outdoor and placed on a concrete pad. Units to have performance and wiring characteristics as scheduled on drawings. Refrigeration systems to be designed for use with R404A or R-507 refrigerant only. Condensing units to be provided with painted galvanized steel all weather housing, controls, and crankcase heaters, all suitable for outdoor conditions, and located as shown on drawings. Unit coolers to be low silhouette type, mounted at locations shown on drawings. Performance and wiring characteristics to be as scheduled on drawings. Freezer system to be provided with timed electric defrost. Evaporator drain lines to be provided by this section and extend to floor receptors outside assembly. Freezer drain lines to be wrapped with heater cable. Refrigerant piping to be AC copper tubing, hard temper, with wrought fitting and silver solder joints. Insulate suction lines with premolded foamed plastic insulation, thickness as recommended by manufacturer for temperature and application. Refrigeration systems to be provided with all required refrigerant piping, insulation, vibration eliminator, solenoid(s), dryer, suction line filter, expansion valve(s), thermostat(s), heat exchangers, and defrost timers, etc. as necessary for complete installation. Provide pump down control circuit consisting of thermostat and solenoid valve. All components including piping and insulation to be installed using accepted industry standards, manufacturer's instructions and first class workmanship.
- k. Miscellaneous: Assembly to be installed on depressed building slab. See detail drawing. Provide 1/8" diamond tread wainscot along exposed front exterior of assembly mounted from floor to 48" A.F.F. Provide trim strips, closure panels, etc, as necessary to trim assembly to adjacent building surfaces. Provide removable top closure panels with "C" channel rails. Lift-out panel sections to have turn-down edges for strength and are not to exceed 4'-0" in length. Provide clear plastic swinging doors on each opening. Size to suit openings. All materials to be corrosion resistant. Hinges to be gravity type. Doors to be Cool Curtain Clearvu swinging doors, CCI Industries, Inc., Model SS3678 or approved equal. Provide heated pressure relief port in freezer. Provide

sleeves properly located for utility entrance, drain lines, and refrigeration lines, and after lines are installed, fill shelves with spray foam compound, suitable for use in refrigerated spaces. Cold storage room shall be erected by factory trained, or factory approved installers or shall be supervised by factory personnel. Refrigeration systems shall be installed by factory approved personnel. Shop drawing submittal shall indicate who the installer is, and a letter of approval shall accompany the submittal indicating the manufacturer's acceptance of the installers.

- I. This specification does not constitute a complete description of cold storage assembly, also see plan and detail drawings.
 3. Cold storage room assembly to be as manufactured by Norlake, Kolpak, or Bally, complying with specifications and drawings.
- E. Storage Shelving – Quantity as Scheduled
1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal 74" high, numbered at one inch intervals.
 - b. Shelf connectors to be wedge lock type with stainless steel corner collar.
 - c. 5 inch diameter casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pound per shelf minimum capacity.
 2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam-Shelving.
- F. One-Compartment Prep Sink – Quantity as Scheduled
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
 2. Provide one compartment sink with drainboards as follows:
 - a. Approximate overall size: 30" Deep x 84" Long.
 - b. Marine (non-spill) table edges; 8" high backsplash along rear.
 - c. Sink to be 24" x 24" x 14" Deep, creased to drain, with lever waste outlet.
 - d. Drainboard, to right of sink, to be 60" long, shelf under drainboard.
 - e. 14 gauge stainless steel top construction.
 - f. Legs and crossrails to be 1 5/8" diameter stainless steel with adjustable feet.
 - g. Provide T&S B231 faucet.
 - h. 20" x 20" x 5" deep stainless drawer set in s/s channel frame and mount on s/s roller bearings.
 - i. Elevated shelf length of table connected to splash.
 3. Sink to be as manufactured by Select Stainless, Model 7SUB-30-14, Universal, or fabricated equal.
- G. Equipment Stand – Quantity as Scheduled
1. Provide stand with 18 gauge stainless steel top, having the following features:
 - a. 1 5/8" outside diameter stainless steel legs with welded crossrails and set of 5" diameter casters.
 - b. Stand shall have four sets stainless steel channel slides welded to legs, sized to suit 18"x26" pans.

2. Equipment stand to be as manufactured by Delfield/Serv-O-Lift, model 705, Caddy, or Universal Stainless.
- H. Slicer – Quantity as Scheduled
1. Provide slicer having the following features:
 - a. ½ HP motor wired for 120/1 operation, with cord and plug set.
 - b. Adjustable capacity: 12” wide or 7” diameter.
 - c. Adjustable gauge plate up to 1 ¼” thickness.
 - d. Stainless steel knife, 12” diameter.
 - e. Two speed automatic carriage drive.
 - f. Antimicrobial protection built into the external plastic components.
 2. Slicer to be as manufactured by Hobart, Model 2712, Berkel, or Globe.
- I. Mobile Shelf, Four-Tier – Quantity as Scheduled
1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal, 74” high, numbered at one inch intervals.
 - b. Shelf connectors to be wedge lock type with stainless steel corner collar.
 - c. 5” diameter casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pound per shelf minimum capacity.
 2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam-Shelving.
- J. Faucet With Spray Hose – Quantity as Scheduled
1. Provide wall mounted hot and cold water faucet having the following features:
 - a. Nominal 5'-0” long flexible stainless steel hose.
 - b. Self-closing spray nozzle.
 - c. Wall mount mixing valve with integral check valves.
 - d. Vacuum breaker and nozzle hook.
 2. Hose unit to be as manufactured by T&S Brass and Bronze works, Model B-167, Chicago, or Fisher.
- K. Vertical Cutter/Mixer – Quantity as Scheduled
1. Provide tilting vertical cutter/mixer having the following features:
 - a. 2 speed, 6/7 HP motor with pulse switch. Voltage as scheduled, cord and plug.
 - b. 30 QT Stainless steel tilting bowl with straight sides.
 - c. Bowl to be removable for cleaning.
 - d. Safety lid interlock.
 - e. Casters
 2. VCM to be as manufactured by Robot Coup, Model R30T, Hobart, or approved equal.
- L. Ingredients Bins – Quantity as Scheduled
1. Provide polypropylene ingredient bin with the following features:
 - a. Clear polycarbonate removable hinged lid.
 - b. Set of four 4” diameter casters.
 - c. Interior corners coved.

2. Ingredient bin to be as manufactured by Rubbermaid, model 3602, Cambro, or Win-Holt.
- M. Bakers Table – Quantity as Scheduled
1. This item to be custom fabricated in accord with General Requirements of Specifications with plan and detail drawings.
- N. Proofer/ Heater Cabinet – Quantity as Scheduled
1. Provide mobile hot cabinet having the following features:
 - a. Fully sealed 2 gallon water pan in bottom of unit with unexposed element and ball valve drain system.
 - b. Rear air distribution channel for even heat.
 - c. Digital temperature readout and digital programmable controls.
 - d. Push pull handles.
 - e. Voltage characteristics as scheduled.
 - f. Half-height doors, with high tem silicone gaskets and field reversible hinges.
 - g. Stainless steel exterior and interior.
 - h. Top mounted controls and solid state temperature sensors, including food moisture control.
 - i. Fully insulated.
 - j. Capacity up to 35 18x26 sheet pans, up to 36 12x20x2.5 steam table pans.
 - k. High speed fan.
 - l. 6” heavy duty casters with brakes.
 - m. 2 Year parts and labor warranty.
 2. Cabinet to be as manufactured by Royalton model RHHP-VT-C4US, Winston Model HA4522 or FWE.
- O. Stainless Steel Utility Chase – Quantity as Scheduled
1. Provide island utility chase to serve items under exhaust hood, having the following features:
 - a. Stainless steel construction.
 - b. UL Label.
 - c. Designed to include electrical wire way.
 - d. Water tight electrical receptacles to match equipment.
 - e. 1 ½” gas manifold with tees and shut-off valves.
 - f. ¾” hot water and cold water manifold with tees and shut-off valves.
 - g. Gas and water quick disconnects and appropriate cord and plug sets as required by equipment for installation under Division 22, 23, and 26.
 - h. Manual gas shut –off valve for installation under Division 22.
 - i. Length as shown on drawings with utilities coming from above.
 - j. Mount switches for pre-starter and hood lights in end riser, approximately 28” above the floor.
 - k. Note: Cord and plugs must not interfere with placement of equipment. If angled plugs can’t be used, equipment is to be hardwired using elbow at face plate.
 - l. All 120 V receptacles shall be GFCI type if convenience outlet, dedicated receptacles to be single outlet 20 amp.
 2. Utility chase to be as manufactured by Captive-Aire, Model UDI, Avtec, or Select.

- P. Fire Control System – Quantity as Scheduled
1. Provide automatic wet chemical fire control system as required to protect exhaust hood, Item 17, and the cooking equipment located under this hood, and having the following features.
 - a. All tanks, control heads, piping, relays, cable, fusible links, nozzles, elbows, etc., as required for complete system.
 - b. Brass nozzles and chrome plated or sleeved exposed piping.
 - c. Manual strike mechanism in accessible location.
 - d. Installation in accord with NFPA 17A code requirements and coordinate with exhaust hood construction and installation.
 - e. Four contacts for use by EC, one contact for alarm, one for supply fan shut-off, one for shunt trip actuation, and one spare.
 - f. Provide electric gas solenoid valve loose for installation by plumber, and manual reset relay.
 2. Fire control system to be as manufactured by Ansul, Model R-102, Range Guard, or Pyro-Chem.
- Q. Exhaust Hood – Quantity as Scheduled
1. Provide double back island mount type canopy exhaust hood of size, shape, and content as shown on drawings, having the following features:
 - a. All exposed surfaces of 18 gauge 304 Series, 18-8 stainless steel construction.
 - b. NFPA 96 construction, including all joints and seams welded externally, continuous and liquid tight Hood to be tested by approved independent test facility and shall bear the label.
 - c. 5/8" diameter hanger rods to structural ceiling, approximately 48" on center.
 - d. Stainless steel baffle type U.L. classified grease extracting filters, with handles.
 - e. Integral grease gutter sloped to drain to grease receptacle.
 - f. Vapor-proof U.L. listed recessed fluorescent light fixtures.
 - g. Coordinated installation of fire control system as specified for Item 23.
 - h. Integral make-up air plenum along front as shown.
 - i. Provide spacer frame to allow passage of utility chase between hood sections and stainless steel trim on bottom and ends.
 - j. Removable stainless steel perimeter trim and or closure panels from top of hood to ceiling.
 - k. Food service equipment contractor shall provide and install any secondary supporting members required to suspend exhaust hoods. Hood supports shall include seismic bracing, if required, installed in accord with SMACNA guidelines.
 - l. Provide stainless steel cabinet on end of hood for fire control system, and pre-wire package. Switches to be remotely located in riser of stainless steel utility chase.
 - m. Makeup air to be conditioned
 2. Exhaust hood to be as manufactured by Captive-Aire, Model ND-PSP, GreaseMaster, or Avtec.

- R. Convection Oven – Quantity as Scheduled
1. Provide gas fired convection oven having the following features:
 - a. Two sections, stacked.
 - b. Manufacturer's standard finish.
 - c. Rear manifold connection with pressure regulator.
 - d. 90,000 BTU per compartment.
 - e. Set of adjustable stainless steel legs.
 - f. Suitable for use with type of gas at site.
 - g. Back rear motor housing enclosures.
 - h. 2@1/3 HP blower motors, voltage as schedule, with cord and plug sets.
 - i. Porcelain interior liners.
 - j. Multi-pane window in door.
 - k. Electric ignition.
 - l. 2 year warranty.
 2. Convection oven to be as manufactured by Market Garland, Southbend, or Blodgett Forge
- S. Convection Steamer – Quantity as Scheduled.
1. Provide gas fired, 10 pan two-compartment pressureless steamer having the following features:
 - a. ENERGY STAR RATED
 - b. Water management system to limit each compartment to use less than 7 gallons of water per hour.
 - c. Non-stacked pressureless steamer with five-pan capacity per compartment.
 - d. Unit mounted over a 24" wide X 64" tall stainless steel modular base cabinet and frame.
 - e. The compartment powered by independent 42,000 BTU atmospheric, stainless steel, generator with automatic blow down. Not a pour in.
 - f. Each compartment controlled with 60-minute timer and hold feature.
 - g. Built in water filter system with no external plumbing.
 - h. Load compensating timers.
 - i. Single point cold water line connection.
 - j. Electronic ignition.
 - k. Automatic steam shut-off when doors are opened.
 - l. Delimiting ports for each generator.
 - m. Voltage as scheduled.
 - n. 2 year warranty.
 2. Convection steamer to be as manufactured by Market Forge, Model ETP-10G or Groen.
- T. Tilting Skillet – Quantity as Scheduled.
1. Provide gas-fired tilting skillet having the following features.
 - a. Open leg base
 - b. Center based tilt mechanism.
 - c. Capacity of approximately 30 gallons.
 - d. Utility requirements as scheduled.
 - e. Suitable for use with type of gas at site.
 - f. Electric tilt with manual override.

- g. One piece hinged cover.
 - h. Automatic gas shut off when pan is tilted.
 - i. Electric spark ignition.
 - j. Dual pantry fill faucet with swing spout.
 - k. 2 year warranty.
2. Tilting braising pan to be as manufactured by Market Forge, Model 30P-STGL, Groen or Cleveland.
- U. Floor Trough with Grate – Quantity as Scheduled.
- 1. Provide floor trough with removable grate having the following features:
 - a. Fiberglass grate
 - 1) Fiberglass construction with non-slip surface.
 - 2) Suitable for use in Food Service applications.
 - 3) Equivalent to IMC/Teddy Duradek, Model PFG
 - b. Trough
 - 1) 14 gauge 304 18-8 stainless steel, all welded with coved corners and anchor straps, full perimeter flange for installation under grout.
 - 2) Pitch to waste and provide stainless steel cup with removable perforated stainless steel basket.
 - 3) Overall trough size to be approximately 1'6" wide x 3'0" long.
 - 4) See plan for clarification. Coordinate with General Contractor and Plumbing Contractor to assure proper installation.
 - 5) Slope to the drain, flush with surface
 - 2. Grate to be IMC/Teddy Food Service Corp., Model FT-18-36, Serv-O-Lift/Eastern, or Select.
- V. Trunion Kettle – Quantity as Scheduled.
- 1. Provide trunion kettle on modular stand, having the following features:
 - a. Two 24-quart capacity table-top type kettles.
 - b. Manufacturer's standard finishes.
 - c. Mount on stainless steel cabinet to match adjacent equipment.
 - d. Install at location shown on drawings.
 - e. Stainless steel adjustable feet.
 - f. Kettle fill faucet.
 - g. Pressure-reducing valve.
 - h. Self-generating steam generator, gas fired, suitable for type of gas at site.
 - i. Pressure regulator.
 - j. Approved water filter kit.
 - k. Z-Track removable boiler for service.
 - l. 100,000 BTU steam generator.
 - m. 2 year warranty.
 - 2. Trunion Kettle to be as manufactured by Market Forge Model MT6T6G100A, Cleveland or Vulcan.
- W. Combi Oven – Quantity as Scheduled.
- 1. Provide combination convection oven/steamer with the following features:
 - a. Capacity: (12) 12x20x2.5" food pans or (6) 18x26" sheet pans.
 - b. All stainless steel finishes.
 - c. Programmable controls.
 - d. Safety door interlock feature.

- e. Hosable interior, with side mount spray unit.
 - f. Cooking modes: pressureless steam, hot air, or combination of steam and hot air.
 - g. Retherm mode.
 - h. Self-contained steam source.
 - i. Auto drain.
 - j. Manufacturer furnished and approved water filter system.
 - k. Fry baskets.
2. Combination oven steamer to be as manufactured by Rational, Model SCC62, or approved equal.
- X. Worktable with Utensil Rack Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specification and with plan and detail drawings.
- Y. Pan Rack – Quantity as Scheduled.
1. Provide aluminum pan rack having the following features:
 - a. Two level guide supports suitable for use with 18"x26" pans, or 12"x20" pans.
 - b. Capacity: 12@4 7/8" on centers.
 - c. 5" diameter swivel casters, with brakes.
 - d. Horizontal corner bumpers.
 2. Pan rack to be as manufactured by Delfield/Serv-O-Lift, Model RIU-69-12, Cres-Cor, or Kelmax.
- Z. Utility Cart – Quantity as Scheduled.
1. Provide stainless steel welded card having the following features:
 - a. Push handle, with bumpers.
 - b. Two shelves, 14 gauge stainless steel, 650 lb. capacity, 21x33".
 - c. Two 5" diameter swivel casters, two 8" fixed, polyurethane tires.
 - d. Non-marking vinyl corner bumpers.
 2. Cart to be Lakeside, Model 543, Wilder, or Kelmax.
- AA. Worktable – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- BB. Hose Reel – Quantity as Scheduled.
1. Provide open type retractable all-in-one hose reel system having the following features:
 - a. B-1434 reel, open, stainless steel.
 - b. Continuous pressure type vacuum breaker, B-963.
 - c. Shut off control, ORK3.
 - d. MV-0522 spray gun.
 - e. B-131 base faucet.
 - f. 50 feet of heavy duty hose.
 - g. All chrome interconnecting piping.
 - h. Mount on wall at location shown on drawings.
 2. Hose reel assembly to be as manufactured by T&S, with above components Chicago Faucet, or Fisher.

- CC. Equipment Stand, Mobile – Quantity as Scheduled.
1. Provide stand, Robot Coupe R199, Approximately 18"x32"x32"H, with casters. Designed for use with processor.
- DD. Food Processor – Quantity as Scheduled.
1. Provide vegetable processor with the following features:
 - a. Motor base of cast fiberglass and continuous feed housing of cast aluminum.
 - b. Ventilated base.
 - c. 1 ½ HP fan cooled motor.
 - d. Belt drive.
 - e. Magnetic safety switch.
 - f. Push button on off switch.
 - g. Continuous feed head with half moon and round opening with aluminum food pushers.
 - h. Furnish the following blades:
 - 1) 3/16" slicing plate
 - 2) 1/8" medium grating plate
 - 3) 5/16" slicing plate
 - 4) 3/8" coarse grating plate
 - 5) 1/4" julienne plate
 - 6) 3/4" dicing kit
 - i. Include R199 cart, approximately 18"x32"x32"H, with caster designed for use with processor.
 2. Processor to be Robot Coup, Model CL50D, or approved equal.
- EE. Worktable, Mobile – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- FF. Mixer, 30 QT. – Quantity as Scheduled.
1. Provide 20 QT. gear-driven floor model mixer having the following features:
 - a. ½ HP motor, voltage as scheduled.
 - b. 20 QT. stainless steel bowl and dolly.
 - c. Manufacturer's standard finish.
 - d. Attachment hub.
 - e. Stainless steel flat beater, wire whip and dough hook.
 - f. Supplied with Stand.
 2. Mixer to be as manufactured by Hobart, Model A30, Blakeslee, Varimixer.
- GG. Ice Machine with Bin – Quantity as Scheduled.
1. Provide cube ice maker and bin having the following features:
 - a. Ice Maker:
 - 1) Capacity, based on 70 degree F incoming water 90 degree F ambient, of approximately 540 lbs.
 - 2) Self-contained, air cooled.
 - 3) Electrical characteristics as scheduled.
 - 4) Stainless steel housing.
 - 5) Arrange to make dice cube ice.

- 6) Mount ice maker on bin and install at location shown on drawings.
 - 7) Water filter.
 - b. Bin:
 - 1) Bin to have capacity of approximately 1,000 pounds.
 - 2) Stainless steel exterior
 - 3) 6" adjustable legs
 - 2. Ice machine to be as manufactured by Manitowoc, Model SD-1002A, with S-970 bin, Hoshizaki, or Scotsman.
- HH. Pass-Thru Refrigerator – Quantity as Scheduled.
- 1. Provide one-section pass-through refrigerator with top mounted air-cooled condensing unit, exterior digital thermometer, cylinder door locks and top mounted condensate evaporator, having the following features:
 - a. Half-height doors, glass on kitchen side, hinged as showing on drawings.
 - b. Flush mount interior top, no fans to hang into interior.
 - c. Energy Star 2010 Listed.
 - d. 18 months parts and labor, 5 year compressor warranty.
 - e. Programmable digital display.
 - f. Stainless steel exterior and interior.
 - g. Removable, universal type pan slides, both half-door sections.
 - h. Set of adjustable stainless steel legs, with stainless steel toe plate attached pro legs on serving side.
 - i. Stainless steel banking strip.
 - j. Stainless steel trim trip to seal cabinet to adjacent building surfaces.
 - k. Wired for 115/1 operation.
 - l. Install cabinet so that controls face kitchen area.
 - 2. Refrigerator to be as manufactured by Norlake Nova model PR243SSG/0, Victory, or Traulsen.
- II. Pass-Thru Hot Cabinet – Quantity as Scheduled.
- 1. Provide one-section pass-through hot cabinet, having the following features:
 - a. Half-height doors, glass on kitchen side, hinged as showing on drawings.
 - b. Flush mount interior top, no fans to hang into interior.
 - c. Energy Star 2010 Listed.
 - d. 18 months parts and labor.
 - e. Programmable digital display.
 - f. Stainless steel exterior and interior.
 - g. Removable, universal type pan slides, both half-door sections.
 - h. Set of adjustable stainless steel legs, with stainless steel toe plate attached pro legs on serving side.
 - i. Stainless steel banking strip.
 - j. Stainless steel trim trip to seal cabinet to adjacent building surfaces.
 - k. Wired for 115/1 operation.
 - l. Install cabinet so that controls face kitchen area.
 - 2. Manufacturer to match Item HH.
- JJ. Clean Pot Storage Shelf – Quantity as Scheduled.
- 1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:

- a. Uprights shall be nominal 74" high, numbered at one inch intervals.
 - b. Shelf connectors to be wedge lock type with stainless steel corner collar.
 - c. 5 inch diameter. Casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.
 - e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pound per shelf minimum capacity.
2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam-Shelving.
- KK. Dish Cart – Quantity as Scheduled.
- 1. Provide dish and tray cart with the following features:
 - a. Polyurethane material, color as selected by Owner.
 - b. 6" swivel casters, two with brakes.
 - c. Open on one side and top, with molded push handles at each end.
 - d. Two adjustable dividers.
 - 2. Cart to be Cambro, Model TDC30 or approved equal.
- LL. Clean Dishtable – Quantity as Scheduled.
- 1. This item to be custom fabricated in accord with the General Requirements of specifications with plan and detail drawing.
- MM. Rack Dolly – Quantity as Scheduled.
- 1. Provide 20"x20" stainless steel rack dolly, as manufactured by Metro, Model D2020N.
- NN. Item 46 Booster Heater, Gas – Quantity as Scheduled.
- 1. Provide gas booster heater with the following features:
 - a. Stainless steel frame and 5 gallon tank.
 - b. Stainless steel front, top, and legs.
 - c. Six tube type burners.
 - d. 195,000 BTU/Hr input.
 - e. Pressure reducing valve.
 - f. Electrical characteristics as scheduled.
 - g. Inlet temperature gauge/outlet temperature gauge.
 - h. Temperature/pressure relief valve.
 - i. Blended phosphate water treatment system.
 - j. Drain valve.
 - k. Forced draft system with duct to underside of condensate hood. Connections for external air pressure switch.
 - l. Electric ignition.
 - m. Interconnect to exhaust system so booster only operates when fan is running.
 - n. Setup to comply with local codes.
 - 2. Booster to be as manufactured by Hatco, Model CMG230, Hobart, or approved equal.
- OO. Condensate Hood – Quantity as Scheduled.
- 1. Provide single bank wall mount type condensate exhaust hood, having the following features:

- a. All exposed surfaces of 18 gauge 304 series, 18-8 stainless steel construction.
 - b. 5/8" diameter hanger rods to structural ceiling approximately 48" on center.
 - c. Aluminum filter.
 - d. Integral gutter along rear with drain.
 - e. Nominal size, sized as shown on drawings and details.
 - f. Removable stainless steel perimeter trim and or closure panels from top of hood to ceiling.
 - g. Food Service Equipment Contractor shall provide and install any secondary supporting members required to suspend exhaust hoods. Hood supports shall include seismic bracing, if required, installed in accord with SMACNA guidelines.
2. Hood to be as manufactured by Captive-Aire, Model VH-1, Avetco, or Ktech.

PP. Dishmachine, Gas Heated – Quantity as Scheduled.

1. Provide single tank rack conveyor type dishmachine with recirculating pre-wash, having the following features.
 - a. Stainless steel hood and tanks, tall housing.
 - b. Standard finish base and stainless steel adjustable legs.
 - c. Operation as indicated on plan.
 - d. Pre-wash pump motor: Not less than 1HP.
 - e. Wash pump motor: Not less than 2 HP.
 - f. Conveyor motor: Not less than 1/6 HP.
 - g. Gas tank heat, with thermostatic control.
 - h. All components pre-wired to stainless steel control panel, with voltage characteristics as scheduled and with control circuit step-down transformer when required for control voltage.
 - i. Stainless steel condensate hood both ends of machine, with adjustable dampers and stainless steel duct to +4" above ceiling.
 - j. Lower spray arms in pre-wash section.
 - k. Automatic tank fill with manual by-pass.
 - l. Idle pump shut-off feature.
 - m. Ven fan control to turn fan on with machine.
 - n. Include six peg racks, four flat racks, and three bun pan racks.
 - o. Stainless steel splash guards.
 - p. Opti-rinse system to reduce water usage without slowing machine capacity.
 - q. Side loader.
 - r. "Crossfire" washing with 3 upper and lower wash arms, and 4 side wash sprayer arms.
 - s. Color coded curtain designation on outside of dish machine.
 - t. Front mounted washing pumps for easy maintenance access.
 - u. Automatic splash guards.
 - v. Fan and soap connections in control panel.
 - w. Interchangeable scrap bins.
 - x. Raised control panel.
 - y. Stainless steel dual chain drive.
 - z. Easy access cleaning tank.
 - aa. 2 year warranty.
 - bb. Opening and direction of operation must allow for full size sheet pans.

2. Dishmachine manufactured by Insinger Admiral 66-4, Hobart Model CRS66AW, or Champion.
- QQ. Pre-Rinse Unit – Quantity as Scheduled.
1. Provide deck mounted pre-rinse unit having the following features:
 - a. Flexible stainless steel hose.
 - b. Self-closing spray nozzle.
 - c. Wall support bracket.
 - d. Mixing valve with integral check valves.
 2. Pre-rinse unit to be as manufactured by T&S Brass and Bronze Works, Model B-113, Chicago Faucet, or Fisher.
- RR. Disposer – Quantity as Scheduled.
1. Provide disposer with 3HP motor, having the following features:
 - a. Voltage characteristics as scheduled.
 - b. Water cooled.
 - c. Sink adaptor flange to be furnished for welding to sink.
 - d. Auto-reversing control center including, disconnect switch, magnetic starter(s) and start/stop buttons, in stainless steel NEMA 4 enclosure, or better.
 - e. Thermal overload protection either built into motor or in control center.
 - f. Solenoid and vacuum breaker.
 - g. Control center to be mounted out of splash zone, under drain board on stainless steel mounting bracket as shown on details.
 - h. Cast aluminum construction.
 - i. Short neck only as necessary to provide clearance under disposer for cleaning.
 2. Disposer to be manufactured by Salvajor, Model 300-SA-ARSS, Insinkerator, or Hobart.
- SS. Soiled Dishtable – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- TT. Utensil Rail – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- UU. Three Compartment Sink – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- VV. Tray and Silver Stand – Quantity as Scheduled.
1. Provide tray and silver stand with the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 32"L x 31"W x 42"H approximate size.
 - e. Stainless platform base with elevated shelf.
 - f. 5" diameter casters with brakes.
 - g. Silverware dispenser with 7 utensil cylinders in stainless steel holder.
 - h. 2 Year Warranty

2. Dispenser to be as manufactured by Duke Manufacturing, Model TTS-32SS, Shelleysteel, Model SCTS-36-MOD, or Delfield.

WW. Hot Food Counter – Quantity as Scheduled.

1. Provide modular serving counter having the following features:
 - a. 470 Watt energy efficient heating elements with easy service access.
 - b. Full 2 year warranty.
 - c. 300 series stainless steel.
 - d. Stainless (non galvanized) steel panels behind laminate.
 - e. 14 gauge tubular frame construction.
 - f. 14 gauge stainless steel top.
 - g. Five individual hot food wells with pre-wired controls, voltage characteristics as scheduled. Wells to be dry/moist, with individually valved drains, manifolded to a single valve drain in an operator accessible location.
 - h. Hot wells recessed to hold sheet pans.
 - i. Provide custom designer series self-service sneeze guard with 6" intermediate shelf mounted below top of sneeze guard but above hot wells. Configuration to be reviewed and approved by Owner.
 - j. 6" stainless steel legs with adjustable feet.
 - k. Stainless steel ribbed tray slide.
 - l. Cord and plug set.
 - m. Plastic laminate panels, color as selected by Architect.
 - n. Install in banked line-up as shown on drawings.
 - o. Line up locks.
 - p. Open under storage with shelf.
 - q. 2 Year Warranty
2. Hot food counter to be by Duke Manufacturing, Model E305-25SS, Shelleysteel, Model SH-5-NU-MOD, or Delfield.

XX. Cold Food Frost Top Counter – Quantity as Scheduled.

1. Provide Modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Pull out refrigeration unit for easy service access.
 - f. Basic counter section with exterior body panels having plastic laminate facing, and 14 gauge stainless steel top.
 - g. Self contained mechanically refrigerated frost top, nominal 30" wide, located as shown on Plan.
 - h. 2-tier designer style display case over frost top. Configuration to be reviewed and approved by Owner.
 - i. 6" stainless steel legs with adjustable feet.
 - j. Stainless steel inverted "V" tray slide to match adjacent counters.
 - k. Cord and plug set.
 - l. Plastic laminate panels, color as selected by Architect.
 - m. Open under storage
 - n. Install in banked line-up as shown on Drawings.
 - o. 2 Year Warranty

2. Counter to be as manufactured by Duke Manufacturing, Model 334-25SS, Shelleysteel, Model SCFT-60-NU-MOD, or Delfield.
- YY. Corner Counter – Quantity as Scheduled.
1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Open understorage with shelf.
 - f. 6" stainless steel legs with adjustable feet.
 - g. Line up locks.
 - h. Install in banked line-up as shown on drawings.
 - i. 2 Year Warranty
 2. Counter to be as manufactured by Duke Manufacturing, Model ATU-90SS, Shelleysteel, Model SC-MOD, or Delfield.
- ZZ. Counter Top Refrigerator – Quantity as Scheduled.
1. Provide one-section counter top refrigerator with air-cooled condensing unit, exterior dial thermometer, door locks condensate evaporator, having the following features:
 - a. Full-height hinged glass door and fluorescent interior lighting.
 - b. Painted exterior of finish selected by Architect.
 - c. White aluminum interior walls, stainless steel interior bottom.
 - d. Stainless steel 4" adjustable legs.
 - e. Adjustable vinyl coated shelves.
 - f. Voltage as scheduled, cord and plug.
 2. Refrigerator to be True, Model GDM-5, Beverage-Air, or Victory.
- AAA. Plain Top Counter – Quantity as Scheduled.
1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. Full 2 year warranty.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. Plastic laminate panels, color as selected by Architect.
 - g. Solid "V" type tray slide.
 - h. Open understorage with shelf.
 - i. 6" high legs with adjustable feet.
 - j. Line up locks.
 - k. Install in banked line-up as shown on drawings.
 - l. 2 Year Warranty
 2. Counter to be as manufactured by Duke Manufacturing, Model 309-25SS, Shelleysteel, Model SC-50-NU, or Delfield.

- BBB. Beverage/Ice Cream Counter – Quantity as Scheduled.
1. Provide modular serving counter of size and content as shown on plan and detail drawings, having the following features:
 - a. Full 2 year warranty.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. Drain trough and grate.
 - g. Plastic laminate panels, color as selected by Architect.
 - h. Solid “V” type tray slide.
 - i. Die stamped hole(s) in top for utility lines.
 - j. 6” high legs with adjustable feet.
 - k. Install in banked line-up at location shown on drawings.
 - l. Line up locks.
 - m. Provide cutouts and ventilation for Item 75, ice cream cabinet, handle to face customer side.
 2. Counter to be as manufactured by Duke Manufacturing, Model 311-25SS, Shelleysteel, Model SC-84-NU-MOD, or Delfield.
- CCC. Ice Dispenser – Quantity as Scheduled.
1. Provide manual-fill automatic ice dispenser having the following features:
 - a. Approximate capacity of 150 pounds.
 - b. Manufacturer’s standard finish.
 - c. Counter-top style, with integral drain pan.
 - d. Set of 4” high legs.
 - e. Wired for 120/1 operation with cord and plug set.
 - f. Water Dispenser.
 2. Unit to be as manufactured by Cornelius, Model DB90S, Servend, or Follett.
- DDD. Iced Tea Dispenser – Quantity as Scheduled.
1. Provide iced tea dispenser with the following features.
 - a. 5 gallon capacity.
 - b. Stainless steel construction.
 - c. Lid.
 - d. Faucet.
 2. Iced tea dispenser to be as manufactured by Bunn-O-Matic, Model TDS3, or approved equal.
- EEE. Cashier Stand – Quantity as Scheduled.
1. Provide modular cashier counter having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. Two, 2 inch diameter. Holes in top for electrical cords.
 - g. Stainless steel undershelf.
 - h. Convenience outlet under top.

- i. Stainless steel drawer, lockable.
 - j. Solid "V" type tray slide.
 - k. 6" legs.
 - l. Line up locks.
 - m. Install in banked line up as shown on Plan.
 - n. 2 Year Warranty
2. Cashier counter to be as manufactured by Duke Manufacturing, Model 306-25SS, Shelleysteel, Model SCS-36, or Delfield.

FFF. Traffic Guide Rail, Fixed - Quantity as Scheduled.

- 1. Provide stainless steel tubular guide rail as follows:
 - a. 2" diameter tubing.
 - b. Two strand horizontal rails.
 - c. All welded.
 - d. Core anchored in floor at free-standing ends.
 - e. Railing to consist of three straight sections, approximately 7'-0" long, as shown on plan.
- 2. Guide rail to be custom fabricated or as manufactured by United Showcase Inc, Model WRS-200, or approved equal.

GGG. Cash Register NIKC

- 1. This item to be furnished by Owner.

HHH. Plain top Counter with Display – Quantity as Scheduled.

- 1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. Solid "V" type tray slide.
 - g. Open under storage with shelf.
 - h. 6" high legs with adjustable feet.
 - i. Manufacturer's design style, two-tier display. Configuration to be reviewed and approved by Owner.
 - j. Line up locks.
 - k. Install in banked line-up as shown on drawings.
 - l. 2 Year Warranty
- 2. Counter to be as manufactured by Duke Manufacturing, Model 308-25SS, Shelleysteel, Model SC-36-NU, or Delfield.

III. Plain Top Counter – Quantity as Scheduled.

- 1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features.
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. Solid "V" type tray slide.

- g. Open under storage with shelf.
 - h. 6" high legs with adjustable feet.
 - i. Line up locks.
 - j. Install in banked line-up as shown on drawings.
 - k. 2 Year Warranty
2. Counter to be as manufactured by Duke Manufacturing, Model 311-25SS-MOD, Shelleysteel, Model SC-90-NU-MOD, or Delfield.

JJJ. Hot/Cold Counter with Shelf – Quantity as Scheduled.

- 1. Provide hot/cold food counter module, having the following features.
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. 6" deep mechanically refrigerated cold pan, with adapter bars.
 - g. Pull out refrigeration unit for easy service access.
 - h. Two hot food wells, insulated and thermostatically controlled. With individually valved drains, manifolded to a single valve drain in an operator accessible location.
 - i. Hot wells recessed to hold sheet pans.
 - j. 470 Watt energy efficient heating elements with easy service access.
 - k. Cord and plug set.
 - l. Single service buffet type flip-up sneeze guards. Configuration to be reviewed and approved by Owner.
 - m. Solid "V" type tray slide.
 - n. Open under storage.
 - o. 6" high legs with adjustable feet.
 - p. Line up locks.
 - q. Install in banked line-up as shown on drawings.
 - r. 2 Year Warranty
- 2. Counter to be as manufactured by Duke Manufacturing, Model 315-25SS-N7 / E302-25SS, Shelleysteel, Model SH2CR-96-NU or Delfield.

KKK. Hot Food Display Unit – Quantity as Scheduled.

- 1. Provide heated display unit having the following features:
 - a. Heat from above.
 - b. Incandescent display lights.
 - c. Heated base with thermostatic controls.
 - d. Three pan model.
 - e. Breath Protector
 - f. Cord and plug.
 - g. 2 Year Warranty
- 2. Display warmer to be as manufactured by Hatco, Model GR2BW-42, or approved equal.

LLL. Ice cream Merchandiser – Quantity as Scheduled.

- 1. Provide ice cream cabinet having the following features:
 - a. Low temp, low profile glass top merchandiser.
 - b. Manufacturer's standard finishes.

- c. Self-contained air cooled refrigeration system, front air discharge, front service.
 - d. Interior lighting.
 - e. Protective front bumper.
 - f. Condensate evaporator
 - g. Tempered, heat reflecting glass lids.
 - h. Cord and plug.
2. Cabinet to be as manufactured by Master-Bilt, Model GT-40, or approved equal.

MMM. Milk Cabinet – Quantity as Scheduled.

- 1. Provide mobile carton milk cabinet having the following features:
 - a. Stainless steel cabinet with vertical corner bumpers.
 - b. Single piece U shaped Stainless steel interior liner for seamless interior wrap.
 - c. Fully insulated.
 - d. Set of 4" diameter swivel casters with brakes.
 - e. Self-contained, air cooled refrigeration system with cord and plug set.
 - f. Cold wall construction.
 - g. Externally mounted dial thermometer.
 - h. Single service.
 - i. 5 year construction warranty.
 - j. 5 year structural body warranty.
- 2. Dispenser to be as manufactured by Defield, Model NFLAC-8, Norlake or Masterbuilt.

NNN. Paper Cup Dispenser – Quantity as Scheduled.

- 1. Provide cup dispenser with the following features:
 - a. Countertop style.
 - b. Three adjustable cup holders.
 - c. Lid compartment.
 - d. Stainless steel construction.
- 2. Cup dispenser to be as manufactured by Dispense Rite, Model BFL-S-3BT, Servend, or approved equal.

OOO. Ice Cream Cabinet – Quantity as Scheduled.

- 1. Provide built-in ice cream cabinet with the following features:
 - a. Air cooled refrigeration system, low temp.
 - b. Self leveling mechanism.
 - c. Lid locking device.
 - d. Install in counter, item 62.
- 2. Unit to be Delfield, Model FFSC-3324, or approved equal.

PPP. Storage Shelving – Quantity as Scheduled.

- 1. Provide four-tier polymer shelving unit complete with tubular uprights and having the following features:
 - a. Uprights shall be nominal 74" high, numbered at one inch intervals.
 - b. Shelf connectors to be wedge lock type with stainless steel corner collar.
 - c. 5" diameter casters with brakes.
 - d. Shelves shall consist of epoxy wire, stainless steel, or poly covered steel frame with polymer grid decks.

- e. Arrange using quantities and sizes as shown on plan drawings.
 - f. 600 pound per shelf minimum capacity.
2. Shelving to be as manufactured by Metro, Metro-Max Q Series, Eagle Group Lifestor Series, or Cambro Cam-Shelving.

QQQ. Freezer, Step In – Quantity as Scheduled.

1. Provide pre-fabricated cold storage assembly, 4'x6'x7'6" H ACTUAL DIMENSIONS, (not including condensing unit)
 - a. Insulation: Panels shall be insulated with a 4" thick 100% injected urethane with no high density foam frames or forms in panel, expanded with R1416, no CFC's used. Foam shall be 2.25 lb Density, 95% closed cell. Panels shall meet ASTM E-84 (UL-723), be listed by Underwriters laboratories, and shall comply with applicable portions of Section 2603 of the North Carolina State Building Code.
 - b. Coved Corners: Assembly shall be constructed so that all interior wall, floor and ceiling intersections are coved and shall comply with NSF requirements.
 - c. Cam lock fasteners: All panel intersections and wall, floor and ceiling intersections shall be secured by foamed in place cam lock fasteners.
 - d. Finishes: .050 patterned aluminum wall panels.
 - e. Doors: 26" clear opening door. Door shall be furnished complete with sill wiper gasket, lift type hinges. Hinges, latches, and hardware shall be chrome plated with 2 adjustable screw type door levelers. Doors to be equipped with spring loaded, non-hydraulic automatic door closers. Freezer door to be equipped with perimeter heat. Exterior door(s) to be equipped with key lock having inside safety release feature. Door handle to include dead bolt, key lock, and padlock functions.
 - f. Thermometers: Freezer to be provided with exterior flush mounted thermometer mounted at eye level to door.
 - g. Lights: Freezer to be furnished complete with manufacturer's standard light fixture, having protective cover, mounted and pre-wired to switch with pilot light in door section. Extra lights as needed to provide 30 foot candles 30" above floor. Lights to be furnished and set in place by this section. Light switch must include powered LED thermometer. All fluorescent lights in cooler and freezer to be low temperature.
 - h. Floor: Aluminum floor.
 - i. Refrigeration system: Self-Contained, air cooled refrigeration systems, remote outdoor mounted on concrete slab, to maintain 0 degrees Fahrenheit. Evaporator drain lines to be provided by this section and extend to floor receptors outside assembly. Freezer drain lines to be wrapped with heater cable. Temperature monitoring system to be furnished by owner and installed by equipment supplier.
 - j. Miscellaneous: Assembly to be installed at location shown on drawings. Provide plastic strip curtains at door locations, transparent vinyl overlapping strips, aluminum bar hanging rod and bracket, suitable for low temperature application, as manufactured by Curtron, Flextrip Products, or equal. Provide heated pressure relief port in freezer.
 - k. Include two sections of dunnage racks as part of this item. Polymer, Bowtie 22"x36"x12"H.
2. Cold Storage room assembly to be as manufactured by Norlake, Bally or approved equal, complying with specifications and drawings.

- RRR. One Compartment Sink – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- SSS. Worktable – Quantity as Scheduled.
1. This item to be custom fabricated in accord with General Requirements of specifications and with plan and detail drawings.
- TTT. Ventless Hood – Quantity as Scheduled.
1. Provide ventless canopy exhaust hood of size, indicated on plan drawing, having the following features:
 - a. All exposed surfaces of stainless steel construction.
- UUU. Disposer – Quantity as Scheduled.
1. Provide disposer with 1 ½ HP motor, having the following features:
 - a. Voltage characteristics as scheduled.
 - b. Water cooled.
 - c. Sink adaptor flange to be furnished for welding to sink.
 - d. Auto-reversing control center including, disconnect switch, magnetic starter(s) and start/stop buttons, in stainless steel NEMA 4 enclosure, or better.
 - e. Thermal overload protection either built into motor or in control center.
 - f. Solenoid and vacuum breaker.
 - g. Control center to be mounted out of splash zone, under drain board on stainless steel mounting bracket as shown on details.
 - h. Cast aluminum construction.
 - i. Short neck only as necessary to provide clearance under disposer for cleaning.
 2. Disposer to be manufactured by Salvajor, Model 150-SA-ARSS, Insinkerator, or Hobart.
- VVV. Combi Oven – Quantity as Scheduled.
1. Provide combination convection oven/steamer with the following features:
 - a. Capacity: (12) 12x20x2.5" food pans or (6) 18x26" sheet pans.
 - b. All stainless steel finishes.
 - c. Programmable controls.
 - d. Safety door interlock feature.
 - e. Hosable interior, with side mount spray unit.
 - f. Cooking modes: pressureless steam, hot air, or combination of steam and hot air.
 - g. Retherm mode.
 - h. Self-contained steam source.
 - i. Auto drain.
 - j. Manufacturer furnished and approved water filter system.
 - k. Fry baskets.
 2. Combination oven steamer to be as manufactured by Rational, Model SCC62, or approved equal.

WWW. Worktop Refrigerator – Quantity as Scheduled.

1. Provide 48" long refrigerator with the following features:
 - a. Self-contained air-cooled front breathing refrigeration system with condensate evaporator.
 - b. Stainless steel worktop with backsplash at rear.
 - c. Casters.
 - d. Cord and Plug.
 - e. Hinged door front, with lock.
 - f. 36" high.
2. Refrigerator to be Delfield, model ST-4448N, Norlake, or Randell.

XXX. Cook and Hold Cabinet – Quantity as Scheduled.

1. Provide mobile two stack cook and hold oven having the following features:
 - a. Full size with fan.
 - b. Manufacturer's standard finish.
 - c. 5" diameter casters.
 - d. Voltage as scheduled, cord and plug.
 - e. Water vapor control, with relative humidity read out.
 - f. Capacity: (8) 12"x20"x2 ½ pans.
 - g. Stacking hardware.
2. Oven to be Alto Shaam, Model 500-TH11(2)

YYY. Beverage Counter – Quantity as Scheduled.

1. Provide modular serving counter of size and content as shown on plan and detail drawings, having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Drain trough and grate.
 - f. Plastic laminate panels, color as selected by Architect.
 - g. Die stamped hole(s) in top for utility lines.
 - h. 6" high legs with adjustable feet.
 - i. Install in banked line-up at location shown on drawings.
 - j. Line up locks.
 - k. Provide cutouts and ventilation for Item 75, ice cream cabinet, handle to face customer side.
 - l. 2 Year Warranty
2. Counter to be as manufactured by Duke Manufacturing, Model 310-25SS, Delfield or Colorpoint.

ZZZ. Proofer/ Heater Cabinet - Quantity as Scheduled.

1. Provide mobile hot cabinet having the following features:
 - a. Fully sealed 2 gallon water pan in bottom of unit with unexposed element and ball valve drain system.
 - b. Rear air distribution channel for even heat.
 - c. Digital temperature readout and digital programmable controls.
 - d. Push pull handles.
 - e. Voltage characteristics as scheduled.

- f. Half-height doors, with high tem silicone gaskets and field reversible hinges.
 - g. Stainless steel exterior and interior.
 - h. Top mounted controls and solid state temperature sensors, including food moisture control.
 - i. Fully insulated.
 - j. Capacity up to 35 18x26 sheet pans, up to 36 12x20x2.5 steam table pans.
 - k. High speed fan.
 - l. 6" heavy duty casters with brakes.
 - m. 2 Year parts and labor warranty.
2. Cabinet to be as manufactured by Royalton model RHHP-VT-C4US or Winston Model HA4522.

AAAA. Dishwasher with Booster – Quantity as Scheduled.

- 1. Provide automatic undercounter dishwasher having the following features:
 - a. Stainless steel construction, sized to hold 20"x20" dish rack.
 - b. Unit to have built-in booster heater, upper and lower spray arms, wash and rinse dial thermometers, and rinse pressure gauge.
 - c. Voltage as scheduled.
 - d. Approximate capacity: 30 racks per hour.
- 2. Dishmachine to be as manufactured by Insinger, Model RL 30, Hobart Model LXIH or Champion.

BBBB. Hot Food Counter – Quantity as Scheduled.

- 1. Provide modular serving counter having the following features:
 - a. 470 Watt energy efficient heating elements with easy service access.
 - b. 300 series stainless steel.
 - c. Stainless (non galvanized) steel panels behind laminate.
 - d. 14 gauge tubular frame construction.
 - e. 14 gauge stainless steel top.
 - f. Individual hot food wells with pre-wired controls, voltage characteristics as scheduled. Wells to be dry/moist, with individually valved drains, manifolded to a single valve drain in an operator accessible location.
 - g. Hot wells recessed to hold sheet pans.
 - h. Provide custom designer series self-service sneeze guard with 6" intermediate shelf mounted below top of sneeze guard but above hot wells. Configuration to be reviewed and approved by Owner.
 - i. 6" stainless steel legs with adjustable feet.
 - j. Stainless steel ribbed tray slide.
 - k. Cord and plug set.
 - l. Plastic laminate panels, color as selected by Architect.
 - m. Install in banked line-up as shown on drawings.
 - n. Line up locks.
 - o. Open under storage with shelf.
 - p. 2 Year Warranty
- 2. Hot food counter to be by Duke Manufacturing, Model E30-25SS, Shelleysteel Model SCS-36-MOD, or Delfield.

CCCC. Ice Machine with Bin – Quantity as Scheduled.

1. Provide cube ice maker and bin having the following features:
 - a. Ice Maker:
 - 1) Capacity, based on 70 degree F incoming water 90 degree F ambient, of approximately 540 lbs.
 - 2) Self-contained, air cooled.
 - 3) Electrical characteristics as scheduled.
 - 4) Stainless steel housing.
 - 5) Arrange to make dice cube ice.
 - 6) Mount ice maker on bin and install at location shown on drawings.
 - 7) Water filter.
 - b. Bin:
 - 1) Bin to have capacity of approximately 430 pounds.
 - 2) Manufacturer's standard finishes.
 - 3) 6" adjustable legs
 - 4) Cleanable exterior ice scoop holder.
2. Mount ice maker on bin and install at location shown on drawings.
3. Ice machine to be as manufactured by Manitowoc, Model QD-0602A, Hoshizaki, Scotsman, or approved equal.

DDDD. Milk Cabinet – Quantity as Scheduled.

1. Provide mobile carton milk cabinet having the following features:
 - a. Stainless steel cabinet with vertical corner bumpers.
 - b. Single piece U shaped Stainless steel interior liner for seamless interior wrap.
 - c. Fully insulated.
 - d. Set of 4" diameter swivel casters with brakes.
 - e. Self-contained, air cooled refrigeration system with cord and plug set.
 - f. Externally mounted dial thermometer.
 - g. Cold wall construction
 - h. Dual service.
 - i. 5 year compressor warranty,
 - j. 5 year structural body warranty.
2. Dispenser to be as manufactured by Delfield Model NFLAC-8 , Norlake or Masterbuilt.

EEEE. Cashier Stand – Quantity as Scheduled.

1. Provide modular cashier counter having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. Two, 2 inch diameter. Holes in top for electrical cords.
 - g. Stainless steel undershelf.
 - h. Convenience outlet under top.
 - i. Stainless steel drawer, lockable.
 - j. Solid "V" type tray slide, both sides.
 - k. 6" legs.
 - l. Line up locks.

- m. Install in banked line up as shown on Plan.
- n. 2 Year Warranty
- 2. Cashier counter to be as manufactured by Duke Manufacturing, Model 306-25SS, Shelleysteel, Model SCS-36-MOD, or Delfield.

FFFF. Cash Register N.I.K.C

- 1. This item to be furnished by owner.

GGGG. Traffic Guide, Movable – Quantity as Scheduled.

- 1. Provide floor mounted uprights with retractable tape head. Tape to have minimum span of 7'-0" and be slow retracting. Units to be similar to style 890. Verify post finish and tape color with owner. Provide two complete systems at location shown on plan.
- 2. Guide to be Walerence, Tensabarrier, Model 890, or approved equal.

HHHH. Snack Counter – Quantity as Scheduled.

- 1. Provide modular serving counter of size and content as shown on Plan drawings, having the following features:
 - a. 300 series stainless steel.
 - b. Stainless (non galvanized) steel panels behind laminate.
 - c. 14 gauge tubular frame construction.
 - d. 14 gauge stainless steel top.
 - e. Plastic laminate facing, color as selected by Architect.
 - f. Solid tray slides, both sides.
 - g. Enclosed base.
 - h. 6" high legs with adjustable feet.
 - i. Line up locks.
 - j. Install in banked line-up as shown on drawings.
 - k. 2 Year Warranty
- 2. Counter to be as manufactured by Duke Manufacturing, Model 310-25SS, Shelleysteel, Model SC-50-NU.

EXECUTION

After completion of installation, Food Service Equipment Contractor shall present to Owner three sets of all operating and maintenance manuals, covering all mechanically operated equipment furnished under this contract, each set being neatly bound in loose-leaf binder having durable cover.

INSPECTIONS

Pressure vessels for cooking shall be inspected by the N.C. Boiler Bureau.

Refrigeration and air conditioning equipment shall be inspected by qualified inspectors. Contractors shall provide certificates of the above inspections.

Warranty: See Section 01 77 00 for warranty information.

END OF 11 40 00



SPECIFICATION STANDARDS

11 59 00 - STAGE EQUIPMENT

GENERAL

- A. Dance/Drama Area
 - 1. Pipe grid system for lighting shall be furnished and installed by the General Contractor.
- B. Maintain adequate clearances between pipe grid and ductwork.

PRODUCTS

- A. MIDDLE SCHOOLS:
 - 1. FRONT STAGE CURTAIN AND VALANCE
 - a. Flame resistant 25 oz. Velour (color to be selected).
 - b. Curtains to be manufactured with 50% fullness.
 - c. Panel headings shall be box-pleated and constructed with 2 in. heavy jute webbing with a pleat control system consisting of 16 gauge flame resistant virgin vinyl pleat control strips with 4 in. brass grommets placed every 12 in. on center.
 - d. Front curtain panels shall have 12 in. leading and 2 in. trailing hems. Bottom hems of the front curtain panel shall be 6 in. Valance hems shall be 2 in. on the sides and 3 in. on the bottom.
 - e. Valance shall be constructed with hidden vertical seams, i.e., the seams are to fall behind the pleats.
 - f. Panel headings shall be box-pleated and constructed with 2 in. heavy jute webbing with a pleat control system as noted in specification for Front Stage Curtain above.
 - g. Side and rear panels shall have 2 in. side hems and 4 in. bottom hems. Overhead borders shall have 2 in. side hems and 3 in. bottom hems.
 - h. Borders shall be constructed with hidden vertical seams as noted in specification for valance above.
 - 2. FRONT CURTAIN TRACK: ADC 170, or approved equal.
 - 3. SIDE CURTAIN TRACKS: Sturdi-Bilt 390 (Walk-Draw), or approved equal.
 - 4. VALANCE PIPE: If required, shall be 3/4 in. I.D. black steel TC pipe.
 - 5. OVER HEAD BORDER PIPES: shall be 3/4 in. I.D. black steel TC pipe.
- B. HIGH SCHOOLS: Size, design and use of High School stage prevents provision of specifics as to quantity of any type of curtain to be used. Therefore, these guide specifications provide for each type of curtain that might be used.
 - 1. FRONT STAGE CURTAIN AND VALANCE
 - a. Flame resistant 25 oz. Velour (color to be selected).
 - b. Curtains to be manufactured with 60 percent fullness.
 - c. Panel headings shall be box-pleated and constructed with 2 in. heavy jute webbing with a pleat control system consisting of 16

- gauge flame resistant virgin vinyl pleat control strips with 4 in. brass grommets placed every 12 in. on center.
- d. Front curtain panels shall have 12 in. leading and 2 in. trailing hems. Only full widths shall be allowed. Bottom hems of the front curtain panels shall be 6 in. with #8 jack chain encased in flame resistant Repp chain pockets. Valance hems shall be 2 in. on the sides and 3 in. on the bottom, with Kirsch \$1602 weighted tape in the bottom hem.
 - e. All curtains with fullness shade (with hidden vertical seams).
- C. STAGE CURTAIN SYSTEM
1. Shall consist of back traveler, midstage traveler, two (2) rear curtain panels two (2), four (4) or six (6) side leg panels and two (2), three (3) or four (4) overhead borders, depending on stage depth and sight-line situation.
 2. Curtains shall be manufactured with 60% fullness from flame retardant, black Atlas Oxford fabric or similar fabric by another approved manufacturer.
 3. Borders shall be box-pleated and constructed with 2 in. heavy jute webbing with pleat control system as noted in specification for Front Stage Curtain above.
 4. Legs and panels shall have 2 in. side hems and 4 in. bottom hems with #8 jack chain encased in flame resistant Repp chain pockets. Overhead borders shall have 2 in. side hems. Bottom hems shall be 3 in. with Kirsch #1602 weighted tape inside the hems.
 5. Overhead borders shall be constructed with hidden vertical seams as noted in specification for valance above.
 6. Back and midstage travelers shall consist of two (2) panels manufactured with 60% fullness from flame retardant, black color Atlas Oxford fabric or similar fabric by another approved manufacturer.
 7. Panel headings shall be box-pleated and constructed with 2 in. Heavy jute webbing with a pleat control system as noted in specification for Front Stage Curtain above.
 8. Panels shall have 2 in. side hems and 4 in. bottom hems with #8 jack chain encased in flame resistant Rapp chain pockets.
- D. CYCLORAMA: shall be manufactured from flame resistant seamless Muslin fabric (color to be white).
1. There shall be no fullness to this curtain.
 2. Panels shall have a heading constructed with 2 in. heavy jute webbing with 16 gauge flame resistant virgin vinyl control strips with #2 brass grommets placed every 12 in. on center.
 3. The side hems shall be 2 in. and the bottom hem shall be 4 in. with 2 in. heavy jute webbing attached at the top of this hem on the back side of the panel.
 4. This webbing to have #2 brass grommets and tie lines at approximately every 12 in. on center used to fasten a 3/4 in. I.D. black steel TC pipe to the bottom of the panel.
- E. FRONT CURTAIN TRACK: ADC 280A, or approved equal.

- F. BACK AND MID-STAGE TRAVELER TRACKS: ADC 170 or ADC 280A, depending on width and height of panels, or approved equal.
- G. LEG TRACKS: Rotordraper pivot arm #17 with #400C clamp or approved equal.
- H. LEGS: Install on 3/4 in. I.D. black TC pipe.
- I. VALANCE AND OVERHEAD BORDERS: Install on 3/4 in. I.D. black steel TC pipe.
- J. CYCLORAMA: Install single track.
- K. PIPE BATTENS: shall be 1-1/2 in. dia., schedule 40 pipe. Provide in Educational Theaters and in Video Studios.

EXECUTION

- A. TRACK AND PIPE HARDWARE: shall be supported from structure and of adequate design and strength to support curtains.
 - 1. All track and pipe hardware shall be installed by the General Contractor.
- B. CURTAINS: in the theater shall be "dead hung" from the structure.
 - 1. All curtain fabric shall be 25/50 flame/smoke rated.

END OF 11 59 00



SPECIFICATION STANDARDS

11 65 00 - ATHLETIC EQUIPMENT

GENERAL

Gymnasium shall be sized according to the educational specifications.

Ceiling heights shall be 25 ft. clear inside to the bottom of any and all obstructions at high schools and middle schools.

PRODUCTS

- A. **ACOUSTICAL TREATMENT**
 - 1. Provide suitable wall and/or ceiling acoustical treatment at gymnasiums. Acoustical deck may be utilized.

- B. **BASKETBALL BACKSTOPS**
 - 1. Shall be wood, steel, fiberglass or tempered glass for main court and wood at cross-courts at High schools and Middle schools.
 - 2. Auxiliary gyms at High schools and Middle schools shall be glass on main court and wood on side courts.
 - 3. Structural engineer to design support structure.
 - 4. Rims shall be "breakaway" type.
 - 5. Backstops shall be electrically operated with wall key.

- C. **CEILING CONSTRUCTION**
 - 1. Exposed structure ceiling is recommended for use.

- D. **INDOOR SCOREBOARD**
 - 1. Wall mounted electronic type, with time-clock (with one-tenth of a second increment), home and team scores, period, bonus, jump ball, next possession, and possession.
 - 2. Time clock shall be bi-directional with ability to directly set any number of minutes and seconds.
 - 3. Scoreboard shall be compatible for basketball, volleyball, and wrestling. Scoreboard to be similar to Daktronics BB 2101 B. NEVCO and Electro-Mech are equal.
 - 4. Shall be provided at High School and Middle School main gyms.

- E. **FOOTBALL/SOCCER SCOREBOARD**
 - 1. Exterior type with time-clock (with one-tenth of a second increment), team score, horn, period, down, yard-line, yards to go, and possession.
 - 2. Scoreboard to be similar to NEVCO Football LED Model 3514.
 - 3. Shall be provided at High School fields only.

- F. BASEBALL/SOFTBALL SCOREBOARD
 - 1. Exterior type mounted behind the left field fence with team score, inning, ball and strike count and outs.
 - 2. Provide provisions necessary to locate the scorer's table at the home-plate area (wireless controllers are acceptable).
 - 3. Scoreboard to be similar to NEVCO Baseball LED Model 1510.
 - 4. Shall be provided at High School fields only.
 - a. Additional acceptable scoreboard manufacturer: Daktronics
- G. SOCCER AND FOOTBALL GOAL POSTS, AND BASEBALL FOUL POSTS
 - 1. Posts shall be painted over galvanized steel and shall be supplied and installed by Contractor.
- H. VOLLEYBALL FLOOR SLEEVES
 - 1. Provide floor sleeves for volleyball at high school and middle school gymnasiums.
 - 2. Sleeves shall be recessed steel with hinged floor plate.
 - 3. Top of floor plate must be completely encapsulated and shall be flush with wood floor.
 - 4. Floor plates shall be either solid brass or steel with chrome plated finish.
- I. WALL PADS
 - 1. 1 1/2-inch thick, polyurethane foam mounted on 3/8 in. plywood and covered with heavy-duty vinyl covering.
 - 2. Permanently mounted at end walls of all basketball courts, and on all walls in the wrestling rooms.

END OF 11 65 00



SPECIFICATION STANDARDS

12 20 00 - WINDOW TREATMENTS

GENERAL

Window treatments shall be provided by the General Contractor.

PRODUCTS

- A. Type III blinds shall be manufactured in accordance with the standards quality supplied for commercial use.
 - 1. The slats shall be special flexible or tempered aluminum alloy, width 1 in. (25.00 MM) plus/minus 0.003 in. (0.0762 MM).
 - 2. Slat thickness shall be a minimum of 0.0072 in. (0.1829 MM) before painting and a minimum of 0.0082 in. (0.083 MM) after painting.
 - 3. Slats shall have rounded corners with a 1/8 in. (93.175 MM) to 3/16 in. (4.7625 MM) radius.
 - 4. Slats shall have baked colorfast enamel coating of sufficient hardness to resist surface abrasion for the expected life of the blind.

EXECUTION

Allow adequate space at window heads for installation of blinds.

Window treatments shall be installed by the General Contractor.

END OF 12 20 00



SPECIFICATION STANDARDS

12 30 00 - PLASTIC LAMINATE FACED CASEWORK

GENERAL

The section includes information on fixed modular plastic laminate faced casework, components, and countertops.

PRODUCTS

Provide a published catalog with all pre-engineered components illustrated and described.

Minimum of 5 years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project.

- A. Acceptable manufacturers:
 - 1. LSI Corporation of America
 - 2. TMI systems Design Corporation
 - 3. Interior Wood Specialists
 - 4. Pridgen Cabinet Works

- B. SPECIFICATION SUMMARIZATION
 - 1. Hinges - 5 knuckle reveal with 270 degree swing.
 - 2. Door/drawer edge - 3mm high impact PVC extrusion with satin finish.
 - 3. Body edge - 3mm high impact PVC extrusion, match interior of cabinet.
 - 4. Pulls - Bent metal wire, 96mm, epoxy coated.
 - 5. Drawer slides - Blum 230E with epoxy finish 100-lb. load. 3/4 extension
 - 6. File drawers. Blum 230E with epoxy finish 100-lb. load. Full extension
 - 7. Interior finish - unit with open interior, high pressure laminate, thickness:
Thermally
 - 8. Fused Melamine. Closed finish - unit with closed interior, thermally fused melamine.
 - 9. Exposed ends - GP28 laminate.
 - 10. Wall unit bottom - melamine available in dove gray, frosty white or light beige color.
 - 11. Shelf edge - 1mm thick high impact PVC front edge to match shelf color.
 - 12. Toe base -Separate Plywood Base.
 - 13. Locks - Cylinder type cast with 5 disc tumbler mechanism. As shown on drawings
 - 14. Tops - 1 in. particleboard core with GP50 laminate and 3mm edgebanding.
 - 15. Tops at wet areas or areas adjacent to lavatories to receive 1 inch thick moisture resistant particleboard or MR hardwood plywood.

- C. Adhesives and Sealants:
1. All adhesives and sealants, regardless of where they are used, must comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24):
 - a. Wood Glues: 20 g/L
 - b. Millwork and Casework Adhesives: 20g/L
 2. Adhesives used to apply laminates, whether shop-applied or field-applied, shall contain no urea-formaldehyde.

EXECUTION

WARRANTY

All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance.

This is a warranty of replacement and repair only, whereby the manufacturer will correct defects in material and/or fabrication without charge.

END OF 12 30 00



SPECIFICATION STANDARDS

12 31 00 - STORAGE SHELVING

GENERAL

This section includes pre-manufactured metal storage shelving.

PRODUCTS

- A. MATERIALS AND COMPONENTS
 - 1. 22 gauge medium duty box "W" shelving
 - 2. 18" or 24" deep shelf
 - 3. Seven shelf starter
 - 4. 600 lb. capacity
 - 5. 84" high
 - 6. Factory standard finish
- B. FABRICATION
 - 1. For Science Room:
 - a. Fold down front edge **3/4 inch (19 mm)**; fold up back edge **3 inches (75 mm)**. Provide integral stiffening brackets, formed by folding up ends **3/4 inch (19 mm)** and welding to upturned back edge.

EXECUTION

- C. INSTALLATION
 - 1. Install in strict accordance with manufacturer's current instructions and approved shop drawings
 - 2. Anchor all wall units as noted.
 - 3. Secure back to back unit together.

END OF 12 31 00



SPECIFICATION STANDARDS

12 32 16 - INSTRUMENTAL MUSIC EQUIPMENT

GENERAL

This section includes musical instrument storage cabinets for middle schools and high schools.

PRODUCTS

- A. Design system of storage cabinets for musical instruments which will be chip and abrasion resistant under normal usage and will protect instruments and cases from damage under normal use.
- B. Design shelving to withstand continuous use without surface or front edge breakdown.
- C. Acceptable Manufacturers:
 - 1. Wenger Corporation
 - 2. LSI
 - 3. TMI
- D. Instrument Storage Cabinets
 - 1. Cabinet Wall Panel: 3/4 inch thick industrial (cabinet) grade particleboard
 - 2. Grille doors: Welded steel grille construction with powder coat finish
 - 3. Provide clear plastic label holder
 - 4. Hinges - 7mm axle design with self-closing spring or 5 knuckle hinge
 - 5. Locking slide-bolt designed for padlocks, with strike plate

EXECUTION

INSTALLATION: Installation of cabinets and practice rooms will be performed by the manufacturer.

ADJUSTING: Adjust all hardware for smooth operation.

CLEANING: Clean all surfaces of soil.

END OF 12 32 16



SPECIFICATION STANDARDS

12 35 53 - WOOD LABORATORY CASEWORK

GENERAL

This section of the specifications pertains to wood laboratory casework and related equipment at high and/or middle schools.

- A. Laboratory equipment contractor will:
 - 1. Furnish equipment as listed in specifications, equipment schedule and drawings. This includes delivery to the building, setting in place, leveling and scribing to walls and floors.
 - 2. Furnish sinks and sink outlets.
 - 3. Remove debris, dirt and rubbish accumulated as a result of this installation; leaving premises clean and orderly.
 - 4. Furnish and cover installed casework with 4mil. Polyethylene film to protect from soiling until other trades have completed their work.

PRODUCTS

Top is one inch thick, molded from a modified epoxy resin and has optimum physical and chemical resistance.

Color: Black

- A. MATERIALS:
 - 1. Lumber
 - a. Oak lumber is red oak, grade FAS or better, air dried and kiln dried to 6 percent moisture content.
 - 2. Plywood
 - a. Oak plywood is red oak, select grade A-2, plain sliced, vertical grain match, cross banded, and has a solid core.
 - 3. Hardboard
 - a. Hardboard is service tempered and consists of steam-exploded wood fibers, highly compressed into a hard, dense, ¼ inch thick, homogeneous sheet, using natural resins and other added binders.
 - 4. Particleboard
 - a. Particleboard is industrial grade with the following physical properties: Density, 46-50 lbs/cu. ft; modulus of rupture, minimum 2,2psi, modulus of elasticity, minimum 450,000 psi.
 - 5. Glass
 - a. DSB glass is double strength, grade "B" and 1/8 -inch thick.

B. CONSTRUCTION:

1. Components
 - a. Drawer front: 13/16 inch oak lumber
 - b. Drawer sides and back: ½ inch, 9 ply laminated hardwood plywood
 - c. Drawer bottom: ¼ in service tempered hardboard.
2. Casework standard/scientific clad casework with chemical resistant tops.
3. Acceptable manufacturers:
 - a. CambellRhea
 - b. Kewaunee Scientific Corp.
 - c. Collegedale Casework
 - d. Advanced Lab Concepts
 - e. Laboratory Design & Supply
 - f. Fisher-Hamilton

C. Adhesives and Sealants:

1. All adhesives and sealants, regardless of where they are used, must comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24):
 - a. Wood Glues: 20 g/L
 - b. Millwork and Casework Adhesives: 20g/L
2. Adhesives used to apply laminates, whether shop-applied or field-applied, shall contain no urea-formaldehyde.

EXECUTION

The laboratory casework and equipment contractor to coordinate delivery and installation of the product with the General Contractor.

WARRANTY: the casework manufacturer shall warranty the lines of casework to be free from defects in materials and workmanship, under normal use and service, for one year from date of substantial completion.

END OF 12 35 53



SPECIFICATION STANDARDS

12 61 00 - FIXED AUDIENCE SEATING

GENERAL

This section includes fully upholstered chairs with a self-rising seat mechanism.

- A. Submit the following:
 - 1. Product data for each type of product specified. Include installation methods for each type of substrate.
 - 2. Shop drawings showing seating layout, seat numbering scheme, chair sized, and aisle widths.
 - 3. Samples for initial selection purposes in the form of manufacturer's color charts or samples of materials showing the full range of standard colors, finishes, patterns, and textures available for each exposed material.
 - 4. Samples for verification purposes of each exposed material from which seating units and accessories are composed, in each color, finish, pattern, and texture indicated. Include samples of the following:
 - a. Two-Seat Unit: Full size with finishes and accessories specified.
 - b. Upholstery Fabric: Full-width sample, not less than 36 inches long, with specified treatments applied. Show complete pattern repeat. Mark top and right side.
 - c. Molded Plastic: Manufacturer's standard size unit, not less than 3 inches square.
 - d. Number and Letter Plates: Manufacturer's standard with sample letter and number marked.
 - e. Exposed Fasteners: Each type specified.
- B. Maintenance data for seating to include in the "Operating and Maintenance Manual".
 - 1. Methods for maintaining upholstery fabric.
 - 2. Precautions for cleaning materials and methods that could be detrimental to finishes and performance.
- C. Installer Qualifications: Engage an experienced installer who is certified in writing by the seating manufacturer as qualified to install manufacturer's seating.
- D. Fire-Performance Characteristics of Seat Padding: Provide seating that complies with the following:
 - 1. Test Method: California Technical Bulletin 117.
- E. Seating layout: Design and install seating with end standards aligning from first to last row and with backs and seats varied in width, optimizing sightlines.
 - 1. Comply with North Carolina Accessibility Code.

PRODUCTS

- A. Available Manufacturers:
1. Hussey Seating, North Berwick, ME, (800) 341-0401, www.husseyseating.com.
 2. Irwin Seating Company, Grand Rapid, MI, (866) 464-7946, www.irwin-seat.com.
 3. IK, Bonduel, WI, (800) 424-2432, www.ki.com.
- B. Tablet arm: Manufacturer's standard fold-away tablet arm assemblies attached to standard at side of chairs (80% RH, 20% LH, non on aisle side of aisle seats).
1. Provide tablet arms on the entire center section for the first nine (9) rows.
- C. Chair Numbers: Black numbers etched on 5/8" x 1 5/8" anodized aluminum plates.
1. Plates fitted in vandal resistant seat nosing recess secured with two rivets.
- D. Row Letters: Etched 5/8" x 1 5/8" anodized aluminum plates with black numerals.
1. Plates fitted flush and secured with two rivets.

EXECUTION

Environmental conditions: Do not install seating until space is enclosed and weatherproof, wet-work in space is complete and nominally dry, installation of finishes including painting is complete, and other units of work above the ceiling are complete. Do not install seating until ambient temperature and humidity conditions are continuously maintained at final occupancy values.

INSTALLATION:

Follow manufacturer's printed instructions for installation.

Extra Materials: Seat and Back Covers: Furnish a quantity of full-size units equal to 5 percent of the amount installed for each seat size

END OF 12 61 00



SPECIFICATION STANDARDS

12 66 00 - TELESCOPING BLEACHERS

GENERAL

This section provides information about requirements for telescoping bleachers.

PRODUCTS

- A. DESIGN: Shall comply with North Carolina State Building Code, Volume 1.
- B. STRUCTURAL PERFORMANCE: Shall comply with NFPA 102, Chapter 5.
- C. COMPONENTS
 1. Bleacher seats shall be 10-inches deep, contoured seat surface and shall be molded polyethylene plastic.
 2. Risers shall be sheet steel with painted finish, and fully closed plywood footrests.
 3. Decking shall be Group 1, exterior glued, 5/8-inch plywood.
 4. Provide stands with aisles with location and widths as shown on the drawings; aisle shall have intermediate steps as required.
 5. Bleachers shall be wall attached type.
- D. ROW CONFIGURATION: Fabricate rows with 24 inches spacing and 11-5/8-inch rise.
- E. ACCESSIBILITY: Provide cutouts for wheelchair accessible seating at first tier locations.
- F. UNDERSTRUCTURE
 1. Structural steel members shall be of size, spacing and form required to support design loads.
 2. Provide manufacturer's standard non-marring, soft, rubber face wheel assembly under each support column.
- G. OPERATION: Manufacturer's standard system that permits opening and closing of adjacent rows, allow individual and collective rows to be locked open for use, and close with vertical faces of upper skirts in the same vertical plane.
- H. POWER
 1. 1/2 HP, 110.
 2. Coordinate with building electrical system.
 3. Provide manufacturer's standard integral power operation by a series of electric motor driven units mounted under the first rows that apply tractive force to the floor.

4. Provide open and closed limit switches that automatically stop the integral power system when the bleachers reach the fully open or closed positions.
 5. Disconnect shall be easily accessible, outside limits of bleachers.
- I. ACCESSORIES: Provide non-slip aisle treads, intermediate aisle steps, transitional top step, removable aisle handrails, and front railings. Provide Scorer's Table, 8-feet long by 15-inches width; with electrical connection for power and scoreboard at the front face of the first bleacher row.
 - J. LETTERING: Provide self-adhered or mechanically fastened lettering/numbering for bleacher seating.

EXECUTION

- A. PRECAUTIONS: Examine areas where telescoping bleachers are to be installed, for compliance with manufacturer's installation tolerances.
- B. INSTALLATION
 1. Install bleachers to comply with manufacturer's installation instructions and the approved shop drawings.
 2. Provide accessories indicated, including all anchors, fasteners, inserts, and other items required for installing and attaching units to adjoining construction.
- C. ADJUSTING AND CLEANING
 1. Lubricate, test and adjust telescoping bleacher units to operate easily and to comply with manufacturer's specifications.
 2. Clean all exposed and semi-exposed surfaces.
 3. Touch-up shop applied finishes restoring damaged surfaces.
- D. DEMONSTRATION: Engage a factory-authorized service representative to demonstrate and train Owner's maintenance personnel in the operation and maintenance of telescoping bleachers.

END OF 12 66 00



SPECIFICATION STANDARDS

13 34 16 - GRANDSTANDS AND BLEACHERS

GENERAL

This section provides information on middle school and high school grandstands and bleachers.

PRODUCTS

- A. DESIGN: Shall comply with North Carolina State Building Code, Volume 1.
- B. STRUCTURAL PERFORMANCE
 - 1. 100 psf live load, 120 plf seat and tread plank live load, 24 plf seat plank lateral sway load, and 10 plf seat plank perpendicular sway load or current code.
 - 2. Guardrails shall be designed to withstand 100 plf vertical and 50 plf horizontal loads or current code.
- C. UNDERSTRUCTURE: Structural steel members shall be of size, spacing and form required to support design loads.
- D. CONFIGURATION
 - 1. Rise per row, 10-inches; depth per row, 30-inches.
 - 2. Aisles shall be 34 inches minimum width.
 - 3. Design shall meet required distance between seat and footboard as required by code.
- E. ACCESSIBILITY: Provide accessible seating at both the first row and last row of seating as required by code.
- F. COMPONENTS: Aluminum bench seat, 2 by 10. Tread planks, extruded aluminum.
- G. ACCESSORIES
 - 1. Provide non-slip aisle treads, intermediate aisle steps, transitional top step, removable aisle handrails, and front railings.
 - 2. Provide Scorer's Table, 8-feet long by 15-inches width; with electrical connection for power and scoreboard at the front face of the first bleacher row.
- H. Acceptable manufacturers:
 - 1. Southern Bleacher Company
 - 2. All Star Bleachers, Inc.

EXECUTION

PRECAUTIONS: Examine areas where telescoping bleachers are to be installed, for compliance with manufacturer's installation tolerances.

INSTALLATION: Install bleachers to comply with manufacturer's installation instructions and the approved shop drawings.

Provide accessories indicated, including all anchors, fasteners, inserts, and other items required for installing and attaching units to adjoining construction.

ADJUSTING AND CLEANING: Clean all exposed and semi-exposed surfaces. Touch-up shop applied finishes to restore damaged surfaces.

DEMONSTRATION: Engage a factory-authorized service representative to demonstrate and train Owner's maintenance personnel in the operation and maintenance of telescoping bleachers.

END OF 13 34 16



SPECIFICATION STANDARDS

14 24 00 - ELEVATORS

GENERAL

This Section includes hydraulic elevators.

PRODUCTS

- A. Manufacturers: Subject to compliance with requirements, provide hydraulic elevators by one of the following:
1. Fujitec America, Inc.
 2. KONE Inc.
 3. Otis Elevator Co.
 4. Schindler Elevator Corp.
 5. ThyssenKrupp Elevator Group North America.

EXECUTION

Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months full maintenance service. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting.

END OF 14 24 00



SPECIFICATION STANDARDS

21 10 00 - FIRE PROTECTION SYSTEMS

GENERAL

This section includes Fire Protection Systems.

PRODUCTS

- A. Automatic Wet-Type, Class I Standpipe System: Includes NPS 2-1/2 hose connections, has open water-supply valve with pressure maintained and is capable of supplying water demand.
- B. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

EXECUTION

- A. All components shall be listed by Underwriters Laboratories and approved by Factory Mutual for their intended use, as applicable.
- B. The Contractor shall obtain all required approvals from the Authority Having Jurisdiction (AHJ) prior to beginning work, and shall obtain final approvals from the AHJ upon completion.
- C. Fire-suppression standpipe system design shall be approved by authorities having jurisdiction.

END OF 21 10 00



SPECIFICATION STANDARDS

22 05 23 - PLUMBING VALVES

GENERAL

Use one valve manufacturer throughout job, for each type of valve.

PRODUCTS

Where insulation is required, provide extended valve stems.

Compressed air - ball valves, 400 WOG, two-piece construction, full size port.

Swing check valves, 2 in. and smaller, class 125 cast bronze, threaded ends, 2-1/2 in. and larger, class 125, cast iron body, flanged ends.

END OF 22 05 23



SPECIFICATION STANDARDS

22 05 53 - PLUMBING IDENTIFICATION

GENERAL

Use same identification system throughout project.

PRODUCTS

Pipe markers and flow arrows: Stencil paint type

Underground plastic pipe marker: 6 in. wide x 4 mils thick multi-ply tape, solid aluminum foil core between two (2) layers of plastic tape.

Valve tags: 19 gauge polished brass valve tags. Contractor to furnish valve schedule mounted behind glass in a frame located in main mechanical room.

Above ceiling valve markers: 1/2 in. dia. self-adhesive color coded circle.

Color code as noted below.

EXECUTION

- A. Locate pipe markers and flow arrows as follows:
 - 1. Maximum of 25 ft. and closer if congested:
 - a. near each valve
 - b. near each branch
 - c. near equipment
 - d. near origination & termination points
 - e. near where pipe passes through walls (both sides of wall)
 - f. near access doors
- B. Paint and color code all exposed piping in mechanical and boiler rooms. Piping shall have flow arrows and labels located at 10 ft. intervals, at all turns and at each floor or wall penetration and are color coded as follows:
 - 1. Cold Water – Dark Blue
 - 2. Hot Water – Dark Red
 - 3. Gas Lines – Yellow
- C. Provide brass valve tag on all valves.
- D. Provide ceiling valve marker for valves located above lay-in ceilings. Attach valve marker to adjacent ceiling grid.
- E. Provide 1/16 in. plastic laminated signs on all equipment, fastened with stainless steel self-tapping screws. Include equipment identification, capacity, substantial completion date and warranty information.

END OF 22 05 53



SPECIFICATION STANDARDS

22 07 19 - PLUMBING INSULATION

GENERAL

This section addresses plumbing insulation of all domestic water pipes and roof leader piping.

PRODUCTS

Manufacturer: Dow Corning or Owner approved equal.

Fiberglass insulation: ASTM C 547 Class I with Type I all service jacket.

Exposed insulation: 8 oz. canvas rosin sized cloth jacket.

Flame/smoke ratings: flame-spread index of 25 or less and smoke-developed index of 50 or less, as tested by ASTM E84 (NFPA 255) method.

Fittings: one-piece pre-molded PVC fitting covers.

END OF 22 07 19



SPECIFICATION STANDARDS

22 11 13 - DOMESTIC WATER PIPING

GENERAL

This section covers domestic hot water and cold water piping within building to a point 5 ft. outside building.

PRODUCTS

- A. Underground piping: type "K" copper tubing with silver soldered joints. Do not locate joints below slab of building.
- B. Above ground piping: type "L" copper with silver soldered joints.
- C. Piping above 1 1/4 inch line size shall require brazed connection.
- D. Backflow preventer located in building - reduced pressure principle assembly with strainer.
 - 1. Locate between 12 in. and 60 in. above finish floor.
 - 2. Pipe discharge to sloped floor drains.
 - 3. Provide pressure gauges on entering and leaving sides of assembly.
- E. Pressure regulating valve: Provide for all installations. Include strainer, bypass and pressure gauge.

END OF 22 11 13



SPECIFICATION STANDARDS

22 11 16 - POTABLE WATER & FIRE WATER SYSTEMS

PRODUCTS

Underground water service; 2-1/2 in. and less - type "K" copper w/silver solder joints; 3 in and above; ductile iron ASTM C151 with mechanical joints except straight sections may be push - on joints.

END OF 22 11 16



SPECIFICATION STANDARDS

22 13 00 - DRAINAGE AND VENT SYSTEMS

PRODUCTS

- A. Underground Sanitary and Storm Drainage and Vent Piping:
 - 1. Schedule 40 PVC. Standard weight cast iron/ hub & spigot
- B. Aboveground Sanitary and Storm Drainage Piping:
 - 1. Schedule 40 PVC. Standard weight cast iron/ no hub
- C. Aboveground Sanitary Vent Piping:
 - 1. Schedule 40 PVC. Standard weight cast iron/ no hub
- D. Joints:
 - 1. Cemented Joints.
- E. Underground Acid Waste and Vent Piping:
 - 1. Acid resistant Polypropylene pipe schedule 40 flame retardant with socket fittings. Electrical fusion or heat fusion joints.
- F. Aboveground Acid Waste and Vent Piping:
 - 1. Acid resistant polypropylene pipe, schedule 40, flame retardant with socket fittings. Electrical fusion or heat fusion joints.
- G. Cleanouts:
 - 1. Do not install cleanouts in carpet or gym floors
 - 2. Floor cleanouts:
 - a. Exposed rim type, with recess to receive 1/8 in. thick resilient floor finish.
 - b. Exposed flush type, standard non-slip scored or abrasive finish
 - 3. Wall cleanouts: PVC, stainless steel cover.
 - 4. Cleanouts at finish grade: Cast brass plug with recessed slot in fitting or in caulked cast iron ferrule. Set in center of 24 in. x 24 in. x 8 in. thick concrete pad flush with grade.
- H. Flashing Materials:
 - 1. Vent flashing - 16 oz per square ft. sheet copper or 4 lbs. /square ft. sheet lead shop fabricated into one-piece base flashing and separate counter (cap) flashing.
 - 2. Single ply (rubber roof) flashing will be furnished and installed by General Contractor.
- I. Pipe sleeves - schedule 40 black steel.
- J. All Kitchen plumbing to be cast iron.

END OF 22 13 00



SPECIFICATION STANDARDS

22 13 16 - SEWAGE DISPOSAL

PRODUCTS

Use minimum 4 ft. diameter precast eccentric manholes with steps 15 in. on center.

- A. Materials:
1. Ductile iron class 50 with push on joints - ASTM C-150 (8 in. and larger)
 2. PVC ASTM D-3034 SDR 35 on Class I bedding (8 in. and larger)
 3. PVC schedule 40 ASTM, D2665 (4 in. and 6 in.)
 4. Cast iron ASTM A74 hub and spigot service weight (4 in. and 6 in.)

END OF 22 13 16



SPECIFICATION STANDARDS

23 30 00 - HVAC PIPING SYSTEMS

PRODUCT

All piping systems for HVAC systems in buildings shall be schedule 40; black steel with either welded or screwed joints.

Condensate drains from AHU's and fan coil units shall be type "L" copper. PVC drain lines shall not be permitted, except on rooftop equipment requiring drains.

Insulate all drain lines.

Provide unions on both sides of p-trap.

Cold water lines and chilled water/hot water run outs (1 in. and smaller) may be type "L" copper with silver soldered joints.

END OF 23 30 00



SPECIFICATION STANDARDS

23 31 00 - DUCTWORK

GENERAL

All ductwork, supply, return and outside air shall be constructed in accordance with SMACNA standards.

END OF 23 31 00



SPECIFICATION STANDARDS

23 37 13 - DIFFUSERS, REGISTERS AND GRILLES

GENERAL

A complete system of ceiling and sidewall diffusers and grilles for supply, return and exhaust air shall be provided throughout the building.

Perforated diffusers shall not be permitted.

PRODUCTS

The diffusers and grilles shall be constructed of steel with painted surfaces.

END OF 23 37 13



SPECIFICATION STANDARDS

25 09 00 - TIME SYSTEM

PRODUCTS

- A. The time system shall include a transmitter, a roof or window mounted GPS receiver, indicating clocks, and all accessories for complete operation.
- B. Provide:
 - 1. 12-1/2 inch clock at classrooms.
 - 2. 16 inch clock at larger assembly areas. Wire cage at gymnasium locations.

EXECUTION

- A. Deliver all components to the site in the manufacturer's original packaging. Packaging shall contain manufacturer's name and address, product identification number, and other related information.
- B. Store equipment in unopened containers until ready for installation. Store in building in finished, air conditioned space.
- C. Clocks shall not be installed until painting and other finish work in each room complete.
- D. Coordinate installation of GPS receiver with work on the roof or exterior side wall so that the bracket and related fasteners are watertight.
- E. At completion of installation and prior to final acceptance, start up the equipment; assure that all equipment is operating properly, and that all clocks are functioning.

END OF 25 09 00



SPECIFICATION STANDARDS
26 05 00 - WIRES AND CABLES

GENERAL

All conductor material shall be copper.

Aluminum conductors are prohibited.

END OF 26 05 00



SPECIFICATION STANDARDS

26 05 33 - CONDUIT

PRODUCTS

Conduit types shall be rigid steel, IMC, schedule 40 (or heavier) PVC or EMT.

EMT fittings shall be all steel compression type. Cast, pot metal, set-screw or crimp type fittings shall not be permitted.

EMT connectors shall be insulated throat. Plastic bushings may be used in lieu of insulated throat.

END OF 26 05 33



SPECIFICATION STANDARDS

26 26 00 - PANELBOARDS

GENERAL

This section addresses electrical panel boards.

PRODUCTS

All panelboards shall have copper bus with bolt-in breakers.

All panelboards shall be provided with main breakers, even for sub-panelboards that are served from another panelboard except where sub-panelboards are located in the same room as the panelboard serving them.

EXECUTION

See Section 26 00 00 for information regarding transient voltage surge suppression requirements.

Specify typed directories in all panelboards. Room names and numbers in directories shall match final signage used at the site.

Specify screwed on laminated plastic identification labels on cover of all panelboards.

END OF 26 26 00



SPECIFICATION STANDARDS

27 00 00 - COMMUNICATIONS

GENERAL

- A. Local Cable Provider will provide all of Cabarrus County Schools new construction projects with mainline into the designated MDF and provide proper amplification levels to that point only.
- B. The work consists of providing a fully functional CATV system with proper acceptable signal strength on a constant basis to all designated rooms /cable drops as shown on the floor plans of the building.
- C. The following is required:
 - 1. A 6-way tap will be installed off the Local Cable Provider provided mainline/input into the MDF for in-house broadcasting to classrooms.
 - 2. All mainline feeder cable is to be installed where needed and to remote areas of the building to insure proper signal strength.
 - a. Plenum rated cable is required for all locations throughout the building.
 - 3. Install all taps and splitters needed for cable drop connectivity.
 - 4. Terminate and test all installed cable. Test results are to be supplied to the CCS Technology Department.
 - 5. Provide amplification equipment needed to ensure a fully functional CATV system.
 - 6. Provide one (1) year parts and labor warranty that begins upon certificate of occupancy.
 - 7. Provide detailed documentation of all tap and splitter locations on the floor plans to the CCS Technology Department.
 - 8. Provide channel droppers for channels designated by vendor.

END OF SECTION 27 00 00



SPECIFICATION STANDARDS

27 10 00 – STRUCTURED CABLING

VENDOR QUALIFICATIONS

- A. Vendor must be a Network System Integration Company that does network design, networking services, computer hardware sales, and structured cabling, or approved by the Chief Technology Officer of Cabarrus County Schools.
- B. Vendor must have been in business five (5) or more years.
- C. Vendor must hold a current North Carolina contractor license.
- D. Vendor must provide references from five (5) different school districts for projects of a similar size (or larger) or have completed similar successful projects with the CCS or be approved by CCS.
- E. Due to the uncertainty of E-Rate allocations, CCS wishes to proceed with the funded projects. However, should E-Rate funding become available, the Vendor should have experience in and be agreeable to assisting with the filing process and cooperating with CCS in the reimbursement procedure.

PROJECT SPECIFICATIONS

- A. This section describes the proposed products, installation and testing of a Structured Cabling System (SCS) in CCS. The SCS will be designed using the most current edition of EIA/TIA-568-A-1995 (568-A) as the primary guideline.
- B. The design of the SCS will be based on the Reference Standards defined below:
 - 1. ANSI/TIA/EIA-568-B.1, B.2, B.3 – Commercial Building Telecommunications Cabling Standard: General Requirements, Balanced Twisted Pair Components, and Optical Fiber Cabling Components.
 - 2. ANSI/TIA/EIA-569 – Commercial Building Standard for Telecommunications Pathways and Spaces.
 - 3. ANSI/TIA/EIA-606 – Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
 - 4. ANSI/TIA/EIA-607 – Commercial Building Grounding and Bonding Requirements for Telecommunication.
 - 5. ANSI/TIA/EIA-TSB67 – Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems
 - 6. ANSI/TIA/EIA-455 – Standard Test Procedures for Fiber Optic Cables, etc.
 - 7. ANSI/TIA/EIA-526-14A – Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant.
 - 8. ANSI/TIA/EIA-758 – Customer-owned Outside Plant Telecommunications Cabling Standard.

9. IEEE 802.3 and IEEE 802.3z – LAN Ethernet Standard and Gigabit Ethernet Standard.
 10. ISO/IECIS 11801 – Generic Cabling for Customer Premises.
- C. All horizontal cable elements of the SCS will include Category 6 (CAT6) UTP (Unstudded Twisted Pair) plenum cable, raceway, and outlet boxes, cabling pathways and support, patch panels, and equipment racks. The proposed SCS will adhere to all building and electrical codes and follow the ANSI/EIA/TIA-569-1900 (569) “Telecommunications Pathways and Spaces” standard.
 - D. The installation of the SCS will include backbone cables (fiber and copper), horizontal cables, racks. Termination panels, faceplates, wall boxes, surface raceways, firewall penetrations and all miscellaneous hardware required to install the SCS.
 - E. All materials and parts used on this job will be required to meet or exceed CAT6 plenum rated specifications unless noted otherwise. All materials and parts used above the ceiling within a plenum space shall be plenum rated.
 - F. All data lines will utilize CAT6, four (4) pair, Unshielded Twisted Pair (UTP), Plenum cable. All Telecommunications Outlets and/or Connectors (TOCs) in the work areas will be eight position T568B jacks.
 - G. The physical backbone will consist of one (1) 6-strand Multi-mode fiber (IEEE 802.3ae, 50 micron) run originating in the designated Main Data Facility (MDF) and installed to each remote data wiring closet (IDF) from this location.
 - H. End-to-End acceptance testing will be implemented for the entire SCS. Hard copy and soft copy results will be provided as part of the documentation package. All color coding and labeling will be in accordance with ANSI/TIA/EIA-606-1993 (606).

CODES, STANDARDS, AND GUIDELINES

- A. Materials and work specified herein shall comply with the applicable requirements of:
 1. National Electric Code (NFPA 70) including, but not limited to, the following Articles:
 - a. 100 – Definitions
 - b. 250 – Grounding
 - c. 300 – Wiring Methods
 - d. 318 – Cable Trays
 - e. 343 – Nonmetallic Underground Conduit with Conductors
 - f. 346 – Rigid Metal Conduit
 - g. 347 – Rigid Nonmetallic Conduit
 - h. 348 – Electrical Metallic Tubing
 - i. 352B – Surface Nonmetallic Raceways
 - j. 370 – Outlet, Device, Pull and Junction Boxes, Conduit Bodies and Fittings
 - k. 645 – Information Technology Equipment
 - l. 770 – Optical Fiber Cables and Raceways

- m. 800 – Communications Circuits
- 2. American National Standards Institute (ANSI) standards:
 - a. ANSI-C80.2 - Specification for Rigid Steel Conduit, Enameled
 - b. ANSI-C80.3 - Specification for Electrical Metallic Tubing, Zinc-coated
- 3. Telecommunications Industry Association (TIA) standards:
 - a. ANSI/TIA/EIA - 568-B Commercial Building Telecommunications Cabling Standard
 - b. ANSI/TIA/EIA-569-A Commercial Building Standard for Telecommunications
- 4. Pathway and Spaces:
 - a. EIA/TIA - 606-A Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - b. EIA/TIA - 607 Commercial Building Grounding and Bonding Requirements for Telecommunications
- 5. BICSI guidelines:
 - a. BICSI Telecommunications Distribution Design Manual (10th Edition)
 - b. BICSI Customer Owned Outside Plant Design Manual (2nd Edition)
 - c. BICSI Telecommunications Cabling Installation Manual (2nd Edition)
- 6. Underwriters Laboratories (UL) standards:
 - a. UL 6, 2000 Rigid Metal Electrical Conduit
 - b. UL 514B, 1996 Fittings for Conduit and Outlet Boxes
 - c. UL 651, 1995 Schedule 40 and 80 PVC Conduit
 - d. UL 797, 1997 Electrical Metallic Tubing
- 7. National Electrical Manufacturers Association (NEMA) Standards:
 - a. NEMA, RN1, 1998 PVC Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
 - b. NEMA, TC3, 1999 PVC Fittings for use with Rigid PVC Conduit and Tubing
 - c. NEMA, TC6, 1999 PVC and ABS Plastic Utilities Duct for Underground Installation
 - d. NEMA, TC8, 1999 Extra Strength PVC Plastic Utilities Duct for Underground Installation.
 - e. NEMA, TC9, 1999 Fittings for ABS and OVC Plastic Utilities Duct and Fittings for Underground Installation.
 - f. NEMA, TC10, 1999 PVC and ABS Plastic Communications Duct and Fittings for Underground Installation.
- 8. Federal Communications Commission 47 CFR 68
- 9. ADA - Americans with Disabilities Act

PROJECT MANAGEMENT

Installation Schedule

A detailed Installation time schedule will be submitted with the quote. The CCS Construction Manager will determine the start date. It is recommended by the CCS Technology Department that all data/voice contractors visit the job site to do a site

survey and obtain the construction site schedule(s) pertaining to other trades on this job before submitting a bid.

Post-Installation Site Survey

Upon completion of the project, the Vendor's Project Manager will return to the site with a representative from the Owner to do and audit of the installed cabling system. A punch list should be created at this time if the Owner does not approve any work completed by the Vendor.

Documentation Deliverables

Upon completion of the SCS, the following will be provided as network documentation:

1. Floor plan layouts with cable routing and cable identification numbers for the entire building. Existing drawings will be used as a template for this information.
2. Test results for all UTP cable drops and Fiber Optic Backbone cabling.
3. A statement that all materials and equipment meet or exceed all referenced specified standards.

VENDOR RESPONSIBILITIES

Provision

The Vendor will provide all supervision, labor, construction, tools, equipment, hardware and cabling materials as specified; transportation, erection, construction, unloading, inspecting, keeping inventory and returning space or unused material or equipment as specified in the proposal.

Ceiling Tiles

Provide for the removal and damage-free re-installation of ceiling tiles in drop or suspended ceilings as necessary for the installation of all above ceiling cabling and raceways.

Identification

The Vendor will identify to the Owner any work that requires cutting into or through the building structure such as girders, beams, concrete, tile floors or partition ceilings.

Damage

The Vendor will be responsible for and repair of all damage to the building due to negligence of its workmen and will report to the Owner any such damage to the buildings which may exist or occur during the course of the job.

Coordination

The Vendor will coordinate all work with the Owners Coordinator who will be designated before commencement of the installation.

Clean Up

Upon completion of the work each day, all tools, equipment and materials will be stored in a fashion and location agreed upon with the Coordinator. Also trash and debris will be cleaned from the work area such that it is reasonably clean and neat.

Subcontractors

Subcontracting of the work is strongly discouraged. Any subcontractor must meet the approval of CCS. A list of subcontractors must be supplied to the CCS Technology Department for approval within seven (7) days following bid award. CCS reserves the right to reject subcontracting proposals.

As-Built Drawings

No later than two (2) weeks upon completion of the installation, the Vendor will furnish a complete set of floor plan drawings marked to show all modifications in cable routes and termination points for the use in the preparation of as-built drawings.

Cable Assignment Records

Upon completion of the installation, the Vendor will furnish the Owner with a complete set of cable assignment records showing pair assignments and terminations for both copper and fiber cables throughout the installation.

Acceptance Testing

- A. All cables and terminations will be tested, recorded, and supplied to the Owner. All test results will be provided to the Owner within one (1) week of the completion of the Structured Cable System (SCS).
- B. The test procedure and acceptance criteria defined in TSB-67 1995 will be used as a guideline for testing all copper cabling in the SCS. The type of tester that will be used for cable certification is a Level III UTP test manufactured by Fluke or equivalent.
- C. The following tests will be recorded:
 - 1. Wire Map
 - 2. Length
 - 3. Propagation Delay
 - 4. Delay Skew
 - 5. DC Loop Resistance
 - 6. Insertion Loss (Attenuation)

7. Return Loss (RL), RL @ Remote
 8. NEXT, NEXT @ Remote
 9. Attenuation-to-crosstalk Ratio (ACR-N), ACR-N @ Remote
 10. ACR-F (ELFEXT), ACR-F @ Remote
 11. Power Sum ACR-F (ELFEXT), PS ACR-F @ Remote
 12. Power Sum NEXT, PS NEXT @ Remote
 13. Power Sum ACR-N, PS ACR-N @ Remote
 14. Power Sum Alien Near End Xtalk (PS ANEXT)
 15. Power Sum Alien Attenuation Xtalk Ratio Far End (PS AACR-F)
- D. The test procedures and acceptance criteria defined in TIA/EIA-455 will be used as a guideline for testing all fiber optic cabling in the SCS. All fiber optic strands will be tested using a light source and power meter. A bi-directional end-to-end test, at 850nm and 1300nm, will be provided for each cable strand.

Manufacturer Warranty

- E. Upon completion of the structured cabling system, all labor and workmanship of the installed cabling system will be warranted for a period of fifteen years. If installation problems are found with any part of the communication system, the Vendor will correct the problem without charge to the Owner.

GENERAL CONDITIONS

General

Unless specifically stated in a contract resulting from a proposal, the Vendor shall provide and pay for all materials, labor, tools, equipment, transportation, temporary construction of every nature and all other services and facilities of every nature whatsoever, necessary to execute, complete and deliver the work within the specified time. Permits and licenses necessary for the execution of the work shall be secured and paid for by the Vendor.

Any work necessary to be performed after regular working hours, Sunday or legal holidays shall be performed without additional expense to the Owner.

Bonds

A Performance Bond is to be added in the final bid total for this job.

Schedule of Values

Provide a list of principal suppliers and fabricators with site consumption of materials.

Schedule of Work

Provide a schedule of work within one week after the contract is let. The CCS Technology Department will be the designated project manager. And will be the contact for start dates and available hours of work.

Property Protection

The Vendor shall protect all buildings, trees, shrubs, lawns, and all landscaping work from damage. Any property damage by Vendor shall be repaired and replaced at the Vendor's expense.

Changes in Contract

The Owner will not be responsible for any change in the work involving extra cost unless approval in writing is furnished by the Owner before such work is begun. If a change in the project occurs, The Vendor will submit a Project Change Request (PCR) form to the owner.

Existing Conditions

The Vendor is responsible for inspecting the building(s) prior to project startup. No consideration will be given by the Owner to any claims based on the lack of knowledge of existing conditions.

Insurance

Within ten days after notification of the intent to award, a Certificate of Insurance will be furnished to the Owner showing compliance to the following limitations:

- A. The Vendor agrees to comply with the provisions of Workers compensations laws of the State of North Carolina.
- B. It shall be stated on every policy or certificate of insurance that; 'The insurance company agrees that policy No. (XYX) shall not be canceled, changed, or allowed to lapse until ten (10) days after the Owner has received written notice as evidence by return receipt of registered letter, and it is agreed further that as to lapsing, such notice will not be valid if mailed more than fifteen (15) days prior to the expiration date shown on this policy.' The Vendor further shall maintain such other insurance (with limits as shown below) as shall protect the Vendor and Owner from any claims for property damage or personal injury, including death, which may arise out of operations under this contract and the Vendor shall furnish the Owner certificates and policies of such insurance as shown below.
- C. The Vendor, at his/her own expense, will procure the insurance coverage listed below:
 1. Commercial General Liability - \$1,000,000 per occurrence combined single limit for bodily injury liability and property damage liability, including premises and/or operations.
 2. Business Auto Policy - \$1,000,000 each occurrence combined single limit for bodily injury liability and property damage liability, including owned vehicles, hired and non-owned vehicles, and employee non-ownership.

3. Workers Compensation and Employers Liability – coverage for all employees to be the statutory limits in compliance with state and federal laws.

A certificate of insurance verifying both of the above will be sent to the Owner. If requested, prior to the commencement of work.

Workmanship

All work shall be done in a thorough and conscientious manner according to the highest standards of care within the industry and shall be subject to inspection and acceptance by the Cabarrus County Schools Technology Department.

Withdrawal of Proposal

A proposal cannot be withdrawn after it is filed, unless the Owner fails to accept the proposal within sixty (90) days after submission date.

Stored Materials

Any materials stored on the job site shall be the Vendor's responsibility.

Accident Prevention

Precautions shall be exercised at times for the protection of persons and property, and hazardous conditions shall be guarded against or eliminated.

Contract Form

A notice of contract award will be documented on the standard Owner Purchase Order from that will be mailed, or otherwise furnished by the Owner. The delivery of this document will result in a binding contract on both parties.

Indemnification

The Vendor agrees to hold the Owner harmless and to indemnify the Owner from every expense, liability or payment arising out of or through injury (including death) to any person or persons or damage to property (regardless of who the owner may be of the property) of any place in which work is located arising out of or suffered through any act or omission of the Vendor or his Sub-Vendor.

Vendor's Representative

The Owner reserves the right, with sole discretion, to refuse to allow any representative of the Vendor to service the contract in any manner. In this event, the Vendor shall furnish another representative that is acceptable to the Owner.

Regulations

The Vendor and his representatives shall follow all applicable regulations while on the Owners property, including the No Smoking, No Weapons and Drug Free policies. No work shall interfere with the Owners activities or environment unless the Owner gives permission.

Governing Law

All proposed documentation submitted to the Owner is governed under the laws of the State of North Carolina.

END OF SECTION 27 10 00



SPECIFICATION STANDARDS

27 40 00 – AUDIO-VIDEO COMMUNICATIONS

GENERAL

Provide connection of paging cables from paging systems.

END OF SECTION 27 40 00



SPECIFICATION STANDARDS

27 50 00 DISTRIBUTED COMMUNICATIONS AND MONITORING SYSTEMS

INSTRUCTION AND TRAINING REQUIREMENTS

- A. Instruction of owner personnel will be as follows:
 - 1. After final completion, provide instruction to Owner designated personnel on the operation and maintenance of the System.
 - 2. Develop instructional course based on the use of the system and manufacturer's recommendations. Provide a minimum of eight hours of instructions. Arrange course so that operational and maintenance training is performed at distinct times.

- B. Training Requirements
 - 1. Provide training as required herein for this system. System documentation must be provided to Owner prior to system training. Training is to include:
 - a. Detailed training plan that meets approval by the Owner prior to performing said training.
 - b. Practical and comprehensive operation of system.
 - c. Basic system troubleshooting techniques.
 - d. Video of each type of training session provided and furnish two edited copies to the Owner.
 - 2. Training Hours
 - a. Provide each group of users, as defined below, with the minimum training hours as specified.
 - b. Training time is defined as those hours specifically set-aside for the sole purpose of training school personnel. Credit will not be given for time spent providing instructions to owner personnel on a system that has not passed final acceptance. Credit will also not be given for training performed outside of the approved training plan.
 - c. Coordinate all training with Technology Services.
 - d. Unless otherwise noted in a specific section, provide two days (sixteen hours) of training divided into four "block" sessions. The first block session will consist of a four-hour training session and occur when the basic system comes on line. This training session will primarily be intended for the system operators. The second and third block will consist of a four-hour training session and will occur as directed by the Owner. This training session will be for staff development and aimed at the "common user" – teachers and administrators as well as operators. It will be structured so that all users will have the opportunity to attend. The fourth training session will be structured as requested by the Owner. It will occur two months prior to the system warranty expiration date or earlier if requested by the owner. The owner will designate the personnel to attend the training sessions.

These sessions should cover:

- 1) Basic System Configuration and Operation Knowledge.
 - 2) Advance System Configuration and Operation Knowledge.
 - 3) Typical User troubleshooting skills.
 - 4) Basic system troubleshooting skills.
3. In addition to the above training, provide a minimum of four (4) hours of special in-service training for Technology Service personnel. This training will cover the installed cabling plant and other systems. This training may be broken into training sessions which best facilitates the delivery of information.
 4. The Owner reserves the right to establish training times and duration.

END OF SECTION 27 50 00



SPECIFICATION STANDARDS

28 00 00 - SECURITY

STANDARD PRODUCTS

All products specified in this document have been approved by prior North Carolina State approved selection process, unless noted as “or approved equal”.

“Or approved equal” products should meet all requirements as listed and must be approved by submittal to Cabarrus County Schools Technology Services.

Deviations from the specified products are not allowed without prior written approval from Cabarrus County Schools Technology Services and Cabarrus County Schools Purchasing.

CODES, STANDARDS, AND GUIDELINES

- A. Materials and work specified herein shall comply with the applicable requirements of:
 - 1. National Electric Code (NFPA 70) including the following Articles:
 - a. 318 - Cable Trays
 - b. 343 - Nonmetallic Underground Conduit with Conductors
 - c. 346 - Rigid Metal Conduit
 - d. 347 - Rigid Nonmetallic Conduit
 - e. 348 - Electrical Metallic Tubing
 - f. 352B - Surface Nonmetallic Raceways
 - g. 370 - Outlet, Device, Pull and Junction Boxes, Conduit Bodies and Fittings
 - h. 645 - Information Technology Equipment
 - i. 770 - Optical Fiber Cables and Raceways
 - j. 800 - Communications Circuits
 - 2. American National Standards Institute (ANSI) standards:
 - a. ANSI-C80.2 - Specification for Rigid Steel Conduit, Enameled
 - b. ANSI-C80.3 - Specification for Electrical Metallic Tubing, Zinc-coated
 - 3. Telecommunications Industry Association (TIA) standards:
 - a. ANSI/TIA/EIA-568-B – Commercial Building Telecommunications Cabling Standard
 - b. ANSI/TIA/EIA-569-A – Commercial Building Standard for Telecommunications Pathway and Spaces
 - c. EIA/TIA-606-A – Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - d. EIA/TIA-607 – Commercial Building Grounding and Bonding Requirements.

Telecommunications

- A. BICSI guidelines:
 - 1. BICSI Telecommunications Distribution Design Manual (10th Edition)
 - 2. BICSI Customer Owned Outside Plant Design Manual (2nd Edition)
 - 3. BICSI Telecommunications Cabling Installation Manual (2nd Edition)

- B. Underwriters Laboratories (UL) standards:
 - 1. UL 6, 2000 Rigid Metal Electrical Conduit
 - 2. UL 514B, 1996 Fittings for Conduit and Outlet Boxes
 - 3. UL 651, 1995 Schedule 40 and 80 PVC Conduit
 - 4. UL 797, 1997 Electrical Metallic Tubing

- C. National Electrical Manufacturers Association (NEMA) Standards:
 - 1. NEMA, RN1, 1998 PVC Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
 - 2. NEMA, TC3, 1999 PVC Fittings for use with Rigid PVC Conduit and Tubing
 - 3. NEMA, TC6, 1999 PVC and ABS Plastic Utilities Duct for Underground Installation
 - 4. NEMA, TC8, 1999 Extra Strength PVC Plastic Utilities Duct for Underground Installation.
 - 5. NEMA, TC9, 1999 Fittings for ABS and OVC Plastic Utilities Duct and Fittings for Underground Installation.
 - 6. NEMA, TC10, 1999 PVC and ABS Plastic Communications Duct and Fittings for Underground Installation.

- D. Federal Communications Commission 47 CFR 68

- E. ADA – Americans with Disabilities Act

SECURITY CONTRACTOR RESPONSIBILITIES

- A. The Security Contractor (SEC) is responsible for providing materials and installation of all products and systems as described in the Security section of this specification.
 - 1. The SEC is responsible for providing all required equipment to provide GCS with complete and functional systems as specified in this document.
 - 2. It is understood that the SEC shall furnish additional items not mentioned herein to meet requirements as specified without claim for additional payments.
 - 3. The SEC is responsible for submittals, quality assurance, and coordination responsibilities as listed below.

- B. All installations must conform to this specification, manufacturer's specifications and all applicable standards.

- C. If a conflict is found between this specification, the architect's specification, drawings, tables, or any other document related to the project, the greater quantity, quality, or more stringent condition shall be assumed.

Qualifications

- A. The SEC must meet ALL qualifications listed here and any other qualifications as required.
 - 1. All past work for GCS must be certified with no outstanding issues.

Submittals

- A. Prior to proceeding with the work, the SEC shall provide the following submittals to the architect and to GCS Technology Services (number of copies: 6 total, 2 for GCS Technology Services (prefer electronic), 2 for Architect, 2 for CM or Project Manager):
 - 1. Product Data: Include data on features, ratings, and performance for ALL components specified.
 - 2. Shop Drawings: Include dimensioned plan and elevation views of each individual component assemblies, method of field assembly, and workspace requirements.
 - 3. Qualification Data for Installer: Provide letter documenting personnel, projects, and indicating compliance with Installer Qualifications as required.
 - 4. Schedule of Values: Provide a copy of the schedule of values associated with the structured cabling system. The Owner will provide a breakdown of values to be used.
 - 5. Firestop: A drawing showing the proposed firestop system stamped/embossed by the PE (Professional Engineer) shall be provided to the Owner's Technical Representative prior to installing the firestop system.

Permits

The SEC is responsible for obtaining any and all necessary permits required by all local, state, and federal agencies, and having a completed and passed inspection at the completion of work.

Coordination

- A. Pre-Installation Meeting: The SEC shall attend a pre-installation meeting with Engineer, Owner, and Technology Services to discuss issues that pertain to cable plant work.
- B. Construction Progress Meetings: SEC shall attend construction progress meetings once their work begins to intersect with other trades on the construction schedule and prior meetings to establish schedules and installation practices.
- C. Schedule: A schedule is to be provided to the appropriate coordination contact for the work to be performed. Coordination contact could be an associated contractor such as a general or electrical contractor or the Owner depending on how the contract is structured.
- D. Coordinate layout and installation of all equipment and all pathways with other construction, including conduit, piping, and adjacent surfaces. Maintain proper workspace clearances.
- E. Construction conflicts shall be resolved using the RFI (Request for Information) process as prescribed by the architect.
- F. Owner and Technology Services will make periodic quality control inspections for compliance to Contract. Plan to assist the Owner when site inspections are made.

- G. Maintain a competent supervisor and supporting technical personnel, acceptable to the Owner, during the entire installation. Change of the supervisor during the project shall not be acceptable without prior written approval from the Architect/Engineer/Owner.

Cleaning

- A. All work areas shall be left in a clean state at acceptance. Racks and equipment must be wiped free of dust. Cables shall be free of dust. All spaces shall be free from wire, clippings, wrappers, boxes, and other trash related to installation.

Work Included

The work shall include, but not be limited to, the following:

- A. Provide and install Electronic Access Control and Intrusion Detection System interfaced to door hardware provided through a separate contract.
- B. Provide and install Video Surveillance system with software interface to Electronic Access Control System.
- C. Provide programming for both system to work as an Integrated Graphic and Aural Annunciation System.
- D. Provide and Install Cabling Terminations as required
- E. Install components in designated TER and TC racks provided by the Division 27 10 00 Infrastructure Contractor.
- F. Provide system programming, documentation, and training as required.
- G. Providing all labor, equipment, cabling, supplies and materials, and perform all operations necessary for a "TURNKEY" and fully complete installation.

END OF SECTION 28 00 00



SPECIFICATION STANDARDS

28 01 30 - DOOR ACCESS CONTROL SYSTEM

GENERAL

- A. The Door Access Control system consists of a central control unit comprised of a rack mount IP Based Control Unit interfaced to a separate OFE (Owner Furnished Equipment) workstation. All components will be located in TER. The Control Unit utilizes custom software to communicate with remotely located Network Nodes via the Local Area Network.
- B. The Owner will furnish one workstation for Security for remote monitoring of the Door Access Control system.
- C. Remote Network Nodes will be located in TC locations and communicate with Door Interface Panels which are in turn interfaced to RF/Proximity integrated locksets located on selected doors. All other exterior doors utilize a center hinge based DPS (door Position Switch) which connects directly to the Network Node. The Door Control Panels, card readers, and door position switches are provided through a separate contract.
- D. Authorized Personnel will enter information into the system database regarding people who will have access rights and which doors they will have access rights to. That information will be downloaded to the door control units for real-time operation. The door control units will store all activities and down load their logs to the central control unit for archiving. The central control unit will be able to generate various reports regarding use of the system. The central control unit will also be able to place doors in alarm mode or remove them from alarm mode status based on a preprogrammed time frame or real-time commands from the central control unit.
- E. The IP Based Control Unit will function as the Graphic Display/Alarm Annunciation System providing a graphical view of the facility and identify icons located on the graphics display associated with every alarm point in the Electronic Security System. The system will also interface with the Electronic Surveillance package for coordination of camera images with alarm points. The system will be able to:
 - 1. Integration of all software modules, Access Control, Video Management, and Alarm Monitoring, into a single program.
 - 2. Utilize the alarm inputs to and from the Electronic Surveillance package and all other security devices and provide alarm event logging and reporting.
 - 3. Utilize alarm outputs to provide reset functions for all other security systems.
 - 4. Direct import of facility map in DXF drawing format.
 - 5. Supports live on-screen, in-window PTZ video display
 - 6. Supports multiple GUI workstations via PC Network

- F. The system is an embedded, multi-threaded web server using the Linux operating system and a fully distributed ODBC compliant database. The unit's web based API uses XML formatted commands sent to its remote nodes with standard HTTP calls and provides complete control and programming of all system features.
- G. Site maps or other drawings are easily loaded directly into the GUI where they can be "seeded" with special "link icons". The device icons can be selected from predefined tool bar and dropped onto the drawing. Icon configuration menus are then presented allowing labeling of the icon and quick association of the icon with a hardware device. The installer may also drag and drop configured devices directly from tables provided in the software module. Those tables represent a fully integrated user-friendly spreadsheet-like interface for entering video systems camera titles, sequences, sequences, alarm responses, and other configuration features. This contractor will be responsible for the import and initial setup/population of the graphical maps.
- H. The configuration tables within the module will be internally "linked" to the map system. The titles of camera icons on the maps are automatically changed when corresponding entries are made to the camera table. Correspondingly, the table entry for a particular device icon can be called automatically into view with simple mouse click on the icon. All functions of the video switcher/control unit, including PTZ system control are fully operational via the graphical control panel.
- I. The system will be capable of processing "Remote Alerts" for "Non-Operating Hour" alerts. Alarms occurring during the period of time determined as "Non-Operating Hours" will process an alert to the District E-Mail server. In turn, the server will alert the on-call District employee via a District issued pager. Dependent upon the employee home having DSL or Cable Modem access, the system will allow that user to utilize a VPN tunnel into the system from their home to review the alarm event. That employee will either "Clear" the alarm from their home or contact the local Law Enforcement Agency to alert them to an Alarm condition at the site requesting their response.
- J. This contractor will coordinate their work with the existing Door Hardware contractor on site. This will include a site coordination meeting to confirm the specific door number and locations coordinated with the Remote Nodes located in Wiring Closets throughout the facility.

END OF SECTION 28 01 30



SPECIFICATION STANDARDS

28 01 50 - VIDEO MONITORING SYSTEM

GENERAL

- A. Interior and exterior IP cameras will be located throughout the facility and interconnected to the Security Video Server via the building wide Local Area Network. The system will be capable of managing, controlling, and recording up to one hundred and twenty-eight cameras. All cameras will have owner defined location titles superimposed on their respective images.
1. The building exterior is covered with pan/tilt devices that will be programmed to continuously scan their respective coverage areas or during After Hours, move to a preset which enables the camera to cover from its location to the bottom of the next perimeter camera location.
 2. Ceiling mounted and wall mounted camera domes containing cameras will be strategically located in the hallways and major corridor entrance. Those cameras will be interfaced with the DACS (Door Access Control System) through the SVS (Security Video Server). An alarm from one of those systems will cause the Video Monitoring system to position a related camera to the alarm area, display the camera on the Security Room monitors, and initiate video recording of the event.
 3. An interior or exterior camera will be associated with every door that is controlled through the Door Access Control System. Upon alarm of an unauthorized opening of the door will cause the Electronic Surveillance system to display the related camera on the main Security Room monitor and initiate video recording of the event. The school has the option to record in single frame mode every use of all or specific controlled door.
 4. The Security Video Servers with their associated server software will be located in TER. The servers will receive input from all interior and exterior cameras, switch those cameras between a monitoring function or alarm function, and provide pan/tilt/zoom control of all cameras with those capacities. All features of the system will be fully integrated into the DACS controller acting as the integration controller for the total system.
 5. The Owner will furnish two dedicated workstations with 22" LCD panels for Security. Enabling continuous, simultaneous, real-time viewing of a MAXIMUM of twenty-four camera locations (with possible sequencing) at one time through the use of the remote client software function in the Video package. In alarm mode, the multi-window sequenced signal will be replaced with a full screen display of the camera related to the alarm location.
 6. Additionally, the system will receive control signals from the DACS related to the Intrusion Detection System. The system will be programmed to react to alarms from those systems in a specific manner and display the alarmed area on the Security Monitor and start recording of the event on the Security Video Server.
 7. Provide software, as required, to enable District monitoring locations to view DACS and Electronic Surveillance events in real-time or playback mode through the school Local Data Network and District Wide Area Network.

END OF SECTION 28 01 50



SPECIFICATION STANDARDS

28 07 00 PROGRAMMING OF ELECTRONIC SAFETY AND SECURITY

GENERAL

- A. This contractor will be responsible for the initial set up and programming of the Electronic Security Systems as specified herein. The initial set-up and programming will include the following
 - 1. Prior to initial programming of the system the contractor will meet with CCS Technology Services and the building Principal (and their team if applicable) to review the capabilities of the Electronic Surveillance System.
 - 2. Based upon the review sessions, the contractor will document in writing the operational parameters, and text response if applicable, for the Electronic Surveillance systems as requested. The contractor will submit that program description to CCS Technology Services for review and approval.
- B. The contractor will provide programming and support to meet the operational parameters of the system as outlined in the Owner Security Program Document.
- C. The contractor will provide three copies of the system configuration files, including graphic maps and interaction functions, and provide those copies to the Owner.
- D. The contractor will provide ONE additional assessment/programming days (Eight man hours) as part of their proposal to be delivered within the first year of beneficial use of the system. Within no less than six month of first beneficial use of the system and prior to the first anniversary of beneficial use (or at the discretion of the Principal), the contractor will schedule an assessment meeting with the Principal and his team to determine if the operational parameters of the system meet their needs. The contractor will document any requested changes, update the Owner Security Program Document, and revise the system program to meet the changes as requested.

END OF 28 07 00



SPECIFICATION STANDARDS

28 08 00 COMMISSIONING OF ELECTRONIC SAFETY AND SECURITY

GENERAL OVERVIEW OF COMMISSIONING METHODOLOGY

- A. Every system and component as specified herein will be verified and tested for correct installation and operational parameters. Completion of the process as defined herein will place the project into "Substantial Completion" status. The contractor for each system contained herein shall provide the following.
- B. Confirm that each door operates correctly based on the installation of:
 - 1. Integrated lockset
 - 2. Electric latch with latch DPS
 - 3. Door leaf with DPS
 - 4. Individual cardreader
 - 5. All components and properly interfaced to the access control system and the system provides logging of all actions.
- C. Confirm the following for each camera.
 - 1. Dome or housing is clean, without smudges or fingerprints from installation.
 - 2. All cameras are properly oriented to their respective coverage area.
 - 3. Fixed lens cameras are properly focused for their respective coverage area.
 - 4. Documentation for each component.

VERIFICATION TEST REPORT

Upon substantial completion of each system, a contractor representative will test all features of the system at every location of the system within the facility for operational requirements as defined in the systems respective section.

Document, on a contractor generated form, the compliance of every location and the testing individual(s) will initialize the results of each location test. Submit a written report detailing the result of initial adjustments and verification tests including all relevant drawings, charts, and photographs.

This report shall be completed and submitted to the Owner for review at least five (5) days prior to acceptance testing.

ACCEPTANCE TESTING

- A. The Acceptance Testing will be facilitated and performed by the Contractor in the presence of the Owner and Consultant. Coordinate this period so that free access, work lighting and electrical is available on the site. Acceptance Testing

will confirm 10% of the total system locations and functions as reported by the Contractor in their Verification Test Report

1. Provide testing equipment and required in the commission of each system and make it available at all times, on site, during the testing period. Prior to the testing appointment, provide to the Owner a listing of the specific equipment to be made available.
2. Be prepared to verify the performance of any portion of the system by demonstration, viewing tests, and instrumented measurements.
3. Should the contractor schedule an Acceptance Test and the system or components are not ready for or fail Acceptance Testing, the contractor will pay for all subsequent trips and man-hours required for the Consultant to properly document specification conformance by the contractor. The Owner will have the right to reduce pay requests or final application of payment to the contractor in an amount equal to the travel costs and man-hours expended by the Consultant and charged to the contractor. The Owner would then pay the Consultant from the funds withheld from the contractor.
4. Upon witness of the Acceptance Testing and the determination, in the Owner's opinion, that the Contractor has falsified the Verification Test Reports, the Owner has the right to hire an Independent Testing Agency to provide outside verification of the results. Falsification of the test results is defined as cables shown as testing correctly in the Verification Report that fail during the Acceptance Testing. (The Contractor has the right to hire an Independent Testing Agency approved by the Owner directly.) Furthermore, the Owner will have the right to reduce pay requests or final application of payment to the Contractor in an amount equal to the travel costs and man-hours expended by the Independent Testing Agency and Consultant and charged to the contractor. The Owner would then pay the Independent Testing Agency and Consultant from the funds withheld from the contractor.

END OF 28 08 00



SPECIFICATION STANDARDS

28 13 00 - ACCESS CONTROL

GENERAL

- A. This section includes specifications for an electronic access control system.
- B. Abbreviations and Acronyms
 - 1. TCP/IP: Transport control protocol/Internet protocol incorporated into Microsoft Windows.
 - 2. UPS: Uninterruptible power supply.
 - 3. WAN: Wide area network.
 - 4. RF: Radio frequency.
 - 5. I/O: Input/Output.
 - 6. LAN: Local area network.
 - 7. LED: Light-emitting diode.
 - 8. CPU: Central processing unit.
 - 9. ACS: Access control system.
 - 10. CCTV: Closed-circuit television.
- C. Definitions
 - 1. ABA Track: Magnetic stripe that is encoded on track 2, at 75-bpi density in binary-coded decimal format; for example, 5-bit, 16-character set.
 - 2. Central Station: A PC with software designated as the main controlling PC of the security access system. Where this term is presented with initial capital letters, this definition applies.
 - 3. Controller: An intelligent peripheral control unit that uses a computer for controlling its operation. Where this term is presented with an initial capital letter, this definition applies.
 - 4. Credential: Data assigned to an entity and used to identify that entity.
 - 5. DTS: Digital Termination Service: A microwave-based, line-of-sight communications provided directly to the end user.
 - 6. File Server: A PC in a network that stores the programs and data files shared by users.
 - 7. Identifier: A credential card, keypad personal identification number or code, biometric characteristic, or other unique identification entered as data into the entry-control database for the purpose of identifying an individual. Where this term is presented with an initial capital letter, this definition applies.
 - 8. Location: A Location on the network having a PC-to-Controller communications link, with additional Controllers at the Location connected to the PC-to-Controller link with RS-485 communications loop. Where this term is presented with an initial capital letter, this definition applies.
 - 9. PCI Bus: Peripheral component interconnect; a peripheral bus providing a high-speed data path between the CPU and peripheral devices (such as monitor, disk drive, or network).
 - 10. ROM: Read-only memory. ROM data is maintained through losses of power.

11. RS-232: A TIA/EIA standard for asynchronous serial data communications between terminal devices. This standard defines a 25-pin connector and certain signal characteristics for interfacing computer equipment.
12. RS-485: A TIA/EIA standard for multipoint communications.
13. WAV: The digital audio format used in Microsoft Windows.
14. Wiegand: Patented magnetic principle that uses specially treated wires embedded in the credential card.
15. Workstation: A PC with software that is configured for specific limited security system functions.

D. Reference Standards

1. FCC: All assemblies shall be in compliance with FCC emission standards.
 - a. Microprocessor based controller: Part 15, Subpart F, Class A.
 - b. Proximity Card Reading Sensors: Part 15, Subpart F (field disturbance sensors).
 - c. Dial-up modems: Part 68
2. 2000 International Fire Code
3. American National Standards Institute (ANSI)
4. NFPA 70 (1999) National Electric Code International Organization for Standardization (ISO)
5. NEMA: Electrical equipment shall comply with applicable portions of NEMA.
6. Underwriters Laboratories (UL)
 - a. UL-1012 and CSA: All power supplies shall be in compliance with Underwriters Laboratories standard 1012 and CSA standards for power supplies.
 - b. UL-294: The system shall comply with Underwriter Laboratories standard 294 for Access Control Systems.
7. All applicable state and local codes

E. Qualifications

1. Manufacturer:
 - a. Manufacturer of products defined in this section shall have at least 10 years experience in manufacturing and servicing access control and management systems.
 - b. Manufacturing process of company shall meet standards of ISO 9001 Certification.
2. Supplier:
 - a. Obtain Central Station, workstations, Controllers, Identifier readers, and all software through one source from a single manufacturer.
3. Installer / Systems Integrator Qualifications:
 - a. An employer of workers trained and approved by manufacturer.
 - b. Company with a minimum of 5 (five) years system design, engineering supervision, and installation experience in the alarm or access control industry.
 - c. Company that is trained, authorized, and certified to install the specified products.
 - d. Company has local coverage for all sites included in this section qualified to service the products being installed.
 - e. Service facility: Systems Integrator shall have service facilities within 50 miles of the installation.

4. Testing Agency
 - a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PRODUCTS

MANUFACTURERS

- A. Subject to compliance with project requirements, manufacturer's offering Products which may be incorporated in the Work include the following:
 1. Access Control System Hardware/Firmware/Software:
 - a. Schlage Electronic Security
 - b. No Substitutions
 2. Power Supplies:
 - a. Schlage Electronic Security
 - b. No Substitutions
 3. Credentials & Readers:
 - a. Schlage Electronic Security
 - b. No Substitutions
 4. Remote Key Switches & Request-to-Exit Buttons:
 - a. Schlage Electronic Security
 - b. No Substitutions
 5. Door Position Switches/Contacts:
 - a. Schlage Electronic Security
 - b. Approved Equal
 6. Request-to-Exit Motion Sensors:
 - a. Schlage Electronic Security
 - b. Approved Equal
 7. Electric Horns, Door Alarms, Strobes:
 - a. Schlage Electronic Security
 - b. Approved Equal

ACCESS CONTROL SYSTEM REQUIREMENTS

- A. General Access Control System Description:
 1. The Access Control System's primary function is to regulate access through specific portals to secured areas and provide security functions noted in this Section.
 2. The ACS shall utilize card technology as its primary access device but will support other input technologies at each door.
 3. SURGE AND TAMPER PROTECTION:
 - a. Surge Protection: Protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor-entry connection to components.
 - b. Tamper Protection: Tamper switches on enclosures, control units, pull boxes, junction boxes, cabinets, and other system components

shall initiate a tamper-alarm signal when unit is opened or partially disassembled. Control-station control-unit alarm display shall identify tamper alarms and indicate locations.

- B. General Access Control Software Description:
 - 1. The ACS Software shall be expandable to meet all criteria noted in Sections 2.5 through 2.9 of this document.
 - 2. The ACS Software shall include all options to accommodate all devices in the construction documents.
 - 3. The ACS Software shall include applications to accommodate the following functions:
 - a. The ACS shall consist of a PC-based Central Station and will allow 1 concurrent client logged in at that station.
 - b. The ACS shall allow users to manage and support off-line doors including, but not limited to, computer managed stand alone locks.
 - c. The ACS shall allow users to manage and support off-line doors including, but not limited to, "hotel style" stand alone locks.
 - d. The ACS shall include an integrated (single database) digital photo identification system.
 - e. The ACS shall include integrated digital video transaction retrieval software. Such software shall include direct links from the ACS alarm and transaction monitoring applications.

- C. General Access Control Hardware Description:
 - 1. The ACS Hardware shall be expandable to meet all criteria noted in Section 2.4 of this document.
 - 2. The ACS Hardware shall include all options to accommodate all devices in the construction documents.
 - 3. The ACS Hardware shall include devices to accommodate the following functions:

- D. Internal System Security Provisions:
 - 1. Supervised Wiring: Selected field wiring shall be supervised. Cutting, shorting, or altering connections of any wire listed as supervised below, shall be detected, and activate an alarm condition at system workstations. Provide wiring supervision for the following functions:
 - a. Tamper Switches.
 - b. Door Position or Contact Switches.
 - c. Panic/Duress Alarms.
 - d. Other intrusion detection/alarm input devices, as defined herein and indicated on the Drawings.
 - 2. Provide signs or labels for all tamper monitored enclosures warning that an alarm will sound if access is attempted, and giving the telephone number of the security workstation operator.
 - 3. Access Control System head end shall be interfaced with the CCTV system head end to cause automatic call up (via ASCII text string). Upon alarm or selected event condition, the access control system shall cause the CCTV system to automatically call up the camera image associated with the alarm or event point or location.
 - 4. Interface with the Fire Alarm System: The ACS shall be programmed so that relay output contact(s) from the fire control panel will be capable of

initiating a selected or zoned unlocking of secured portals during potential emergency incidents or situations. Coordinate the requirements of this physical interface with other disciplines affecting the Work.

- E. Ensure integration with, and control of, motorized doors, gates and turnstiles included in the project.
- F. When the access control system is used to activate or open doors equipped with motorized operators and electric locks, provide a 0.5 second delay timer to delay activation of the door operator until the electric locks are released.
- G. Multiple Contractor User privilege levels established during the installation and testing periods of this Project shall be removed from the system, unless otherwise authorized in writing by the Owner.

MATERIALS, GENERAL

- A. Power: All ACS equipment shall operate on 120-VAC. Any special power treatment required, such as filtering or spike elimination that may be required for proper operation and protection of the ACS, shall be provided with the system.
- B. Backup Power: ACS equipment shall be supplied from a UPS system, which shall be tied to emergency building power circuits. The UPS shall power the equipment including, but not limited to, access control processors, modules, electronic locks and lock power supplies for a minimum of 4 hours. Access control system PC Servers and Workstations shall be equipped with a local Uninterruptible Power Supply (UPS). The UPS shall provide a minimum of 600VA.
- C. Hardware: Provide a distributed access control system as required for a complete operating system as described herein and as shown on the Drawings.

ACCESS CONTROL SYSTEM HARDWARE / FIRMWARE

- A. All the hardware shall be provided with enclosures, which have hinged doors and latches. All the enclosures shall be equipped with tamper switches.
- B. Control Panels
 1. The control panels shall be independently programmed, intelligent devices, which shall be able to make decisions at the local level. The system shall provide reader controllers at 2, 8 and 16-reader capacity.
 2. The system shall also provide alarm control boards, which has 24 supervised contacts and 24SPDT relays. It shall be connected to reader controllers with 8 or 16-reader capacity. These boards shall be utilized for alarm control as well as elevator control.
 3. The system shall support direct and master/slave configurations. Reader Interfaces and controllers may be connected to the same board but they may not be mixed in the same channel.
 4. The system shall also support small controller boards, which is ideal for small systems. These boards shall act as master controllers, which shall be able to support a maximum of sixteen (16), control panels with 2-reader

capacity. These controllers shall support any kind of read head technologies and keypads.

5. The communication between the PC and the control panel shall be directly through a serial port or through an IP addressable modem. The system shall also support dial up connection.
6. The control panel shall also dial the PC automatically when the alarm or the transaction buffer is 75% full.
7. The communication between PC and the control panel shall be via RS232 protocol on a direct connection.
8. The communication between control panel and the reader interface shall be via RS485 protocol.
9. The control panels shall be used with any combination of read head technologies: magnetic stripe, wiegand, barium ferrite, bar code, smart card, biometric and more.
10. The panel shall provide monitoring of up to 16 supervised or unsupervised contact inputs and fourteen (14), 3-amp relay outputs, in addition to monitoring AC power and low battery. To support this functionality, an expansion board shall be required.
11. The control panels shall be filtered at the operator level. The filter shall allow operating, editing, viewing or denying access to the hardware.
12. All the commands and updates to the panels shall be verified and shall automatically retry if communication have failed.
13. Provide a system scheduler that shall automatically call remote locations to update panel information and get transactions.
14. Each panel shall be addressed within the system by a unique user defined name.
15. The control panel shall incorporate an on-board 16-channel multiplexer to support up to 16 readers. In cases where the physical environment dictates running a single pair of wire, the panel shall provide a point on the board capable of supporting up to 16 card readers in a multiplex or multi-drop configuration. Hardwire connection shall be 2-Wire RS485. Full duplex RS232, shall support only 8 card readers.
16. The controller shall incorporate integral on-board auto-answer, auto-dial modem for call back. If a network connection is present, the dial-up connection shall serve as an alarm backup in case the network is busy or fails. There shall be a provision to call alternate telephone numbers when alarms occur. For additional security, the control panel in a dial-up configuration shall dial the PC back before receiving any data. The control panel shall provide a response time from card presentation to GO/NO-GO indication, not to exceed one second, regardless of the number of card readers active in the system at any time.
17. The control panel shall provide control of up to 14 scheduled or event driven relay outputs.
18. The control panel shall have dynamically allocated RAM memory to store up to 125,000 card i.d. numbers up to six digits in length. Additional RAM modules shall be available in 3MB and 7MB, to achieve the 125,000-card memory requirement.
19. The control panel shall Store a minimum of 4,000 card access transactions when offline from the network.
20. The control panel shall incorporate built-in data backup in the form of a lithium battery or "Super cap" to last 168 hours.

21. The control panel shall have a 7-Amp hour Gel Cell battery for standby operation.
22. The control panel shall incorporate a built-in, real-time clock for providing scheduled event programming. Clock shall be initially set and subsequently updated from the PC or hand-held programmer described above.
23. The control panel shall be able to run on low voltage: 14-17VAC or 12VDC. Power consumption shall not exceed 600 mA (excluding card readers).
24. The panel shall support a palm application for control panel diagnostics. The user shall be able to use it for trouble shooting purposes.
25. Contact Point Supervision
 - a. The control panels shall support supervision of contact points to detect any tampering with the equipment, including breaks and/or shorts in the cable between the reader controller and the supervised input point.
 - b. To detect trouble in the circuit, terminating resistors shall be installed within the contact. These resistors shall allow the controller to distinguish between a contact point opening or closing from the circuit opening or shorting.
 - c. The controller shall support three methods, or types of supervision.
 - 1) Type 0: Both series and parallel resistors at the contact
 - a) Door Held Open (DHO) or Door forced Open (DFO)
 - b) Contact Secured
 - 2) Trouble Open (break in the circuit)
 - 3) Trouble Short (a short in the circuit)

C. Reader Interface

1. Each reader in the system shall have a dedicated reader interface.
2. The reader interface shall support multiple read head technologies including:
 - a. Magnetic Stripe (swipe or insertion)
 - b. Wiegand (swipe, insertion or key)
 - c. Proximity
 - d. Barium Ferrite
 - e. Keypad
 - f. Bar Code
 - g. Bio Metric
3. The reader interface shall contain and control up to two single pole/double throw 1-amp mechanically latching relays.
4. The reader interface shall provide six supervised or unsupervised contact inputs (in addition to the 16 supervised or unsupervised inputs on the controller).
5. A noise suppression kit shall be included with the reader interface.
6. The reader interface shall communicate via RS-485, two-wire cable up to 4,000 feet from the control panel to which it is connected, using 18AWG, 1 pair, stranded, shielded, twisted.
7. The reader interface shall support programmable degraded mode by allowing up to four (4) different facility codes at each controller location. Degraded mode for an individual reader shall be programmable via the PC system software e.g. door is not).
8. The reader interface shall support an audible GO signal.

9. The reader interface shall support multi-color LED for GO and NO GO indications.
- D. Optional Devices
1. The system shall provide expansion board with 12 additional relays and 8 contact inputs.
 2. The system shall provide memory expansion boards with 3-7 MB memory.
 3. The system shall provide on board modems and IP modules.
- E. Pre-wired Enclosures – The control panel shall be housed in a pre-wired metal enclosure, which shall accommodate one Reader Controller, 8 RINX Reader Interfaces, and shall include:
1. Pre-wired 16/32 VDC 100 VA power supply.
 2. Pre-wired 12/24 VDC 100 VA power supply.
 3. Pre-wired (2) 7 amp-hour batteries.
 4. Pre-wired 12VDC 4.0 amp power supply.
 5. Pre-wired Communication Housing.
 6. Individual 1 amp fusing for reader, egress device, electric door lock.
 7. Pre-printed and color coded wiring termination labels.
 8. Optionally, there shall be a 6 amp 24 VDC lock power supply/charger with Emergency Relay and (2) 7 amp-hour batteries.
 9. Dimensions shall be 30" H x 30" W x 8" D, with two-inch EMT knockouts and locking double door.
 10. When more than 8 readers are connected to one RCNX Reader Interfaces 9-16 shall be housed in a GENC-RINX enclosure with specifications identical to those listed above.

ACCESSORIES

- A. Request-to-Exit Motion Detectors:
1. Motion detectors shall be used to shunt alarm signals when exiting. Detectors shall not be used to unlock the access door.
 2. 12VDC Request-to-Exit (REX) sensors:
 - a. Field adjustable for coverage.
 - b. Form C relay output for signaling to Controller.
 3. Door Position Switches/Contacts:
 - a. Hermetically sealed magnetic reed switch.
 - b. Contact & magnet housing shall snap-lock into a $\frac{3}{4}$ " hole.
 - c. Provide 45-degree condolettes to enclose and protect cabling from door contacts/switches. Condolettes shall be placed as close to the contact/switch as possible.
- B. Hardware Specifications
1. Control Panels
 - a. Power – 12-24 VDC, 12 Amps
 - b. Power consumption – 600 mA
 - c. Ambient temperature – 0° to 49° C or 32° to 120° F
 - d. Humidity – 10% to 85%
 - e. Maximum distance to PC – 50 feet RS232 communication
 - f. Recommended cable – 22 AWG/3 conductor stranded, shielded

2. Reader Interfaces
 - a. Power – 12-24 VDC, 12 Amps
 - b. Power consumption – 600 mA
 - c. Ambient temperature – 0° to 49° C or 32° to 120° F
 - d. Humidity – 10% to 85%
 - e. Recommended cable (connecting to control panels)– 18 AWG/3 conductor stranded, shielded
 - f. Recommended cable (connecting to read heads)– 22 AWG/3 conductor stranded, shielded
 - g. Maximum distance (both to controller board and read head) – 500 feet
3. Accessories
 - a. Door Contacts
 - 1) Voltage: 100 V AC/DC max.
 - 2) Current: 0.5 A max.
 - 3) Power: 7.5 W max.
 - 4) Loop type: Closed – N/O.
 - 5) Mounting: Recess mounted.

ACCESS CONTROL SYSTEM SOFTWARE

- A. System Communication: System shall provide an interface (Communication Interface Module or CIM) to issue all database changes to the Reader Controllers. This software module also shall have the ability to gather all the information (transactions) from the Reader Controller and store it in proper history files.
 1. The CIM shall reside on any workstation or server. On a single user system, the CIM shall reside on a workstation, but on a multi user system that uses multiple CIMs, it shall reside on any workstation or server.
 2. The communication between the CIM and the controllers shall be through direct cabling, phone lines or TCP/IP communication protocol.
 3. All serial ports to which the controllers are connected shall be configured using an easy to follow menu. All the COM PORT status messages shall be color-coded.
 4. An operational tab shall be provided to tell the CIM to check for the changes that are made in the database.
 5. The CIM shall have a specific window, which shall display all the Controllers connected to a COM Port. The user shall be able to select one particular Controller and get all the information pertaining to that device. (e.g. Device number, channel, address, phone number, connection status etc).
 6. The user shall be able to schedule automatic updates of controller panels. The CIM shall be able to communicate with the control panels located at remote locations via a dial up modem, at scheduled intervals and update the data in the controller memory.
- B. Communication Management: System shall facilitate a program that controls the communication between the CIM and the workstations.
 1. Application shall be in charge of directing transactions and alarms to proper workstations.

2. Program shall be capable of sending alarms of e-mail messages to legitimate e-mail accounts.
- C. Access Rights: Software shall allow for assignment of the access rights to badge holders. The access right is the combination of what “Areas” the badge holder can go (badge and elevator readers) and when the badge holder can go there (time zones). Each badge holder shall be allowed multiple “Area” access rights. Each access right shall be allowed to have a different time schedule.
1. Software shall automatically load the proper access rights into each field panel without any operator intervention. There shall be no limits on the number of access rights (who goes where and when) by the system design.
 2. Access Privilege Expiration: Include the ability to force an expiration of access privileges in any or all areas with a simple mouse clicking procedure.
 3. Extended Access Privilege: Include the ability extend the access privileges in any or all areas with a simple mouse clicking procedure.
- D. Event Triggers: System shall provide flexibility when associating action items with time zone programmed events, i.e. card transactions with contact reporting and relay activation.
- E. System Management: System shall provide a tool that will integrate and categorize the Owner’s data and at the same time the user shall be able to simultaneously monitor and maintain a secure working environment.
1. The system shall contain the definition of all intelligent field control panels (i.e. Reader controllers (RCs), card readers, contact inputs etc). There must be a provision to label each device with at least a 20 character alphanumeric description to easily identify each component.
 2. System software shall be designed to allow operational management and control at many “tiered levels” with the apex of control being in the hands of a “Global Manager”. The “Global Manager” shall have administrative authority for the entire system and delegate administrative responsibility as follows:
 - a. Area Management and Area Sets: Provide a functionality to divide the protected facility into logical areas, which can be either one physical location (e.g. main lobby) or many logically related physical locations (e.g. All the computer rooms in 12 different cities). System administrators shall be assigned jurisdiction in one or more areas through assigning proper security privileges to the areas. The system shall provide a functionality to organize areas to area sets to provide segmented security.
 3. Categories: Within one area or many areas, administrators may only have jurisdiction over certain categories of cardholders or devices:
 - a. Cardholder Categories: The system shall permit the administrator or authorized operator to create cardholder categories. The categories shall be used to define access rights for certain types of employees, such as “Temporary workers” or “IT employees”. All the categories defined by the user should be available in the form of a drop-down menu for the ease of modification.

- b. Devices: The system shall allow assignment of operator privileges to be restricted to programming only devices in certain “areas” such as “turnstiles”, “handicapped access points”, “motion detectors” or “building management” related devices.
4. Door Types: The system shall support a minimum of eight user-definable door types within an area. For example, in a lobby area, it shall be possible to restrict most employees to “turnstiles”, and only physically challenged employees would be permitted to access “handicap gates”.
5. System State: The system shall have the ability to place an area in various user-defined states such as normal access, fire emergency, strike lockout, etc, thereby changing the access rights to the respective areas without having to change individual cardholder access privileges.
6. Holidays and Holiday Sets: The system shall allow the user to define the holidays according to the specific needs. There shall also be the facility to group holiday dates into specific grouping so that, time zone assignments can include all the individual holidays in that. Holidays shall be organized into holiday sets for easy management.
7. Time Zones: Time zone definitions shall include starting time, ending time, days of week and holidays. Time shall be definable in either AM/PM or 24-hour (military) time. Maximum time zones that can be defined in a system shall be unlimited.
8. Site Codes and Site Code Sets: The system shall allow to program readers in degraded mode. In degraded mode the system should allow access to cardholders when the controller board has lost data communication with the Reader Interface.
 - a. The system shall provide a functionality to assign a number ranging from 1 to 1,000,000 to each site.
 - b. Cardholders shall be assigned one of these numbers for a specific site while the same number should not allow access to another site.
 - c. Any lost communication shall not interfere with access being granted as site codes are downloaded and retained in the reader memory.
 - d. When site codes are programmed and downloaded to the controller, the board should check for validity of that site code against the card that has been read. If the site code does not match what is stored on the board then access should be denied.
 - e. Cards that are purchased from Schlage Security Management System shall have the site codes encoded on the card. The site codes shall be able to organize into site code sets.
9. Call Back Numbers and Call Back Sets: The system shall provide a facility to define call back numbers for modem communication between reader controllers and the CIM. The user shall be able to put the Call Back numbers into Call Back Sets.
10. Hardware Definitions: The system shall allow the configuration and programming of the system hardware by easy programming. The user shall be able to define workstations, CIM, CIM Ports controllers, readers, relays and contact points. All the information entered shall be editable using an easy to use interface.
11. Device Status: The operator shall have the option to view a single device’s state at any point off time. The user shall be able to request and receive the status from any reader, relay or contact. The status is displayed in a dialog box when it is received.

- F. System Security: The system shall be secure both in its operation and administration. The system shall offer ample flexibility for the administrator to establish and customize any level of security by assigning security permissions to group of operators. The individual operator shall be able to log into the system using a unique operator i.d. and a password associated with that operator ID. The “Administrator” of the system may set the following rules and standards:
1. Login Requirements
 2. Logging into the system shall be restricted using User i.d. and password. The user i.d. shall be of alphanumeric characters. It shall be a unique i.d. and cannot be duplicated. Password also shall be of alphanumeric characters but shall be case sensitive.
 3. The administrator shall be able to define the expiration date of the password. The administrator shall have the ability to set a pre-determined period of days in advance to warn the operators upon login, as to how many days remain before their passwords expire. The administrator shall also have the ability to set the password valid for an indefinite amount of time.
 4. The administrator may disable an operator’s password at any time by merely checking a box for that function. The administrator may also set the following conditions for disabling operator passwords automatically:
 - a. After a programmable number (1-999) of consecutive illegal login attempts, e.g. wrong operator i.d. or wrong password for that operator ID.
 - b. After a specified number (1-999) of days of non-usage of the system by the individual operator.
 5. The administrator shall also be able to pre-set the system to automatically lock out the operator workstation currently in use by the offending operator for a specified or indefinite period of time, until the administrator resets the password.
 6. Operator Security Groups: The system shall provide a functionality to define security groups, assign privileges and place individual operators into these groups. Though one operator shall be placed into only one security group, he/she shall be switched to a different security groups with one mouse click. These security groups shall in turn determine the security privileges of the operator. A security group shall have at least the following permissions:
 - a. Whether multiple logins are allowed as opposed to only being allowed to login to the system a single time.
 - b. Whether the operator has to exit the security system in order to return to the Windows operating system.
 - c. What system software programs are available to the operator in this specific security group.
 - d. What privileges are extended to the operators in a specific security group as it pertains to accessing various elements of the System Data Base and in performing assigned functions.
 7. Operator Privileges – The administrator shall have the ability to assign permissions to operators as far as gaining access to and exercising database functions. Once an operator has logged into a given workstation, the system shall display only those programs to which the operator has at least Read Only permission. The system shall offer tighter security by providing the functionality to assign privileges not only to programs and

reports but also to fields like areas, area sets, cardholders, cardholder categories and all user defined fields.

8. Default Security Privileges – The System Security module shall allow predefining the default permissions settings. These settings shall only affect privileges for new security groups that are added. It shall not cause any changes to permissions assigned to existing groups. To access these settings, the operator must have Administrative privileges. Permissions for new groups shall default to these settings (set to None), however these settings shall not be assigned to the System Administrator group or members of the security group that added the field. The permissions can be defined on a need to know basis. Privileges are defined as follows:
 - a. None – No ability to view or edit a particular field in the database (e.g. Encoded number in the cardholder file)
 - b. Read Only – Only the ability to view the contents of a particular field in the database. The Edit option for the related programs or fields shall be disabled.
 - c. Read/Write – The ability to both view and edit a particular field in the database, except those fields reserved for operators with “Administrative” status.
 - d. Administrative – The ability to perform all system-wide functions (functionally same as Read/Write permissions).
 - e. The above privileges shall be applied as follows:
 - 1) Area Sets – The Administrator shall have the ability to prevent a group of operator from viewing, modifying or deleting (specific) Area Sets while allowing them to insert new Area Sets to the database.
 - 2) Categories – The administrator shall have the ability to restrict the operator from viewing, editing or deleting cardholder categories. e.g. Training department, Technical support department.
 - 3) Cardholder Fields – The operator privileges shall be extended only to individual user-defined fields in the cardholder database, e.g. “Keypad ID”, “Stamped ID”.
 - 4) Override Sets – Within the assigned area and categories the operator shall be given permissions to override standard system settings to perform such functions as unlock doors, shunt alarm points, turn on or off control points normally operating on a schedule.
 - 5) Device Types – Within a defined “Area”, the operator privileges shall be extended only to specific user-defined categories of devices, e.g. “Handicapped card readers”, “Turnstile card readers”, “Life Safety sensors”, “Environmental controls”, “Vehicular gates”, etc.
 - 6) Filters – The Administrator shall create filters for transactions and operator privileges shall be extended to the ability to delete or view selected transactions as they occur in real-time mode.
 - 7) Applications Launcher – The operator privileges shall be extended only to selected application programs such as “Alarm Monitor”, “Alarm Graphics”, “Transaction Monitor”, “CCTV Camera Control”, “Cardholder Definitions” etc. Setting

permissions to None for any item shall remove it from the System Launcher screen.

- G. Reports: Assigning appropriate privileges to operators shall restrict generating or running reports.
- H. Badge Layouts: Badge layouts shall be protected by assigning appropriate privileges.
 - 1. New records (new module, report, user defined cardholder field) that are added to the database shall have None permissions until the Administrator modifies the permissions.
 - 2. The operator shall be able to make the selections by placing checkmarks in the boxes as opposed to highlighting the text in order to prevent erroneous assignments, as well as for the ability to make multiple selections.
 - 3. The assigned fields shall display in the permission's color (None, Read Only, Read/Write and Administrative).
- I. Start-up Programs:
 - 1. The programs such as CIM, SP, CCTV, History Archive, Universal Triggers, Alarm Monitor and Alarm Graphics etc (both Alarm Monitor and Alarm Graphics shall not be added as the start up programs at the same time) shall be set to launch before the operator is logged in to the system.
 - 2. The administrator shall be able to select any programs from the above list and set to launch before the operator log in.
- J. Cardholder Creation and Management: The system shall provide an easy to use interface to add, delete or modify cardholder information effortlessly. With the use of wizards the user shall be able to input and retrieve data regarding area access, active, retired badges and cardholder categories etc.
 - 1. The cardholder information shall include the following fields for each badge being issued.
 - a. Cardholder's first name and last name.
 - b. Activation and expiration dates (spanning years).
 - 2. A unique encoded number – The number that is encoded within the card and used as a means of identification. The number of digits encoded shall be capable of containing the equivalent of a social security number (e.g. 123-45-6789 = 123456789) plus a 2-digit issuance code (See Badge Issuance Number below)
 - 3. A variable keypad number that the user can select from 1 - 9999.
 - 4. Badge Technology – The technology in use for this particular badge, to be selected from a “drop down” list as follows:
 - a. Bar code
 - b. Barium ferrite
 - c. Magnetic stripe
 - d. Proximity
 - e. Wiegand
 - f. Biometric
 - g. [User-Defined]
- K. Badge Layout: The visual representation of the badge, as it shall be printed.
 - 1. Areas and area sets the cardholder has access to.

2. The following fields shall be available for the use at the administrator's discretion:
 - a. Stamped i.d. – The number that is “heat stamped” on the card (not the encoded number)
 - b. Badge issuance number – Upon entering, the default for this field shall be set at “0”. This number can be incremented by the operator if the badge is reissued because it is either damaged or lost.
 - c. Badge Status – The current status of the most recently issued badge. This shall be selected from a “drop down list” as follows:
 - d. Active – Badge is currently active
 - e. Lost – Badge has been reported missing
 - f. Stolen – Badge has been reported stolen
 - g. Destroyed – Badge has been rendered unusable
 - h. Suspended – Badge has been temporarily suspended
 3. The system shall also provide optional user definable badge states.
 - a. Door States – The types of doors that the Cardholder has access to (e.g. Normal, handicapped).
 4. The system shall provide optional user definable fields
 - a. Badge Created: Shall be automatically generated by the system during badge printing.
 - b. Date Badge Printed: Shall be automatically generated by the system during badge entry.
 - c. Date Badge Modified: Shall be automatically generated by the system during subsequent badge modifications for access or categories for that cardholder.
 5. The system shall allow the user to duplicate specific user definable information like area access, categories, badge layout, technology etc whereas, fields like encoded id, stamped id, portrait, signature etc will be unique to each cardholder. This feature shall be available with in a single mouse click.
 6. The system shall also allow the creation of templates that contains general cardholder information like area access and categories. Encoded id, stamped i.d. etc shall be unique for each cardholder.
 - a. For example, the system shall allow the creation of a template for all the members of the engineering department or sales department of a company and save it in the database. When the user creates a cardholder and assigns badge, the user shall be able to use the corresponding template.
- L. Allow multiple credentials per cardholder. Cardholder data shall be modified and deleted directly from the main screen or by using menu, hot keys or tool bars. Include the following attributes:
1. The option to retire active credentials whenever a new badge is initiated.
 2. Functionality to automatically choose a badge technology and badge layout whenever a new badge is added.
 3. While deleting multiple cardholders at the same time, any attempt that fails shall be added to a list and presented to the operator with the cause of error.
 4. Functionality to mass change access control fields for activation/expiration dates, access block and antipass back.
 5. Cardholder search wizard to make finding cardholders a simple process.

6. Functionality to make multiple selections in the cardholder search window by holding down the Ctrl key.
 7. Provide options to include time zone reference.
 8. Upon editing card information, the updated information shall be sent automatically to the appropriate access control panel, when hardwired, with no other user intervention. If the scheduler is used, then the card updates shall be sent based on scheduling.
 9. The system shall allow the user to add e-mail addresses of the cardholders into the database.
- M. Person with Disability: The system shall allow additional access to doors for physically challenged cardholders.
1. When a new cardholder is added to the system, the operator shall have an option to select a specific field with Person with Disability option. The event triggers for LED Green transaction shall be programmed in the System Manager. The Duration field shall allow for a longer transaction (e.g. 30 second versus the standard 5 seconds). The field, Person with Disability, shall also be added to the All Cardholders and Cardholder by Category grids of System Manager. The value shall default to false. The CIM shall be modified to update panels with the Person with Disability feature when a cardholder record is downloaded. Privileges to this field shall be assigned in the System Security module under cardholder field permissions.
 2. Online Credentials: The system shall provide the ability to assign online credentials to cardholders that communicate directly with the controllers.
 3. Offline Credentials: The Schlage Security Management System shall support offline readers which do not communicate with the host controller directly. The user shall be able to create necessary downloadable files and upload to a pocket PC. The data shall be transferred to a PDA by connecting to the serial communication port of the PC. The programming of doors shall be accomplished by connecting a CIP (Computer Interface PAK cable) from the laptop/palmtop to the iButton ports of the lock.
- N. Assigning Area Access: Provide functionality to define cardholder's access to selected Areas and Area Sets.
1. Provide the ability to define specific time of access.
 2. Access Control function shall include validation based on time of day, day of week, holiday scheduling and positive verification of site code, card number or PIN number verification.
 3. Provide a template of defined access level detail, where changes can be made to the template and saved as a new access level.
 4. Provide an option to create user definable area states and door types and there by giving the cardholder access at special circumstances.
 5. The system shall also provide the user to define access control templates while defining area sets. When a new area is added to the area set, templates of access level detail, where changes can be made to the template and saved as a new access level template.

- O. Portrait Capture: Provide ability to store digital images of the cardholder. One cardholder shall have only one image attached to one record.
 - 1. The images shall be taken using a digital camera or a TWAIN device. The system shall also provide the functionality to save the images in the hard drive. The operator shall be able to retrieve the files for future use.
 - 2. The system shall provide necessary tools for image editing like cropping, resizing centering the image etc.

- P. Portrait Enhancement: The system shall provide a functionality to enhance the cardholder portrait. There shall be a utility, which enables the operator to improve the quality of the picture by adjusting the brightness.
 - 1. The operator shall be presented with 15 different views of the cardholder portrait. The "Increase" and "Decrease" buttons shall help the operator to make the picture lighter or darker.
 - 2. The operator shall be able to access this utility from the program where he/she defines the cardholders and captures their portrait.
 - 3. The system shall also provide a transparency preview of the image.
 - 4. The system shall also allow the user to edit the image through a third party application. Editing an image shall be limited to changing background color, resizing the image, cropping etc.

- Q. Portrait Exporting: Provide a functionality to export cardholder portraits in JPG format.
 - 1. The operator shall be able to copy the files to a folder that exists outside the system software. The operator shall be able to select the directory to which the portraits are being exported.
 - 2. When exporting files the user shall be provided with an option to decide the file naming convention.

- R. Signature Capture: Provide ability to store a digital signature of the cardholder. Each cardholder shall have only one signature attached to his/her record.
 - 1. The operator shall be able to use an already saved signature or the system shall provide the option to capture a fresh one using any TWAIN device.
 - 2. The system shall provide necessary tools to edit the signatures like cropping, centering etc.

- S. User Definable Fields: The system shall provide a functionality to create additional User Definable Fields that shall be applicable in certain programs. A few examples will be Nickname, Social Security Number etc.
 - 1. The user shall be given an option to select the type of fields from a variety of choices like:
 - a. Look up list
 - b. Boolean
 - c. String
 - d. Integer
 - e. Date
 - f. Time
 - g. Date & Time
 - h. Notes

2. When defining a user definable field, the system shall give the user the flexibility of deciding whether the field is pertinent only to cardholder database or guest pass database or both.
 3. The user shall be given an option to make the new fields "Required".
 4. The user shall easily modify the user definable fields. The user shall be able to resize, align and position the fields either by dragging the edges of the fields or by entering specific values of dimension.
 5. The system shall provide a way to organize the newly created fields along with the predefined fields that already exist in the program.
 6. The system shall display the predefined fields in a programmable font color.
- T. Designing Badge Layouts: The system shall provide functionality to design and print badge layouts.
1. The features of the badge-designing program shall include the ability to use background color, background image, inserting pictures, logos, signatures and a variety of fields that the operator uses while defining a cardholder.
 2. The user shall be able to use professional layouts.
 3. Images of different formats (JPG, GIF, BMP) shall be inserted into the badges.
 4. The user shall have the option to make the background of the image transparent.
 5. The user should be able to customize the badge by making the following selections:
 - a. Adding any cardholder fields.
 - b. Text style.
 - c. Font style.
 - d. Font color.
 - e. All upper caps.
 - f. Horizontal alignment.
 - g. Vertical alignment.
 - h. Text background color.
 - i. Border setting.
 6. The program shall provide a functionality that allows the user to test the portrait or signature's transparency effect by changing the background color.
 7. The program shall provide an easy way to edit all the information entered into the badge.
 8. The user shall be able to view both sides of a badge.
 9. The program shall save the changes automatically while changing the sides or moving to another layout.
 10. The program shall also support magnetic stripe encoding. The program shall provide three tracks for the magnetic stripe cards. The user shall be able to insert the cardholder information like PIN or Encoded i.d. or hard coded text (the user shall be able to type in the text) into these fields. Each field added shall be separated with a separator symbol.
 11. The program shall provide a wizard that helps the user to select the fields he/she wants to insert into the magnetic stripe fields.
 12. The user shall have the option to duplicate the badge layouts with a single mouse click.

13. The badge layouts shall be secured using the system security. Only operators with Read/Write permissions shall be able to modify or create badge layouts. The permissions set to a badge layout shall affect an operator using the badge layout in the Cardholder Definition, Badge Queue and Guest Pass System.
- U. Printing Badges: Once the badge is created the user shall be able to print it from the badge creation program.
1. The badge creation software shall be able to override the default printer settings and use the dimensions of the badge, which in turn will decide which layout to use while printing.
 2. The program also shall provide an option to print dossier reports.
 3. Badge Automation
 4. The system shall provide a functionality that enables the operator to automatically choose a badge layout and a badge technology whenever the user wants to add a badge to a cardholder record.
- V. Export and Import Badge Layouts: The system shall have the ability to export and import badge layouts.
1. The system shall have the functionality to save the badge layouts as binary files in a specified folder whenever they are exported or imported.

TRANSACTION AND ALARM MONITORING

- A. Transaction Monitoring: The software shall include a real time display of all or selected transactions in the system as they occur.
1. The screen shall display substantial information about each transaction (e.g. cardholder, card number, access granted or denied, location, etc.). The operator shall be able to see only those user definable fields, which he has been given permission to view.
 2. The Transaction Monitor shall be split into two sections: (1) All cardholder transactions, (2) All device and operator transactions.
 3. The system shall provide a feature that enables the CUSTOMER to set filters for unwanted transactions. The software shall allow the CUSTOMER to select specific cardholders or devices that generate the transactions.
 4. The software shall provide functionality to save the transaction monitoring screens and auto load them whenever a transactions occurs.
 5. The software shall have the capability to dial-up the controllers located at remote locations via a modem and receive transactions.
 6. There shall have a facility to view a recommended minimum of five (5) on-line transaction-monitoring screens at one time, at a single terminal.
 7. The user shall have the ability to customize the online monitoring screen into two individual partitions. One displaying cardholder transactions and the other one displaying device and operator transactions. The operator shall also have the flexibility of turning off any of these transactions and view only one type of transactions.
 8. A pause button shall be provided which shall enable the operator to stop the display of selected transactions.
 9. Transactions may be color-coded according to the dictates of the administrator. Color-coding shall extend to both the background color as well as text (foreground) color.

- B. Viewing Previous Transactions: Include ability to view previous (past) transactions from the transaction monitor screen. The user shall have the ability to set a "filter" that shall select what type of event(s), what cardholder(s) and what device(s) shall appear while viewing past transactions. When the scrolling process is complete, the operator shall be able to invoke a single keystroke or mouse click to return to the current transaction screen.
1. Link to Cardholder Database – System should allow the operator to right click on any access transaction and bring up the database profile of the cardholder in question, including a thumbnail of the cardholder's portrait.
 2. Link to Recorded Video – The operator shall be able to right click on any transaction, if there is a camera associated with the access control or contact activation location, the operator will be presented with a "Play Video" button. The operator shall then be able to link with the digital video recorder and play back recorded events from that location. This should be accomplished through a single mouse click. A digital video recording system also shall be available with the access control system to support this feature.
- C. Alarm Processing and Monitoring: The system shall permit the programming of alarms (contact inputs) with a priority level and instructions, if any, to be followed when the alarm occurs. The system shall offer up to 126 levels of priority, with 1 being the highest and 126 the lowest. Each alarm point shall be addressed within the system by a unique user defined name.
1. All system transactions shall be defined as alarms.
 2. The operator shall be able to view, acknowledge and secure alarms. The system shall alert the user immediately upon receipt of an alarm by popping up an alarm window on-screen. The alarm window shall contain the following information: cardholder information, date, time, transaction description, priority level, device number, and reader controller number, and how many unacknowledged alarms are in memory.
 3. In a multi-user environment, the user shall have the option of directing incoming alarm signals to an alarm display terminal and/or to a specific individual (identifiable via log-on ID) for the purposes of reviewing and initiating the alarm dispatch function. Alarms emanating from a field panel located in a remote facility shall be transmitted immediately through the remote controller's IP addressable device or a dial-up modem.
 4. The system shall also have an audio alert (e.g. beep) that an alarm has been received. The administrator shall be able to customize the audio files according to the type of alarm. If more than one alarm is received at one time, the system shall put the higher priority alarm on-screen. The operator shall be able to silence the alarm by pressing any key. The next alarm shall appear immediately.
 5. The operator shall be able to right click on any alarm and view the portrait of the cardholder in question. The operator shall also be able to link to the cardholder database and get the information regarding the cardholder that enable him/her to take appropriate access control decisions.
 6. If there is a camera associated with the alarm/contact point in question, the operator must be able to receive "live video" from the scene with a single mouse click.
 7. The operator, in addition to receiving live video from the scene, shall also have the ability, via a single mouse click, to retrieve recorded video of the

scene. The recorded video shall contain a user-defined amount of video frames before the event and subsequent to the event. It is essential that the system shall allow both the live video and the recorded digital video being displayed "side-by-side" on the same computer workstation.

8. Provide ability to acknowledge any alarm or reader activity based on priority.
9. Provide the display of system activity with higher priorities displayed at the top of the list.
10. Alarm Monitor shall continue displaying an alarm, until it is acknowledged and secured. For example, certain alarm transaction types shall relate to normal physical state of a device. When the normal state changes, an alarm may be triggered. e.g. A contact alarm for a door being forced open. This alarm shall remain in the monitor until the contact device has been secured.
11. The user shall also be able to view instructions, if any, for responding to a particular alarm. This shall be achieved by a single mouse click. The instructions given to the operator shall be presented on a single screen in Windows graphical interface format. There shall be a functionality to dispatch instructions via sound files (.wav).
12. The operator shall be able to view the alarms that occurred in the past without exiting the online monitor.
13. Varying alarms shall be color coded according to the dictates of the administrator. Color-coding shall extend to both the background color as well as the text (foreground) color.
14. The system shall allow the configuration of different door alarms based on the activity at that door. The alarms shall be caused by any of the following activities.
 - a. Door Forced Open
 - b. Door Held Open
 - c. Access Under Duress
 - d. Access Denied
 - e. Alarm Acknowledgment
15. The operator shall be able to direct individual alarms to specific groups of PC/workstations on the network. The user shall have the ability to define 32 different groups of PC/workstations, with up to 15 PC/workstations in a group. Each PC/workstation shall be identified through the workstation name. Each alarm point may be assigned to a specific group of PC/workstations.
16. If the first assigned group does not acknowledge an alarm in a period of time defined by the user, the alarm shall be rerouted to another group of PC/Workstations on the LAN, if available.
17. As part of establishing standards for alarm acknowledgment, the user may set parameters that force the operators to enter comments either free-form, or by prompting the operator by issuing "labels" to which the operator shall enter a response. The operator shall either select from a menu of "predefined" responses or respond free form. There shall also be the facility to store these responses in the historical logs and add to them at a subsequent time if the situation warrants follow up.
18. The administrator shall also force the operator to login before acknowledging the alarm. Only after these criteria are fulfilled can the

alarm be considered acknowledged and the operator shall be allowed to return to other system functions.

19. The operators shall be able to perform override tasks that are attached to the alarm display when an alarm is defined. These tasks include locking/unlocking doors, changing system state to "Lockdown".
- D. Alarm Graphics: A graphical depiction of the alarm shall be presented to the operator in the form of a blueprint and/or illustrative photo of the scene of the alarm. Icons may be imposed on the graphics whereby the operator can right click on the point of alarm and have immediate access to all of the following:
1. Audio Playback - An audio playback of dispatch instructions via a "Windows Wave File" (.wav).
 2. Text Interface – A text interface whereby the operator can enter comments regarding actions taken. The operator shall either select from a menu of "predefined" responses or respond free form.
 3. Live Video – If there is a camera associated with the alarm/contact point in question, the operator must be able to receive "live video" from the scene with a single mouse click.
 4. Digital Video Playback – The operator, in addition to receiving "live video" from the scene, shall also have the ability, via a single mouse click, to retrieve recorded video of the scene. The recorded video shall contain a user-defined amount of video frames before the event and subsequent to the event.
 5. Manual Overrides – The operator shall be able to execute the defined manual override commands with one mouse click whenever he/she is alerted with an alarm.
 6. Monitor Device Status – The operator shall be able to monitor the status of devices when transactions or alarms occur by double clicking on the icon.
 7. The system shall support user programmable high-resolution color graphic map displays that are capable of showing the floor plan, location of the alarm device and alarm instructions. The maps can be created in BMP format and shall be capable of being imported from other systems. The system shall provide the ability to drop dynamic object icons to drawings. These icons shall allow the system operator to perform task command related to the object. All the defined alarm graphic maps shall be displayed on the operator's monitor.
 8. There shall be a facility to define different icons for 4 (four) different alarm states:
 - a. Default
 - b. Unacknowledged and Unsecured
 - c. Acknowledged but unsecured
 - d. Unacknowledged but secured
 9. Include functionality to create custom animated graphics (icons) for different alarm states. The user also shall be able to edit or modify the animated graphics.
 10. When an alarm is activated the operator shall be interrupted with the change of an icon state (using animated graphic) and/or with an attached sound file (.wav). The operator shall be able to scroll down to the icon's location in the map

11. Alarm Graphics workstations shall be able to communicate with one another and communicate to any number of clients that are connected to the graphics system.
- E. Manual and Automatic Overrides: The system shall allow manual and automatic control of selected output points. Manual panel control shall include energize/de-energize options for output points as well as the option to override any schedule changes in the output state.
1. Manual Overrides: The system shall provide a facility to manually change a device's normal function, possibly to allow temporary access to an area, exit in an emergency situation or as an added security to an access or exit point.
 - a. The administrator shall be able to define the override tasks in such a way that the commands may be sent to several devices simultaneously (e.g. unlocking all the doors in an emergency).
 - b. The operator shall execute these tasks manually via executing a series of keyboard commands by opening the Manual Overrides pull down menu and clicking on the appropriate override tasks.
 - c. There shall be the functionality to establish a conditional, "if A occurs then B shall occur", relationship between an event and an activation of some output (e.g. access denied> relay activation). For example, an access denied into an area can trigger the lights to go on).
 - d. Manual Override Command To Stop An Activated Schedule – The system shall allow the user to issue a manual override command to stop a currently activated schedule (e.g. door unlock).
 2. Automatic Overrides: The system shall provide a way to override certain tasks automatically at a regular basis (e.g. unlocking the main lobby door during normal business hours).
 - a. The user shall be able to define the time zones according to the CUSTOMER'S needs.
 - b. In the event of computer or network failure, Automatic Device Override programming shall continue to function as programmed in the off-line mode. The off-line programming shall be universal and intelligent. Groups of up to 16 intelligent field panels shall be connected to a single Master intelligent field panel. The Master intelligent field panel shall then control off line Automatic Override so that an event at any given field panel can trigger an output at any other given field panel.
 - c. Activate An Automatic Override Schedule By A Valid Access – The system shall provide a secure way to unlock an automatic scheduled door. A valid credential access shall be required to trigger the readers/offline locks scheduled to unlock during a scheduled period.
 3. Integrated Guest Pass: The Access Control System shall also provide an integrated, personal computer based system, offering the function to pre-schedule expected visitors and grant temporary access by issuing Access Control Badges and Name Tag Labels.
 - a. System shall be capable of registering an expected guest to the system and the guest information shall be stored in the Guest Pass Database until the user deletes the record completely. The guest information shall be retained in the Guest Pass Database for the ease of pre-scheduling returning guest and report generation.

- b. System shall allow the administrator to set the requirements (what information is required for giving access rights to the visitors) according to the customer's needs. The system shall provide a step-by-step wizard, which helps the user to select the required fields.
- c. The system shall also provide an easy to use interface to add a guest into the system. The steps that the user sees while adding a guest shall be depending on the requirements set by the administrator. The guests added to the system shall be displayed in the main window of the system once the window is refreshed dynamically.
- d. The applications capabilities shall include, adding a guest, signing in a guest, signing out a guest, editing guest information, capturing and viewing images and signatures and badge and label printing.
- e. The system shall force authorization of the guests added to the system before giving access control permissions. All unauthorized guests shall be added to a pending list.
- f. The system shall be capable of generating the following reports:
 - 1) Expected guests and arrival dates, host, area to be visited, expected arrival time.
 - 2) Expected guests today, host, area to be visited, expected arrival time.
 - 3) Access control badge usage by Guests.
 - 4) Guests present in facility.
 - 5) Signed out guests
- g. The system shall allow User Defined Fields to be implemented as required.
- h. The system shall provide for the optional recording of an electronic signature and digital photograph of the guest.
- i. The system shall provide a way to notify the host regarding the arrival of the guest via e-mail.
- j. The system shall use visitor badges with unique encoded id. The user shall be able to type in the text manually or generate automatically.
- k. The user shall be able to set maximum and minimum values for the automatic generation of encoded id. When the user creates a badge, the system shall choose an unused and unique i.d. between the values set in the encoded i.d. settings. As the user creates more badges and once the encoded i.d. reaches the maximum value set, the system shall use the starting value set in the encoded i.d. settings. If that value conflicts any existing badge's encoded id, the system shall use a new value, which shall be unique and unused. At the same time the system shall also provide a way that allows the user to set the starting and ending encoded i.d. values manually.
- l. The operator shall be able to set different locations and add pending guests (the guests who don't have access control permissions) to any location. The system shall allow the user to sign in (give access control rights) the guest only to the location where the Guest Pass System is located.
- m. When there are multiple locations set in the system, the system shall allow the operator to specify one location as the global location. The guest information in the global location can be viewed from any location set in the system.

- n. While creating badges, the user shall be able to use default badge layout, technology and printers. The system shall also allow the use of default label layout and printer.
 - o. The operator shall be able to view signed in guest, pending guest, signed out guest and location of the guest in the main window of the system. The system shall also display all the user-defined fields in the main window.
 - p. The system shall use different color schemes for valid guest, about to expire guest and expired guest.
 - q. Denial of access after x number of visits When a guest has reached the maximum visit count specified in the Guest Pass Settings he/she shall be denied access and cannot be signed in. To allow the guest to override the maximum visit count, an administrator must use the Guest Pass Settings program or their visit count must be reset to 0.
- F. Guest Pass Locations: In the Guest Pass System location shall refer to the site where the computer with the Guest Pass System is installed and used. The system shall provide an option for the administrators to add, delete, modify or select a location.
1. Each Guest Pass Locations shall be linked to Guest Pass Setting and each workstation is linked with a Location. The Guest Pass System shall be installed and operated at any location where Schlage Security Management System is running.
 2. Default Location – The system shall provide a factory set location and it cannot be edited or deleted. Default location shall be used if you want to view the guest's information at every location. The default shall be a global location.
 3. To define additional locations, the system shall require hardware dongle (software license key). The dongle shall be used only on the PC where database server resides. No dongles shall be required at any workstations.
 4. The Guest Pass System shall only allow the operator to select from Guest Locations that the dongle (license key) allows them to see. If the dongle has a guest location count of 5, only 5 guest locations will display; no matter how many are actually defined. The count does not include the default location.
- G. Pending Guest Records: The system shall provide a way to create pending guest record. The guests who are not signed into the system (the guests who don't have access control permissions) shall be added to this list. The guest who is signed out from the system, but expected to come back at a later time also shall also be added to this list.
1. Guest Sign-In – The system shall create a list of authorized and expected guests for each day. The information in this list shall indicate:
 2. The identity of the guest.
 3. The identity of the person who requested the visit (the host).
 4. The responsible person authorizing the visit (an employee with authorizing permissions).
 5. Authorized time limits of the visit.
 6. Initial information (filled in by the requestor) about the Guest including name, affiliation, purpose of visit, escort/unescorted, access control badge

or no access control badge. This information shall be easily transferred or stored in further definition of the Guest record by the operator.

7. Visit Extension – The system shall provide the ability to extend a specific Guest's timeframe. If the person making the request is authorized or is the original authorizer, the operator shall click the guest's record and execute the function to extend the record. The choice will be by days or hours. The system shall automatically record the date and time of the extension. The access records of the guest shall be automatically extended by the specified amount of time.
 8. License Field Cross Reference – The system shall allow the user to map the fields on a driver's license to the existing cardholder fields. First Name, Last Name, and Initial shall be automatically mapped fields and shall not be changed by the user. The user shall be able to create user-defined fields to match with the driver's license fields and retrieve information by scanning the guest's driver's license.
 9. Signing Out – The system shall provide for several methods of signing the Guest out of the facility, including:
 10. Once the record is marked as Signed Out, all access privileges assigned to the Guest and to their badge shall be removed so that additional usage shall be denied.
 11. If an access control badge is assigned, but is lost during the Guest's visit, the operator shall be able to find the Guest record by typing in the name of the Guest. Once the record is retrieved, the operator shall mark it as Signed Out. All access privileges shall be blocked and the operator shall record the fact that the badge were lost and was not returned.
 12. The system shall provide the optional recording of a digital photograph of the Guest as they signed in or out of the facility. This photograph shall be saved with the guest record and shall be used for verification purposes as well as comparison and reporting.
 13. The system shall be equipped with a Search feature, to access the signed out records easily.
- H. Access Control Templates: The system shall provide a quick and easy way to assign area access rights to guests. This shall be implemented via the use of access control templates. Each template shall contain conventional description and notes fields. Then the user shall be able to select either the hours after sign-in option or the time of sign-in day option.
1. If the hours after sign in option is selected, then the guest shall be expired after the number of hours specified after they were signed in. If the time of sign-in day option is selected, the guest's access rights shall be expired at the specified time of the sign-in day. The user shall also be able to specify the area sets the guest access template will use. The user shall be able to select as many area sets as needed.
 2. After these templates are defined, the Guest Pass operator shall select them to make authorization much simpler. The operator shall only need to select one record instead of defining access time and area sets.
 3. Automatic Guest Sign-in and Sign-Out - The system shall allow the user to define specific readers as sign-in and sign out readers. This shall allow a pending guest signed into the system with a single card swipe and an existing guest signed-out of the system in the same way.

- I. Guest Pass Web Interface: The system shall offer a browser-based web interface to allow an employee to request that a guest be permitted to enter a facility.
 - 1. The web page shall contain a form where the user can enter required information to add a new guest. Once the user submits this information, a new pending guest record shall be created in the system (Guest Pass client). The administrators may use the Guest Pass System to view this information and make appropriate changes.
 - 2. The web interface shall be a simple form, displaying empty fields required to register a guest. The required fields shall be marked with a * sign.
 - 3. The form shall not be submitted, until all the required information has been entered. Once the required information is entered and the form is submitted, the guests added shall be displayed in the pending guests tab in the Guest Pass Client after the views are dynamically refreshed.
 - 4. This form shall be available on authorized client workstations and can be submitted in several ways.
 - 5. The form will be available via an HTML page on the company's intranet or via the Internet and can be submitted via HTML.
 - 6. The form can be opened, completed, and submitted via e-mail.
 - 7. The form may be printed and handed to an authorizing person for signature or approval before final submission to the Guest Pass system.

- J. Web Page Security: The web page shall be secured using Windows 2000 security. The web directory where the Guest Pass Active Server Pages (ASP) will be located shall be secured to specific NT users, giving limited access to the page and to its functionality. There shall be NO login or verification once the user has access to the web pages.
 - 1. Simple Setup for Multiple Databases – The Guest Pass Web Page shall easily be setup to connect to any Schlage Security Management System Database existing on the network. As long as the IIS server has access to the SQL Server database, the Web Page shall be posted to it.
 - 2. Report Generation
 - 3. The system software shall be able to generate reports of Alarm History, Archive History, Audit Trail, Cardholder Transactions, Guest Pass History and Transaction History Reports. The user may print and/or export these reports to other applications, store to disk or send to mail recipients, as well.
 - 4. The system shall provide 53 predefined reports making for a simple and efficient end user experience. There shall be a menu presented to the person requesting the report, prompting him/her to enter the parameters necessary to retrieve the desired information (i.e. date, time, location(s), type(s) of alarms etc.)
 - 5. The user shall also be able to derive 73 pre-defined sub reports by defining their own criteria. This type of reports shall require selections to be entered that define the user created sub report. Some examples of criteria may be cardholders by category, transactions in a particular area etc.
 - 6. The system shall also allow the end user to create custom defined reports with variable selection, using a third party application like crystal reports.
 - 7. When requesting a report, the user shall be able to view a "screen preview" of the alarm activity before directing the report to a printer. For cases when the same report is run repeatedly, the user shall have the ability to "save"

the report parameters and format so that it is not necessary to reenter the parameters.

8. The reports may be secured using operator login i.d. and password.
- K. Scheduled Reports: The system shall allow the user to create pre-defined reports on a scheduled basis. The system shall provide the user with a wizard that guides him/her through the process of selecting a report, creating a schedule and assigning a printer. The user shall be able to generate the reports and print them on a weekly or daily basis at a specific time period. Any report that is created in the system shall be assigned a schedule.
 1. The system shall allow the user to store e-mail addresses of recipients of reports and send transaction history reports periodically.
- L. System Wide Features:
 1. Context Sensitive Help: System shall provide context sensitive help for all the modules. It shall be accessed from Help>Contents and Index. The help for a specific module shall be accessed by clicking F1 from the specific module.
 2. Wizards – The software shall provide step-by-step wizards for easy programming of the entire system.
 3. Pull down Menus – The system programming shall be menu driven and include tool bar icon for all major options in the menu.
 4. Onscreen help – The software shall provide onscreen description of all the actions that the user has to perform while programming the system.
 5. Search and Advanced Find – The system shall include a simple search feature for the user to easily find data in the database. The system shall also provide functionality that helps the user to further customize the search criteria and make the search more precise. The user shall be able to use Boolean logic to run highly precise and more complex searches. The system shall also be capable of saving the search criteria that the user defines.
 6. Right Click Options: The system shall provide right click options for most of the system functionalities.

FLOOR SELECT ELEVATOR CONTROL

- A. Elevator access control shall be integral to security access.
 1. The system shall be able to control an unlimited number of elevators and each elevator may have an unlimited number of floors. The elevator reader interface shall be connected to the same field panel as the digital inputs and digital outputs used to control the elevator cab. There shall be no limit to the number of elevator cabs that can be controlled via the system host software.
 2. System shall be capable of providing full elevator security and control through dedicated Controllers without relying on the control-station host PC for elevator control decisions.
 3. Access-control system shall enable and disable car calls on each floor and floor select buttons in each elevator car, restricting passengers' access to the floors where they have been given access.
 4. System setup shall, through programming, automatically secure and unsecure each floor select button of a car individually by time and day.

Each floor select button within a car shall be separately controlled so that some floors may be secure while others remain unsecure.

5. When a floor select button is secure, it shall require the passenger to use his/her access code and have access to that floor before the floor select button will operate. The passenger's credential shall determine which car call and floor select buttons are to be enabled, restricting access to floors unless authorized by system's access code database. Floor select button shall be enabled only in the car where the credential holder is the passenger.
- B. Security access system shall record which call button is pressed, along with credential and time information.
1. System Controller shall record elevator access data.
 2. The Controller shall reset all additional call buttons that may have been enabled by the user's credential.
 3. The floor select elevator control shall allow for manual override either individually by floor or by cab as a group from a workstation PC.

SECURITY TOUR SYSTEM

- A. Guard tour module shall provide the ability to plan, track, and route tours. Module shall input an alarm during tour if guard fails to make a station. Tours can be programmed for sequential or random tour-station order.
1. Guard tour setup shall define specific routes or tours for the guard to take, with time restrictions in which to reach every predefined tour station.
 2. Guard tour activity shall be automatically logged to the central-station PC's hard drive.
 3. If the guard is early or late to a tour station, a unique alarm per station shall appear at the Central Station to indicate the time and station.
 4. Guard tour setup shall allow the tours to be executed sequentially or in a random order with an overall time limit set for the entire tour instead of individual times for each tour station.
 5. Setup shall allow recording of predefined responses that will display for the operator at the control station should a "Failed to Check-in" alarm occur.
- B. Guard tour module shall allow proprietary direct-connected systems to use security access-control hardware to perform guard tour management in real time.
- C. System shall be a Windows Client application that shall allow definition of tours, real-time tracking of running tour progress, alerts when tour criteria is not satisfied, and historical reporting of previously run tours. System shall have two modules; the Security Tour Editor and the Security Tour Client. The administrator shall have the ability to define as many tours as required using the Security Tour Editor module.
1. System shall be responsible for holding all running tours in memory. It shall provide a status of all running tours upon request and monitor tour activity by communicating with the System Processor for transactions.
 2. Additionally, the Security Tour Service shall allow the addition of new running tours, pausing, resuming, and stopping of currently running tours.
- D. Guard tour and other system features shall operate simultaneously with no interference.

- E. Guard Tour Module Capacity: 999 possible guard tour definitions with each tour having up to 99 tour stations. System shall allow all 999 tours to be running at same time.

VIDEO AND CAMERA CONTROL

- A. Control station or designated workstation displays live video from a CCTV source.
 - 1. Control Buttons: On the display window, with separate control buttons to represent Left, Right, Up, Down, Zoom In, Zoom Out, Scan, and a minimum of two custom command auxiliary controls.
 - 2. Provide at least seven icons to represent different types of cameras, with ability to import custom icons. Provide option for display of icons on graphic maps to represent their physical location.
 - 3. Provide the alarm-handling window with a command button that will display the camera associated with the alarm point.
- B. Display mouse-selectable icons representing each camera source, to select source to be displayed. For CCTV sources that are connected to a video switcher, control station shall automatically send control commands through a COM port to display the requested camera when the camera icon is selected.
- C. Allow cameras with preset positioning to be defined by displaying a different icon for each of the presets. Provide control with Next and Previous buttons to allow operator to cycle quickly through the preset positions.

EXECUTION

IDENTIFICATION

- A. Using cable and asset management software specified in Part 2, develop Cable Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable, and label cable and jacks, connectors, and terminals to which it connects with same designation. Use logical and systematic designations for facility's architectural arrangement.
- B. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
- C. All wiring conductors connected to terminal strips shall be individually numbered, and each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with the name and number of the particular device as shown.
 - 1. Each wire connected to building-mounted devices is not required to be numbered at the device if the color of the wire is consistent with the associated wire connected and numbered within the panel or cabinet.

LIFE CYCLE ACTIVITIES

- A. Commissioning: All system components shall be commissioned as to conform to the manufacturer's recommendations for maximum life cycle.

- B. Operation and Use: Provide, in writing, Operation and Use procedures for each system component. Such procedures shall be written in order to conform to the manufacturer's recommendations for maximum life cycle.
- C. Maintenance: Provide, in writing, Maintenance procedures for each system component. Such procedures shall be written in order to conform to the manufacturer's recommendations for maximum life cycle.

WARRANTY

- A. Special Warranty
 - 1. Proximity Access Cards and Readers: Proximity card and readers shall provide a lifetime warranty against workmanship and defects.
 - 2. System Components: One (1) year from date of Substantial Completion.
 - 3. Labor: One (1) year from date of Substantial Completion.
- B. Extended Correction Period: On system components that require an extended correction period after Substantial Completion, the above Warranty shall commence at the end of the extended correction period.

END OF SECTION



SPECIFICATION STANDARDS

28 20 00 ELECTRONIC SURVEILLANCE

GENERAL

- A. The equipment installed by *Spectrum Sales NC* will meet or exceed the following:
 - 1. DVR
 - 2. Cameras
 - 3. Power Supplies
 - 4. Cabling

PRODUCTS

- A. DVRs
 - 1. Features:
 - a. H.264E Compression. BlackFin Video Processors
 - b. Embedded High-Speed Motorola Microprocessor & Linux OS
 - c. 4-ch Real-time Synchronized Video and Audio Recording
 - d. HDMI Interface for high resolution video output
 - e. Email notification of events
 - f. Up-to D1 (4CIF) recording/playback quality
 - g. Video loopout for every camera
 - h. Matrix video output for spot monitor applications
 - i. Support VGA connection to computer monitors
 - j. USB 2.0 Mouse Interface for mouse and local download
 - k. IR Remote Control
 - l. Two way audio
 - m. Motion detection on every channel
 - n. Direct network access using IE Browser
 - o. Central management software for viewing/managing multiple DVRs
 - p. Up to 8 TeraBytes (8,000G) Internal Storage Min 250gb
 - q. Minimum 2 week record time
 - r. Rack Mountable
 - s. LED/LCD time and record status display
 - t. Ultra Low Power consumption
 - u. 3 Year DVR/5Year HDD Warranty
 - 2. Specifications:
 - a. Main Board Processor: AMD SC1200/266 Multi-Media microprocessor.
 - b. Video Processor: BlackFin (ADI) video processors.
 - c. Operation System: Embedded LINUX.
 - d. Video Standard: NTSC (525 line, 60f/s), PAL (625 line, 50 f/s).
 - e. Video Compression: H.264E (MPEG4 Part 10 - Enhanced).
 - f. Video Input: 16 Channel.
 - g. Video Input Signal: NTSC/PAL, BNC (1.0Vp-p,75 Ω).
 - h. Video Output: HDMI,2 BNC (1.0Vp-p, 75 Ω), VGA (Computer Monitor).
 - i. Video Loopout: 16-ch (one for each camera) BNC.

- j. Matrix Video Port: 1 matrix video output port.
- k. Audio Compression: ADPCM G.723 8K.
- l. Audio Input: 4 Channel.
- m. Audio Input Signal: 4 BNC (200-2000mV,10K Ω).
- n. Audio Output: 2 BNC (200-3000mV, 5KΩ).
- o. System Resource: Pentaplex function: live, recording, playback, backup & remote access.
- p. Image Resolution: Live view 704x480, Playback 704x480, VGA output 1024x768(NTSC).
- q. Motion Detection: Area setting: 225 detection areas on the screen; detection sense setting: 3.
- r. Video Recording Speed: 1-30 fps Variable per channel (NTSC).
- s. Total Recording Speed: 30 Frames Per Second per Channel; 480 FPS Per DVR.
- t. Image Quality: 6 Levels selectable.
- u. Hard Disk: 4 SATA ports, up-to 6TB per DVR.
- v. USB Port: 2 USB2.0 ports - support USB mouse and USB storage devices.
- w. Hard Usage: Video: 56-900M/Hour, Audio: 14.4M/Hour.
- x. Internal DVDRW: Support built-in DVDRW drive for data backup (Optional).
- y. Alarm Output Ports: 3 channels output, output in open/close contact (the third channel is controllable +12V output).
- z. Alarm Input Ports: 16 Channels.
- aa. Alarm Relay: 30VDC 1A, 125 VAC 0.5A (relay output).
- bb. Network Connection: RJ45 10M/100M Ethernet connection.
- cc. Modem Connection: RS232.
- dd. Pan-tilt Control: RS485.
- ee. Power: 110VAC / 220VAC.
- ff. Power Consumption: 25Watt (w/o HD).
- gg. Working Temperature: 0°C ~ +55°C (32°F~ 130°F).
- hh. Working Humidity: 10% - 90%.
- ii. Barometric Pressure: 86kpa - 106kpa.
- jj. Physical Dimension: 1.5U, 440mmx460mmx68mm (W*D*H).
- kk. Weight: 13.2 LB (without HD).

B. Interior Camera.

- 1. Features:
 - a. 1/3" SSNR II Sony Super HAD CCD
 - b. 3.3-12mm Aspherical Extra-Low Dispersion Glass Vari-focal Lens
 - c. Highly enhanced resolution of 540TVL(Day) & 570TVL(Night)
 - d. 0.3 Lux /F1.2 (50IRE, AGC High, DNR High) / 0.0002 Lux (Sens-up)
 - e. Wide range of Automatic White Balance (1,800° K~ 10,500°)
 - f. Dual switching power (w/Auto Line-lock) DC12V/AC24V
 - g. 3 Layer IR Filter
 - h. Serve Ease™ Swappable Internal Camera Module
 - i. 3 Year Warranty
- 2. Specifications:
 - a. Image Sensor: 1/3" SSNR II Sony Super HAD CCD
 - b. Effective Pixels: NTSC: 768(H)X494(V), PAL : 752(H)X582(V)
 - c. H. Resolution: NTSC: 540TVL(Day) & 570TVL(Night)

- d. Video Output: 1.0Vp-p Composite. 75 Ohms
- e. Min. Illumination: 0.3 Lux /F1.2 (50IRE, AGC High, DNR High) 0.0002 (Sens-Up)
- f. Shutter Speed: AUTO: 1/60~1/100,000 sec (NTSC), 1/50~1/100,000 sec (PAL)
- g. Scanning System: 2:1 Interlace
- h. S/N Ratio: 50dB (AGC Off)
- i. Lens: 3.3-12mm Extra-Low Dispersion Glass Vari-focal Lens
- j. OSD: Built-in
- k. SNR: Low, Middle, High, Off Selectable (Super Noise Reduction)
- l. Backlight Compensation: Low, Middle, High, Off Selectable
- m. Gain Control: Low, Middle, High, Off Selectable
- n. Mirror: ON/OFF
- o. Sharpness: ON/OFF (Level Adjustable)
- p. Privacy: ON/OFF (4 Zones)
- q. Power source: AC24V / DC 12V
- r. Operating current: At 12VDC : 200mA Max - (Tol.9VDC~30VDC)
- s. Operation Temperature: 10 C to + 50 C
- t. Operative Humidity: 30% to 80% RH
- u. Dimension: 140mm(Diagonal) x 100mm (Vertical Height)
- v. Weight (Approx.): 250g

C. Interior Area High Contrast Camera.

- 1. Features:
 - a. High performance 1/3" Pixim WDR digital imaging
 - b. 3.3-12mm Aspherical Extra-Low Dispersion Glass Vari-focal Lens
 - c. High resolution of 540 TVL at Day / 560 TVL Night
 - d. Greatly enhanced Sensitivity of 0.03 Lux at F1.2
 - e. Super Wide Dynamic Range (S WDR)
 - f. Dual-voltage power supply (with auto line-lock) DC12V or AC24V
 - g. 3 layers of IR filter
 - h. Easy to use OSD function
 - i. Mechanical IR filter eliminates color interference in the night
 - j. 3 Year Warranty
- 2. Specifications:
 - a. Image Sensor: High performance 1/3" Pixim WDR digital imaging device
 - b. Effective Pixels: NTSC : 768(H)X494(V), PAL : 752(H)X582(V)
 - c. H.Resolution: High resolution of 540 TVL at Day / 560 TVL Night
 - d. Signal Processing: 17-bit Digital Signal Processing (max)
 - e. Transfer Format: PSF (Progressive with Segmented Frames)
 - f. Video output: 1.0Vp-p Composite. 75 Ohms
 - g. Min. Illumination: 0.3 Lux at F1.2 (DSS off) / 0.03 Lux at F1.2 (DSS on)
 - h. Shutter Speed: AUTO: 1/60~1/100,000 sec (NTSC), 1/50~ 1/100,000 sec (PAL)
 - i. Scanning System: 2:1 Interlace
 - j. S/N Ratio: 50dB (AGC Off)
 - k. Lens: 3.3-12mm Extra-Low Dispersion Glass Vari-focal Lens
 - l. SNR: Auto
 - m. Gain Control: Off, Low, Middle, High
 - n. Backlight Compensation: Off / On, adjustable Backlight Zone

- o. Sharpness: Off, Low, Middle, High
- p. Digital slow shutter: Off / 2x / 4x / 6x / 8x / 16x / 32x
- q. WDR: Auto / Off / Low / Middle / High
- r. Privacy Masking: On / Off (6 Programmable zones)
- s. Reversal: NOR / MIR / VER / FLIP
- t. Protocol: Pelco-D
- u. Power source: Duo Power Input: AC24V / DC 12V
- v. Operating current: 200mA at 12VDC, 110mA at 24VAC
- w. Operating Temperature: 14 ° F~122 ° F (-10 ° C ~+ 50 ° C)

D. Exterior Bullet:

- 1. Features:
 - a. Sony 1/3" Super HAD CCD Sensor
 - b. 580 TVL Resolution
 - c. 3.5 ~ 10mm Vari-Focal Lens with external adjustments
 - d. IP-67 Weatherproof
 - e. 20 Long Range IR (viewable distance up to 65ft)
 - f. 3 Year Warranty
- 2. Specifications:
 - a. Image Pick-Up Device: 1/3" SONY SUPER HAD CCD
 - b. Effective Pixels: NTSC 768(H)*494(V)
 - c. Resolution: 580TV Line Day/620 TVL Night
 - d. Minimum Illumination: 0.1 Lux at F1.6
 - e. Electronic Shutter Speed: Auto/Manual(1/60sec~1/100,000)
 - f. Gamma Correction: $\gamma=0.45$
 - g. White Balance: 2100K~9100K Automatic Tracking White Balance
 - h. Gain Control: 0dB~32dB Auto
 - i. Smear Effect: 0.005%
 - j. Power Supply: DC 12V
 - k. Power Consumption: 120mA (DC 12V)
 - l. Lens: 3.5~10mm Varifocal Lens with external adjustments
 - m. Operating Temp: 14 ° F ~ 122 ° F (-10 ° C ~ +50 ° C)
 - n. Humidity: Within 90% RH
 - o. Dimension: 3.2"(W)x 2.83"(H)x 6.89"(L) /81mm X 72mm X 175mm
 - p. Weight: 1.8lb

E. External Dome:

- 1. Features:
 - a. 1/3" SSSNR II SONY Super HAD CCD
 - b. 3.3-12mm Aspherical Ultra-low dispersion glass vari-focal lens
 - c. Highly enhanced resolution of 500 TVL (day)/560 TVL (night)
 - d. 0.1 Lux at F1.4 w/o LED, 0 Lux with LED
 - e. Magna Axis (World's first tool-less magnet adjustment)
 - f. 3 Layer IR Filter
 - g. Serve Ease Swappable Internal camera module with Magna Axis
 - h. Dual Switching Power - DC12V/AC24V
 - i. Spot Monitor Output
 - j. Wide range of automatic white balance
 - k. 3 Year Warranty

2. Specifications:
 - a. Image Sensor: 1/3" SSNR II SONY Super HAD CCD
 - b. Signal Format: NTSC / PAL
 - c. Effective Pixels: NTSC: 768(H)x494(V), PAL: 752(H)x582(V)
 - d. H. Resolution: 500 TVL (day)/560 TVL (night)
 - e. Video Output: Composite 1.0Vp-p at 75 Ohm
 - f. Min. Illumination: 0.1 Lux at F1.4 w/o LED, 0 Lux with LED
 - g. Auto Shutter (AES): 1/60 ~ 1/100,000 sec.
 - h. Gamma Correction: 0.45
 - i. White Balance: Auto 2100 ~ 9100K
 - j. Scanning System: 2:1 Interlace
 - k. Super Noise Reduction: Auto
 - l. Backlight compensation: Auto
 - m. Gain Control: Auto
 - n. S/N Ratio: 50dB (AGC Off)
 - o. Sharpness: Auto
 - p. Lens: 3.3-12mm Aspherical Ultra-low dispersion glass vari-focal lens
 - q. IR LED: 850nm - 8x40 x 10 unit
 - r. Power Source: AC24V/DC12V
 - s. IR Beam Distance: 60 feet
 - t. Operation Current: 400mA at DC12V, 190mA at AC24V
 - u. MTBF: 20K Hours
 - v. Working Temperature: -10°C ~ +50°C
 - w. Working Humidity: 30% - 80%
 - x. Dimensions: 150 (L) x 115.7(D) mm
 - y. Net Weight: 1400g (3lb)

F. Pan/Tilt/Zoom cameras:

1. Features:
 - a. 1/4" Sony EX-VIEW CCD 480 TV Lines
 - b. High Accuracy with Micro-Stepping Control Technology
 - c. Smooth Proportion Motion at High Zoom Magnification Mode
 - d. 216X Digital Zoom (18X Optical)
 - e. High Speed (300°/sec) & Smooth Manual Speed (MIN. 0.05°)
 - f. Low Noise & Low Vibration
 - g. Auto IR Cut Filter for Day & Night Operations
 - h. 8 Smart Privacy Masking Zones
 - i. 8 Programmable Group Tours
 - j. 5 Configurable Patterns
 - k. 7 Alarm Input and 1 Relay Output
 - l. Built-in Voltage-surge Protection
 - m. RS485 communication w/ selectable protocol
 - n. 3 Year Warranty
2. Specifications:
 - a. Image Sensor: 1/4" Sony EX-VIEW CCD
 - b. Resolution: 480 TVLines
 - c. Camera: Sony 18X Optical Zoom Camera
 - d. IR Filter: Day & Night (IR Cut Filter)

- e. Motor: High Accuracy with Micro-Stepping Motor(low noise, low vibration)
 - f. Pan Speed: Endless 360° Pan Rotation at 300° /sec
 - g. Manual Pan Speed: MIN. 0.05°/sec
 - h. Preset: 128 with Alphanumeric labels
 - i. Scan, Tour, Patten: 5 Pattern, 8 Tour and 8 Scan Functions
 - j. Privacy Zone: 8 Privacy Zones (Spherical Coordinates)
 - k. Others: Auto Flip
 - l. Weatherproof: IP67
 - m. Case: Vandal-Proof case
 - n. OSD: On-Screen Display on/off
- G. Power supplies:
- 1. Features:
 - a. Sixteen (16) fused protected outputs
 - b. Electronically regulated outputs
 - c. Output fuses are regulated at 500 milliamps
 - d. 115 VAC 50/60 Hz 1.45 amp input
 - e. Input fuse is rated at 3.5 amp
 - f. Surge suppression
 - g. AC/DC power LED indicator
 - h. Unit maintains camera synchronization
 - i. UL listed
 - j. Lifetime Warranty
 - 2. Specifications:
 - a. 12" H x 12" W x 4" D
 - b. 1/2" and 2/3" combination knockouts
- H. Cabling
- 1. Video and power:
 - a. RG59/U Siamese Cable
 - b. UL Certified RG59/U Siamese Cable
 - c. Coax Solid Bare Copper Conductor 20 AWG
 - d. Unshielded 18 AWG Twisted Pair for Power
 - e. Plenum where required
 - 2. B. RS-485/Network integration:
 - a. Cat5/e or Cat6/ae depending on network infrastructure.
 - 3. Connectors:
 - a. 75ohm BNC compression connector (Video)
 - b. B-CONNECTOR w/ GEL FILL (power/data)
 - c. RJ-45 (network)

Information current as of April 22, 2010.

END OF 28 20 00



SPECIFICATION STANDARDS

31 25 13 - EROSION CONTROL

GENERAL

Compliance considerations: The Designer shall use the State of North Carolina Erosion and Sediment Control Planning and Design Manual to plan and design erosion control measures for all CCS construction sites.

END OF 31 25 13



SPECIFICATION STANDARDS

31 31 16 - TERMITE CONTROL

GENERAL

This section contains information on termite control.

PRODUCTS

- A. **SOIL TREATMENT SOLUTION:** Use a non-repellent emulsible concentrate termiticide for dilution with water, specially formulated to prevent infestation by termites. Provide a solution recommended by Applicator and acceptable to Designer and approved for intended application by the manufacturer and registered and approved by EPA and the N. C. Department of Agriculture, Structural Pest Control Division. Use only soil treatment solutions which are not injurious to planting (i.e. TERMIDOR 80WG).

- B. Acceptable products include those listed below. Use of other products must be approved by CCS.
 - 1. Termidor 80 WG
 - 2. Premise 75

EXECUTION

SURFACE PREPARATION: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if recommended by toxicant manufacturer.

Mixing: Mix emulsible concentrate termiticide into solution on site with confirmation by the Owner's testing laboratory.

Apply according to manufacturer's recommendations as approved by the Designer. All Cabarrus County Schools shall be treated at labeled rates. Recommended treatment rate is 10 gallons per 100 square feet. Note: Designer to require Contractor to contact Cabarrus County Schools Maintenance Department seven days prior to treating soil to coordinate witnessing of soil treatment. Termite treatment of renovated CCS occupied areas will not occur during school hours.

After application, the contractor shall request soil samples be taken by the North Carolina Department of Agriculture Structural Pest Control Division (919.733.6100). The pesticide recovery level must meet their minimum requirements prior to proceeding with construction.

Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

RE-TREATMENT AND REPAIR: If subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation, without cost to the Owner, and to the satisfaction of the designer.

The Pest Control Subcontractor shall pay the entire cost of re-treatment if required by the North Carolina Department of Agriculture or if required to comply with these specifications including the costs of providing access to the soil, repair of resulting damage to materials, and project delays.

Warranty: See Section 01 77 00 for warranty information.

END OF 31 31 16



SPECIFICATION STANDARDS

32 30 00 - SITE AMENITIES

GENERAL

This section contains information on the following items: playground equipment, play surface, and restraining edge, flagpoles, outdoor trash receptacles, benches and raised sidewalks.

There are three playgrounds at each Elementary school. These are provided and installed by Owner.

PRODUCTS

- A. **PLAYGROUND:** all playground equipment will be installed by a separate contractor. Identified flat area is to be graded and stabilized by the General Contractor. Designer is to receive written approval for locations from the Director of Facilities.
 - 1. **PROVIDE AN ADA ACCESSIBLE ROUTE FROM THE BUILDING TO ALL THE PLAYGROUND EQUIPMENT.**
- B. **FLAGPOLE:** Seamless, tapered aluminum tubing, clear anodized finish, 30 foot exposed height, manufacturer's standard butt and top diameter. Provide complete with external cleats, halyards, truck and collar. Provide two at front of each elementary, middle and high school and two at football stadium.
- C. **TRASH RECEPTACLES:** CCS to provide powder coated molded metal, in-ground or surface mounted, 55 gallon trash receptacle with 10" to 14" flat top diameter opening. NO side option door.
- D. **BENCHES:** Cabarrus County Schools to provide powder coated molded metal in-ground or surface mounted benches.

EXECUTION

INSTALLATION: Install flagpole where indicated on the drawings, or as directed by the Owner. Provide protection of completed installations until accepted by the Owner.

END OF 32 30 00



SPECIFICATION STANDARDS

32 31 13 - FENCING

GENERAL

Fencing is required for security around exterior mechanical equipment areas, for security and at sport functions such as tennis courts, high school baseball and softball fields. Where equipment enclosure fencing is adjacent to main buildings it is desirable for fence construction to match building construction. Provide chain link fences and gates as complete units obtained from a single source including necessary erection accessories, fittings and fastenings.

PRODUCTS

- A. CHAIN LINK FENCING: Galvanized steel chain link fence and gates with all accessories, fittings, and fastenings to be obtained from the fence manufacturer. Fabric of fence shall have knuckled selvage at both top and bottom. Do not extend fabric above top rail. Knuckles to be turned down.
1. Manufacturers acceptable for use are:
 - a. Allied Tube and Conduit Corp.
 - b. American Fence Corp.
 - c. Anchor Fence, Inc.
 - d. Page Fence Div/Page-Wilson Corp.
 - e. Cyclone Fence/United States Steel Corp.

END OF 32 31 13



SPECIFICATION STANDARDS

32 84 24 - IRRIGATION SYSTEM

GENERAL

Irrigation systems shall be installed on all athletic fields.

PRODUCTS

Use backflow preventer per local jurisdiction.

Use metered water supply so the amount of water used for irrigation can be subtracted from main meter to save sewage charges. (See Section 22 05 23)

Use Toro or Smith heads and control panel.

Use triple elbow swing joints at all heads.

Use hydraulic valve in head gear driven rotor pop-up adjustable nozzle Toro heads.

Irrigation supply line - PVC SDR 21/PR200 type 1, grade 1 with PVC schedule 40 solvent weld fittings.

Copper pipe shall be used from main to meter and for 10 ft. on Owner's side of meter.

END OF 32 84 24



SPECIFICATION STANDARDS

32 92 19 - GRASS SEEDING

PRODUCTS

- A. **LAWN GRASS SEEDING:** shall be 7 lbs. of blended tall Fescue/1,000 sq. ft. in March 1 to May 1, or August 15 to September 1. When seeding after September 1, add 25 lb/acre of small grain rye through November 1, or from Feb. 15 to May 1. From May 1 to August 15, add 10 lbs/acre of millet.
- B. **HIGH SCHOOL AND MIDDLE SCHOOL ATHLETIC FIELD GRASS SPRIGGING:** shall be hybrid Bermuda Tifton 419.
 - 1. **Temporary Cover**
 - a. Rye grain can be planted during fall and winter months for temporary cover at a rate of 120 lbs/acre from Aug. 15 to Dec. 30 or Jan 1 - May 1.

EXECUTION

SEEDBED PREPARATION: After weed eradication, rough grading and seedbed cleaning is done, a soil analysis shall be paid for by the General Contractor and reviewed by Designer, and based on the results, the proper amounts of limestone, basic fertilizers and any soil improving additions shall be well mixed into the top 4 to 6 in. of soil. This can be accomplished with a rotary tiller, disking, plowing or even spading. Amount of limestone for each application should be determined through soil testing. Following rate of basic inorganic fertilizers are recommended for seedbed preparation.

All disturbed areas that are to be seeded or sodded shall have 2-3 inches of clean, screened topsoil applied to the surface prior to seed or sod application. Contractor shall provide 95% coverage of all lawn and field areas prior to substantial completion.

It is essential that a well-established stand of grass is present when school first begins.

FINAL GRADING AND STARTER FERTILIZER: Contractor to check slope to verify it complies with CCS standards and shall remove all foreign materials and stones larger than 1/2 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 1/4 in. deep.

Apply starter fertilizer at a rate that will provide 1 to 1-1/2 lbs. of actual nitrogen/1000 sq. ft. Rake starter fertilizers into soil surface about 1 in. deep and proceed with grass seeding.

WATERING: From time of seeding to substantial completion the Contractor shall keep maturing grass watered on a regular basis. This shall be a minimum of once a day until two (2) weeks after date of seeding. Thereafter, watering shall be done a minimum of once every week or as required to sustain ground cover.

Warranty: See Section 01 77 00 for warranty information.

END OF 32 92 19



SPECIFICATION STANDARDS

32 93 00 - LANDSCAPE PLANTING

GENERAL

All plants shall be native species and of a hearty, durable variety and requiring minimum watering and maintenance.

All planting is to be in compliance with the Cabarrus County Unified Development Ordinance.

PRODUCTS

- A. TREE, SHRUB AND GROUND COVER PLANTING: Drought-tolerant species shall be specified where possible.
- B. Mulch for trees and shrubs is specified as follows:
Raw Material – Mulch material should be comprised of at least 80% hardwoods, with moisture content of 30% or less, and pass through a maximum screen size of 1 5/8". Raw material should contain no yard waste, construction debris, or any other extraneous material.

EXECUTION

- A. TREE, SHRUB, AND GROUND COVER PLANTING: shall have 8 in. minimum deep plant beds with incorporation of 2 in. of decomposed organic matter. All plant beds shall receive an application of pre-emergent "herbicide" before area is mulched. All trees and shrubs shall be mulched with a minimum of 3 in. of brown-dyed mulch.
- B. Where slopes exceed 1 in 3 it is recommended ground cover such as Parson Juniper be planted and mulched with a minimum of 3 in. (after compaction) of triple shredded hardwood mulch or a non-mow vegetation (i.e., weeping lovegrass).
- C. All shade trees shall be placed in a manner so that mature size limbs will not overhang buildings or power lines. At driveway and parking areas all trees shall be at height at installation that they will not obstruct motorists' line of sight.
- D. All shrubs placed near buildings shall be selected from varieties so that at mature height the planting will not overgrow or obstruct vision from windows. At driveway and parking areas shrubs shall be selected from varieties so that at mature height the planting will stay below the motorists' line of sight.

- E. All trees shall be stabilized by using 3 stakes and guy wires. Attach guy wires to tree using fabric straps. Locate wood stakes inside of mulch bed to avoid conflict with lawn mowers. Contractor to be responsible for removal of stakes, straps and guys after one year.
- F. Potted pines planted for slope stabilization need to be loosely staked so that the stake can remain on them at least two years. Use tree straps only, no string or wire.
- G. Shrubs in beds adjacent to curbs need to be planted at least 3 feet from the edge of curb so buses/cars do not run over them passing each other in a narrow drive.
- H. Existing vegetation shall be utilized in the "tree count" as much as possible.

END OF 32 93 00



SPECIFICATION STANDARDS

33 42 13 - STORM DRAINAGE PIPE AND FITTINGS

GENERAL

A magnetic locator tape shall be installed at all underground non-metallic pipe installations. This tape shall be buried at a depth of 12 in. below top surface of earth and 12 in. below top of subgrade at pavements and walks.

PRODUCTS

REINFORCED CONCRETE PIPE: Shall be ASTM C 76 Class III.

POLYVINYL CHLORIDE (PVC) PIPE: Shall be ASTM D 3033, Type PSP SDR 35 or ASTM D 3034, Type PSM, SDR 35.

END OF 33 42 13



SPECIFICATION STANDARDS

33 49 13 - MANHOLES

MANHOLES:

Covers of storm drainage manholes shall be set flush with top of surrounding paving or finish grade.

Where required by local zoning ordinances mount covers of sanitary sewer manholes 12 in. above finish grade at lawn or planted areas.

Manholes and covers to meet all local and North Carolina state requirements.

CLEANOUTS:

A concrete pad shall be provided around all cleanouts.

Size of pad to be 24 in. x 24 in. x 4 in. thick.

Top of pad to be flush with finished grade.

Cleanouts shall be installed within 10 ft. of building wall, at change of direction, and upstream end, and at all underground storm drainage lines.

It is preferred that clean outs be in a walkway, if compatible with design.

END OF 33 49 13

GENERAL

Throughout this document are the building systems and materials that CCS desires to be utilized in the design/construction of all new and renovated facilities. CCS goal for all new construction is to achieve a 50% energy savings toward a net zero energy building. The minimum reduction that CCS will accept is a 30% energy savings toward a net zero energy building, as defined in *The Advanced Energy Design Guide for K-12 School Buildings, Achieving 30% Energy Savings Toward a Net Zero Energy Building*, published in 2008 by The American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc., in association with the American Institute of Designers; the Illuminating Engineering Society of North America; the U.S. Green Building Council; and The U.S. Department of Energy. As of the date of this publication a free copy may be downloaded at www.ashrae.org/publications/page/1604. CCS is in Zone 3 of this document, and specific attention is drawn to pages 40 and 41.

Here is a brief description of how to use the ASHRAE document:

1. Review Chapter 2 to understand how an integrated design approach is used to achieve 30% or greater energy savings. Checklists show how to establish and maintain the energy savings target throughout the project.
2. Use Chapter 3 to select specific energy saving measures by climate zone. This chapter provides a prescriptive path that does not require modeling for energy savings. These measures also can be used to earn credits for CHPS, LEED®, and other building rating systems.
3. Review the case studies in Chapter 4 to see how the 30% energy savings goal has been met in schools in climate zones across the country.
4. Use Chapter 5 to apply the energy savings measures in Chapter 3. This chapter has suggestions about best design practices, how to avoid problems, and how to achieve additional savings with energy-efficient appliances, plug-in equipment, and other energy saving measures.

Consider Energy Implications in Site Selection and Building Orientation:

1. Orient buildings to be able to integrate passive and active solar strategies. If renovating/retrofitting an existing structure (i.e. when employing passive solar strategies is not possible), consider planting trees to shade areas of the building that get more sunshine. Coordinate sustainable site design with site security considerations, including Crime Prevention Through Environmental Design (CPTED) strategies.
2. Take advantage of natural ventilation and prevailing wind patterns.
3. Maximize daylight use.
4. Investigate the potential impact of future adjacent developments to the site (e.g., solar and wind exposure, daylighting, ventilation, etc.).

Minimize the environmental impacts of construction and operation, during the construction phase of this project. The Contractor shall implement the following procedures singly or in combination:

1. Select Energy Star qualified products that minimize consumption of non-renewable resources, consume reduced amounts of energy and minimize pollution. Use recycled and recyclable materials.

2. Control sources for potential Indoor Air Quality (IAQ) pollutants by controlled selection of materials and processes used in project construction.

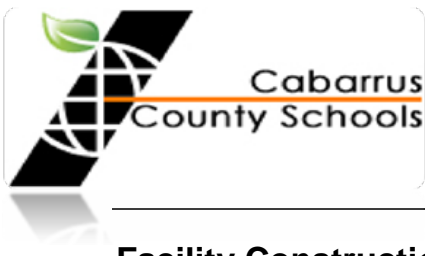
For additional energy efficient measures and renewable energy requirements refer to ANSI/ASHRAE/USGBC/IES Standard 189.1, *Standard for the Design of High Performance, Green Buildings Except Low Rise Residential Buildings*. Also refer to Standard 189.1 for requirements that can be expanded incorporating site sustainability, water use efficiency, indoor environmental air quality and the building's impact on the atmosphere, materials and resources.

EXECUTION

Cabarrus County Schools is actively seeking to make its buildings high performance. This is in order to support the school system's educational mission by:

1. Reducing Operating Costs
2. Improving Academic Performance
3. Protecting the Environment
4. Build buildings which teach Sustainability
5. Designing for Health, Safety and Comfort
6. Supporting Community Values

It is expected that the design team will take an integrated approach to high performance, thereby, able to make sensible, high performance decisions. Each project is expected to have a customized plan, developed in conjunction with the complete design team and the owner's representatives.



ARCHITECTURAL DESIGN GUIDELINES

Facility Construction: Divisions 02-14

Division 02 – Existing Conditions

Section not used.

Division 03 - Concrete

Construct control joints using pre-molded key joints, inserts, tooled joints or sawcut joints.

Minimum depth of control joints shall be one-fourth (1/4) of the slab thickness.

Maximum spacing of joints shall be 15 ft. by 15 ft.

Isolate all slabs from exterior walls.

Division 04 - Masonry

Cavity wall (masonry veneer on concrete masonry unit back-up) and veneer wall (masonry veneer on steel stud back-up with cavity space) construction is acceptable at exterior masonry walls.

Control joints, expansion joints and flashing shall be located and installed as per the recommendations of the Brick Institute of America and National Concrete Masonry Association. Tolerance and quality of workmanship shall be equal to or better than ACI 530.

Any enclosed planters must have minimum 1 in. weep holes every 6 ft.

If any wall of planted area encloses a heated space, waterproofing shall be used from footing to finished grade.

Flush masonry wall construction is preferred. No horizontal ledges will be allowed more than 1/4 inch.

Bullnose units shall be provided at corners of interior CMU wall construction, starting at 8 in. above finished floor (AFF), in high traffic areas. Where bullnose units are used 8 in. header block will be used as a starter course.

Division 07 – Thermal and Moisture Protection

WATERPROOFING

All below grade wall construction of interior spaces and elevated floor construction at toilet rooms and showers shall be waterproofed.

BELOW GRADE WALL WATERPROOFING

1. Drainage tile shall be installed with coarse crushed stone backfill at wall foundation and wrapped with a filter fabric to prevent stone blockage.
2. Connect tile drain lines to daylight at grade or storm drain lines.

ELEVATED FLOOR WATERPROOFING

1. Turn up membrane 4 in. at walls.
2. Slope floors to drain per local jurisdiction.

ASPHALT SHINGLE ROOFING

Asphalt shingles shall mainly be used to match existing roofs and on certain outbuildings, however, where required by project budget constraints, asphalt shingle roofing is acceptable, with the written consent of the Owner, for use on medium pitched roofs, 4/12 minimum slope.

Provide roof tie-off hooks every 30 feet at roof ridge as required by OSHA. Reference current edition of the North Carolina Occupational Safety and Health Standards for the Construction Industry, Section 1926.500.

MEMBRANE ROOFING

Minimum slope to point of discharge shall be 1/4 in. per foot.

All low slope roof areas shall be accessible by means of an interior roof hatch, exterior door or exterior roof ladders.

FLUID-APPLIED ROOFING

Use of fluid applied roofing will be used for restoring existing roofing systems only with Owner's written permission.

All low slope roof areas shall be accessible by means of a roof hatch, exterior door or exterior roof ladder.

FLASHING AND SHEET METAL

Details shall be in accordance with the NRCA Roofing Manual and the Designer Sheet Metal Manual by SMACNA.

Cabarrus County School System prefers the use of shop fabricated metal flashings in lieu of extruded metal flashing components.

Where roofs discharge at eaves it is recommended gutters and perimeter downspouts be installed. Built-in gutters and downspouts shall not be used; gutter shall be outside of the wall.

Scuppers shall not be used for primary discharge.

SHEET METAL ROOFING

Standing seam roofing is the preferred roof system for medium pitched roofs.

Provide roof tie-off hooks every 30 feet at roof ridge as required by OSHA. Reference current edition of the North Carolina Occupational Safety and Health Standards for the Construction Industry, Section 1926.500.

DRAINAGE: All metal panel roof areas shall drain into external gutters and downspouts.

Division 08 - Openings

WOOD DOORS

Doors shall be 1-3/4 in. thick and 7 ft. high. Generally, door design will be full flush.

HOLLOW METAL INTERIOR DOORS AND FRAMES

Heavy-duty hollow metal door and frames are required for school usage especially at high traffic areas.

Particular attention needs to be given to the preparation and reinforcement of doors and frames for finish hardware.

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

Interior stair/corridor doors shall have vision lights as allowed by the NC State Building Code.

Swinging interior "A" label and "B" label double doors shall be hollow metal unless otherwise approved by the Owner.

All interior doors frames and sidelight frames shall be hollow metal unless otherwise approved by the Owner.

DOOR AND FRAME LAYOUT

It is recommended for exterior, main entrance doors to be multiple single doors swinging in the same direction.

Do not use double doors except with keyed removable mullions and for equipment rooms.

BOILER ROOMS shall have exterior doors only.

MAIN MECHANICAL EQUIPMENT ROOMS shall have exterior doors where possible.

SPECIAL DOORS

Overhead roll-up doors and grilles are acceptable to limit access to certain areas of the facility but shall not interfere with required egress from occupied spaces.

ENTRANCES AND STOREFRONTS

DOOR LAYOUT

It is recommended for exterior, main entrance doors to be multiple single doors swinging in the same direction.

Do not use pairs of doors on exterior openings except with exit devices used with a keyed removable mullion.

METAL WINDOWS

Windows in all hallways need to meet requirements of Windborne-Debris-Impact Resistance for Wind Zone 1:

1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.
2. Small-Missile Test: For glazing located more than 30 feet (9.1 m) above grade.

Windows at classrooms and other occupied spaces shall include operable sections. Casement windows are the preferred system. Crank or gear driven operable sash windows shall not be used.

Sill height and window size should consider size of students. Large sizes of glass are discouraged. There shall not be any special, complex glass designs.

A horizontal frame approximately 30 in. above finish floor shall be provided at sidelights to guard students against walking into glass.

GLAZING

Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer, using the following design criteria:

1. Design Wind Pressures: As indicated on Drawings.
2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.
3. Maximum Lateral Deflection: For glass supported on all 4 edges, limit center of glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1", whichever is less.

Refer to Division 01 Section 01 81 13 "Sustainable Design Requirements" for requirements as defined in *The Advanced Energy Design Guide for K-12 School Buildings, Achieving 30% Energy Savings Toward a Net Zero Energy Building*, published in 2008 by The American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc., in association with the American Institute of Designers; the Illuminating Engineering Society of North America; the U.S. Green Building Council; and The U.S. Department of Energy.

Glass in all hallways needs to meet requirements of Windborne-Debris-Impact Resistance for Wind Zone 1.

Insulating glass shall be installed at exterior windows. It is recommended solar tinted or low "E" glass be used at exterior glass at east, west, and unprotected south facing windows.

Tempered or fire rated glazing product glass shall be installed at and adjacent to doors as required by the NC State Building Code.

It is recommended interior glazing 6 ft. or less above the finish floor and exterior glazing 6 ft. or less above walkway surfaces be tempered.

Division 09 - Finishes

GYPSUM WALLBOARD

Confine use of gypsum board faced partitions to administration and Student Support areas and for walls between classrooms.

TILE

Use ceramic tile in all bathroom toilet areas and up to partition high on all “wet walls” and stall walls. Also use on all kitchen walls.

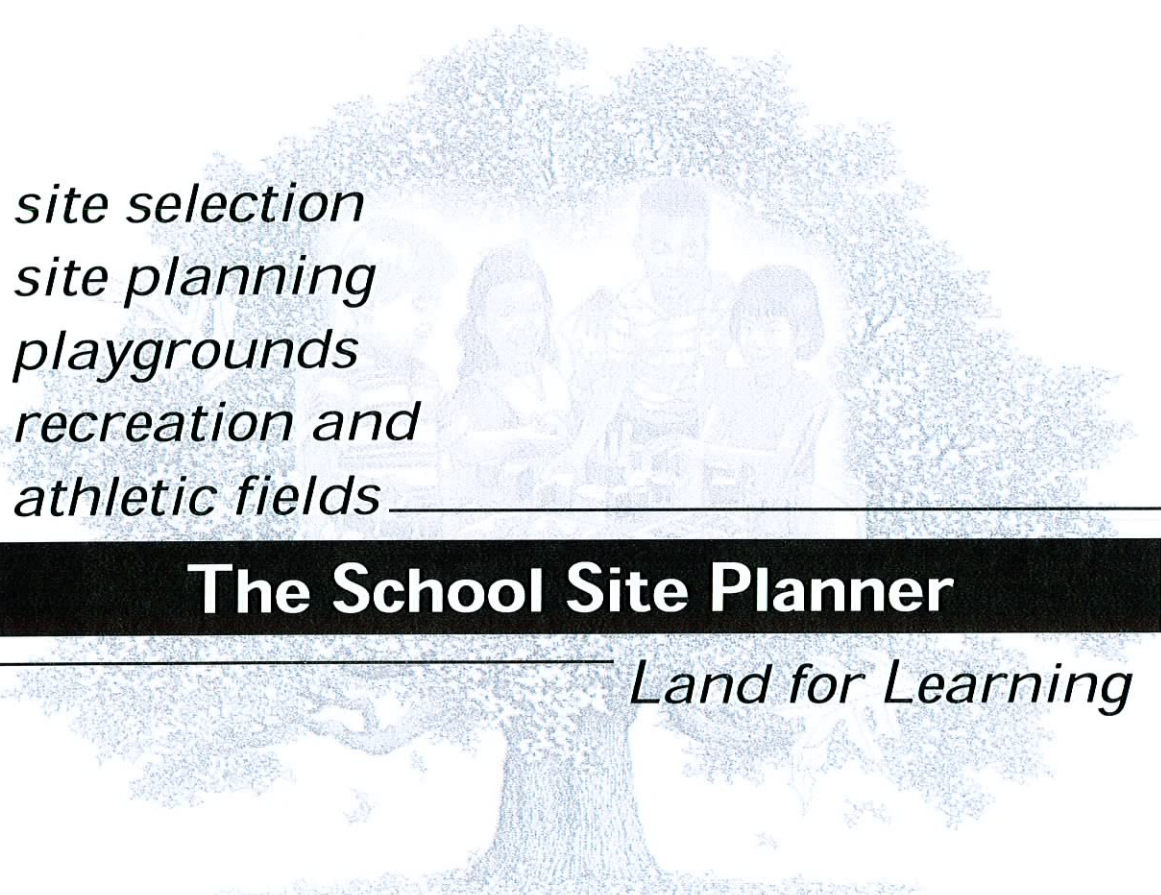
Locate expansion, control, contraction, and isolation joints to comply with recommendations of TCA “Handbook for Ceramic Tile Installation”.

Division 11 – Equipment

See “The School Site Planner”, Section “Planning a Playground” immediately following this section.

Divisions 12 - 14

Sections not used.



site selection
site planning
playgrounds
recreation and
athletic fields

The School Site Planner

Land for Learning

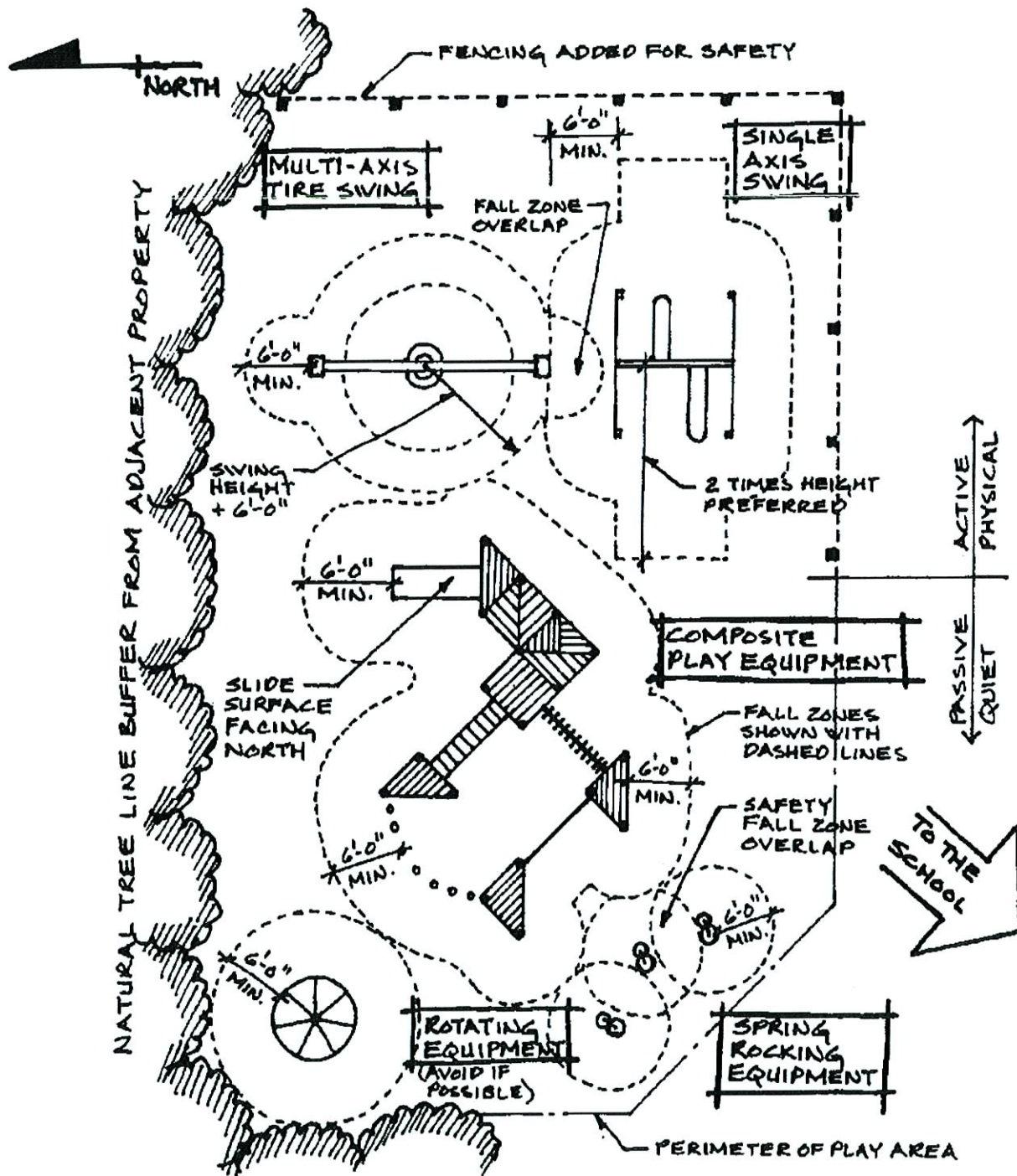
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Public Schools of North Carolina
State Board of Education
Department of Public Instruction

Division of School Support • School Planning
301 N. Wilmington St. Raleigh, NC 27601-2825
<http://www.dpi.state.nc.us/clearinghouse>

Playgrounds



Planning a Playground

School Planning recommends more open playgrounds for group activity games than playgrounds with fixed equipment. Group activities are safer and help teach team playing and good sportsmanship. Playground equipment presents too much liability to the school system, with the increasing number of equipment-related injuries and deaths.

The Consumer Product Safety Commission published the results of a study on playground equipment-related injuries and deaths in April 1990. The study showed that there were approximately 170,200 playground equipment-related injuries treated in U.S. hospital emergency rooms in 1988. Approximately 70 percent of all incidents involved equipment in public locations. Most of the incidents on public equipment occurred in schoolyards and public parks, each accounting for about 40 percent of all injuries. These equipment-related injuries continue to increase each year.

Planning A Playground

The most important thing to remember in planning a playground is the safety of the children. All playground equipment must be well maintained regularly and the playground area kept clean of any broken glass or other dangerous debris.

Locating a Playground On a School Site:

- Consider areas that are free from hazards or obstacles to children traveling to and from the playground.
- Surround the playground with plants or fencing to prevent small children from inadvertently running into a street or leaving the playground unsupervised.
- Locate a fenced-in playground for pre-kindergarten children next to their classroom.
- Locate a fenced-in playground for kindergarten and first graders close to their classroom wing and away from the playground area for older children.
- Keep vehicular traffic away from areas designated for playgrounds.
- Locate playgrounds and athletic fields close to the multi-purpose rooms and gymnasiums.
- Keep playgrounds and athletics fields away from on-site sewage waste disposal systems and nitrification fields.

Important Tips on Locating Playground Equipment:

- Separate active/physical activities from passive/quiet activities.
- Keep clear sight lines over the entire playground for supervision.
- Disperse popular or heavy-use equipment to avoid crowding.
- Locate moving equipment such as swings and merry-go-rounds to a corner or edge.
- Locate exits to slides in non-congested areas.
- Provide separation of equipment by age groups:
Preschool (4 to 5 years old) and School-age (6 to 12 years old)
- Consider upcoming ADA guidelines for accessible playground equipment at:
<http://www.access-board.gov/rules/playfac.htm>

General Hazards Related to Playground Equipment to Avoid:

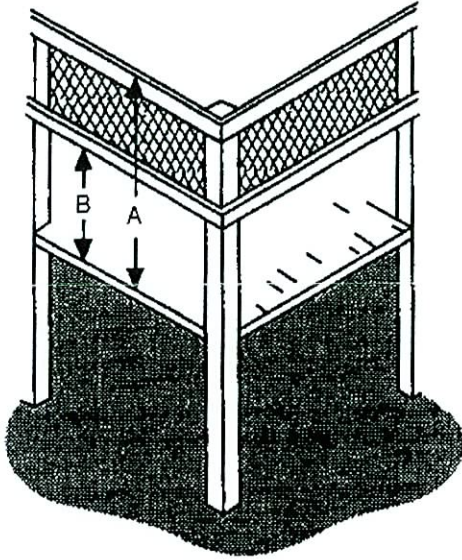
- Avoid sharp points, corners or edges; provide rounded edges with a minimum radius of 1/4 inch.
- All wood should be smooth and free of splinters.
- All wood should be insect-resistant or treated to avoid deterioration. Inorganic arsenical is the most common wood treatment substance. **Do not use** creosote, pentachlorophenol, tributyl tin oxide or pesticide containing finishes because they are too toxic or irritating to the skin.
- All ferrous metals should be painted or galvanized to prevent rust.
- Protrusions or projections should resist entanglement of clothing. Restrict all protrusions and projections to 1/8 inch maximum.
- Avoid accessible pinch, crush or shear points.
- Avoid openings that could trap a child's head or body. An opening may present an entrapment hazard if the distance between any interior opposing surface is greater than 3.5 inches and less than 9 inches.
- Avoid angles of any vertex less than 55 degrees to one leg horizontal.
- Bury all anchoring devices below playing surfaces to eliminate tripping.
- Keep area clean of broken glass or other hazardous debris.
- Retaining walls should be highly visible and elevation changes obvious.
- Avoid cables, wires, ropes or flexible components in high-traffic areas.
- All fasteners, connecting, and covering devices should not loosen or be removable without the use of tools and should have a corrosion-resistant coating.
- All bearings in moving joints should be easy to lubricate or be self-lubricating.
- Avoid bare or painted metal surfaces unless they can be located out of the direct rays of the sun.
- Avoid rung ladders and climbing components as the sole means of access.
- Do not attach a single-axis swing to composite playground structures.
- Fall zones of adjacent pieces of equipment should not overlap.
- Platforms over 6 feet high should provide an intermediate landing.

Four Key Elements of Playground Safety

1. Removing equipment that is too tall.
2. Installing resilient surfacing under all equipment.
3. Removing hazards such as debris or broken equipment.
4. Supervising children's play.

It is up to parents, teachers and individuals in the community to demand safer play areas and to provide proper supervision for children's play.

Ladders and Platforms



- A = 38" minimum for older children
or
29" minimum for younger children
- B = 26" maximum for older children
or
23" maximum for younger children

Design Recommendations for Ladders and Platforms

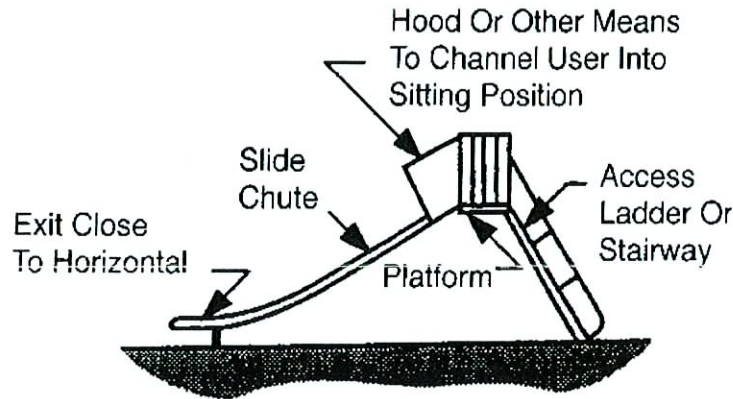
Step/Ladder Design: Provide evenly spaced steps or rungs.
Close in risers that are between 3.5 and 9 inches in height.
Flexible climbing devices, such as net, chain or tire climbers, shall not be the sole means of access to other components of equipment.

Handrail Design: Handrail heights should be between 22 and 38 inches.
Avoid horizontal railings for protective barriers; use vertical railings to minimize the likelihood of climbing.
Continuous handrails shall be provided on both sides of stairs and ladders.

Platform Design: Slope platforms within 2 degrees of the horizontal plane.
Provide openings for drainage on all platforms.

- *Preschool:* Provide a guardrail on platforms ≥ 20 inches in height and a protective barrier on platforms ≥ 30 inches in height. The top surface of guardrails shall be at least 29 inches and the lower edge should be no more than 23 inches above the platform. The maximum height between stepped platforms is 12 inches.
- *School-age:* Provide a guardrail on platforms ≥ 30 inches in height and a protective barrier on platforms ≥ 48 inches in height. The top surface of guardrails shall be at least 38 inches and the lower edge should be no more than 26 inches above the platform. The maximum height between stepped platforms is 18 inches.

Slides



Design Recommendations for Slide Components:

Platform Design: Minimum length of 22 inches.
 Width equal to width of slide.
 Surround platform with guardrails and barriers.
 No gap between the platform and sliding surface.
 Handholds should be provided at the entrance to all slides.
 Add a hood or chute to channel user into a sitting position.

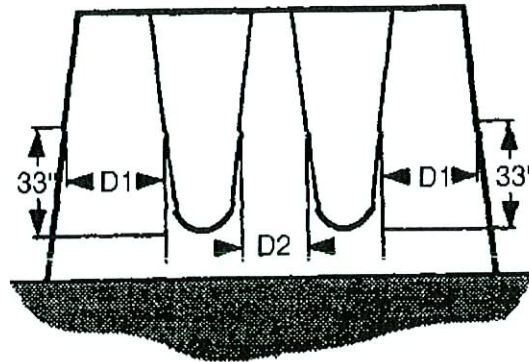
Sliding Surface: Average incline should not exceed 30 degrees.
 Slope changes should not allow a child to lose contact with surfaces.
 Straight slides should have sides 4 inches minimum in height.
 Metal slides should be located in the shade or facing north.
 Tube slides should be no less than 23 inches in diameter.

Exit Regions: Minimum length of 11 inches.
 Slide exit edges should be rounded or curved.
 Essentially horizontal and parallel with the ground with a slope between 0 degrees and -4 degrees to the ground.
 The slide exit radius of curvature shall be 30 inches or greater.
 All slide exits should be located in uncongested areas.
 Allow a 6'-0" minimum fall zone on all sides of the slide.

<i>Slide Height</i>	vs	<i>Exit Region Height</i>
≤ 4'-0"		≤ 11 inches
> 4'-0"		7 inches to 15 inches

Recommended:	Embankment Slides Low Free-standing Slides Spiral Slides Tube Slides	Do Not Use: Roller Slides High Free-standing Slides
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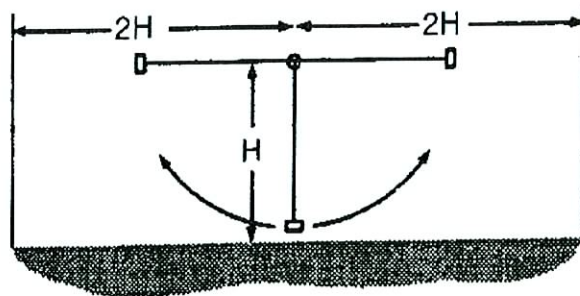
Swings



D1 = Minimum 30"
D2 = Minimum 24"

Design Recommendations for Swing Components

- Swing Structure:**
- Use support hardware that requires a tool for removal.
 - S-hooks should be pinched closed as tightly as possible.
 - A-frame support structures should not have horizontal crossbars.
 - Install only two single-axis swings in each swing structure bay.
 - Install only one multi-axis tire swing in each swing structure bay.
 - Do not attach single or multi-axis swings to composite structures.
 - Install swing hangers wider apart than the swing seat.
 - Use 30-inch minimum clearance between seat and swing structure.
 - Use 24-inch minimum clearance between adjacent swing seats.
 - Allow a fall zone of twice the swing height in the front and back.

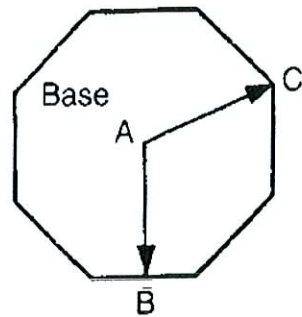


- Seat Design:**
- Swing seats should hold no more than one child.
 - Plastic seats are recommended; do not use wood or metal.
 - Seats should have a smooth finish and rounded edges.

Recommended: Tot Swings
Multi-axis Tire Swings

Do Not Use: Multiple Occupancy Swings
Rope Swings
Animal Figure Swings
Swinging Exercise Rings
Trapeze Bars
Large Single-Axis Swings

Merry-Go-Rounds

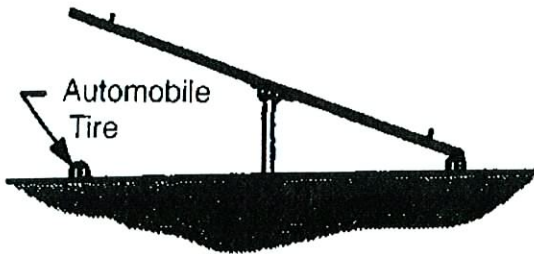


A = Axis of Rotation
 AB = Minimum Radius
 AC = Maximum Radius

Design Recommendations for Merry-Go-Rounds

Platform Design: The rotating platform should be continuous and almost circular. No component or handrail should extend past the outer perimeter. The platform should have no sharp edges. Openings in the platform should not be over 5/16 inch in diameter. Maximize peripheral speed of rotation to 13 ft/sec. if possible. Do not include an oscillatory (up and down) motion. The difference between platform radii should not exceed 2'-0".

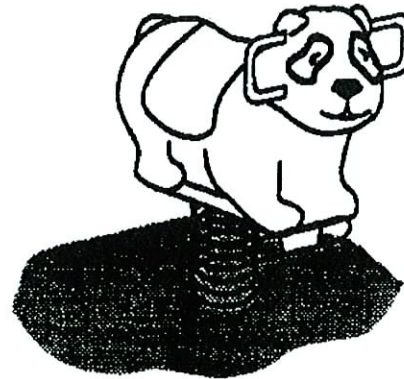
Do Not Use: Merry-go-rounds in preschool playgrounds.
 * Merry-go-rounds are not recommended by School Planning.



Fulcrum Seesaw

Seesaws should be securely anchored to a central fulcrum and mounted over shock-absorbing material imbedded in the ground below the seats to minimize impact with the ground. The maximum attainable angle to the horizontal is 25-degrees and the maximum attainable seat height is 5 feet.

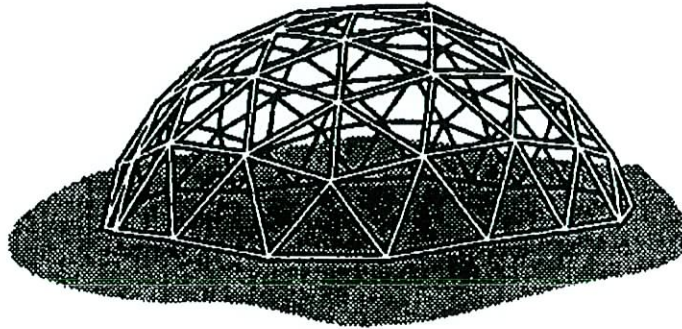
* Seesaws are not recommended by school planning.



Spring Rocking Equipment

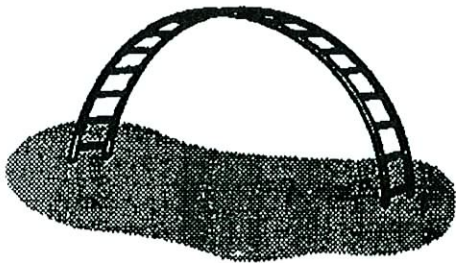
The springs of rocking equipment should minimize the possibility of children pinching either their hands or feet between coils or between the spring and a part of the rocker. Each seat should have handgrips and footrests. The height of the seat while at rest shall not be less than 14 inches and not more than 28 inches above the ground.

Climbing Equipment



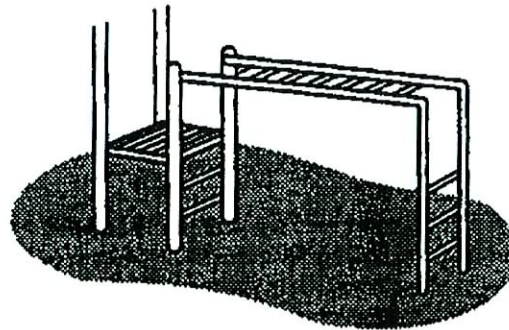
Design Recommendations For Climbing Equipment

- General Safety:** Climbers should not have any other structural component in the interior or below the structure to be climbed.
- Climbing equipment should allow children to descend as easily as they ascend.
- Climbing equipment for Pre-K children should offer an easy out.
- Flexible-grid climbing devices providing access to platforms should be securely anchored at both ends.
- Rung ladders and climbing components should not be used as the sole means of access.



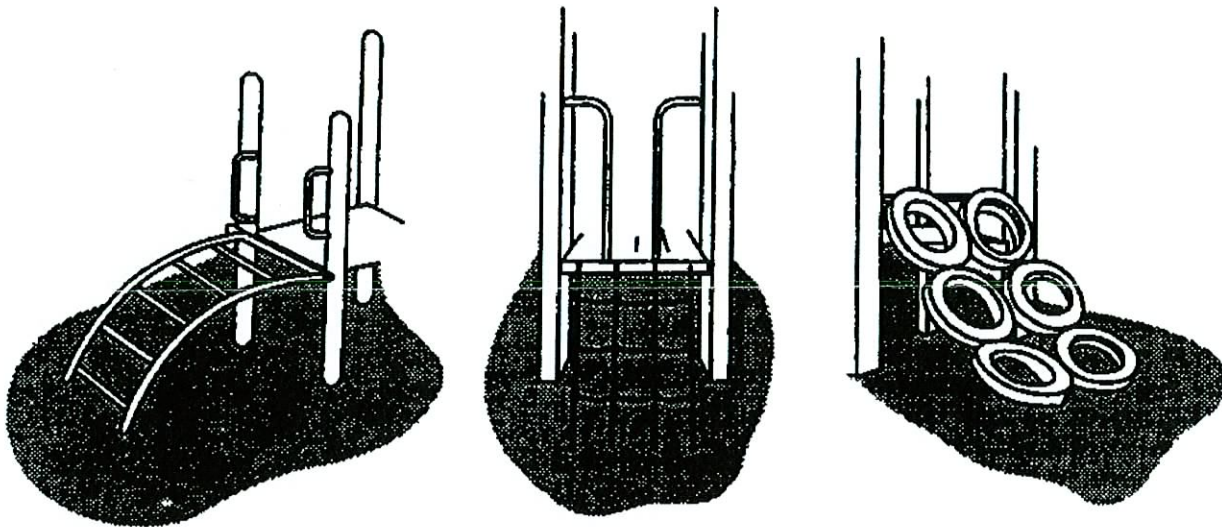
Arch Climbers

These climbers may be free-standing or provided as a more challenging means of access to other equipment. However, they should not be used as the sole means of access. The slope should be between 75 - 90 degrees, vertical rise (tread to tread) should be less than or equal to 12", and the rung width should be greater than or equal to 16", with a 1" to 1.67" diameter.



Horizontal Ladders & Overhead Rings

The space between adjacent rungs should be greater than 9" and the center-to-center spacing of horizontal rungs should not exceed 15" (overhead rings should include the arc of the swinging motion). The first handhold on either end should not be placed directly above the platform or climbing rung used for mount or dismount.



Combining Climbing Equipment With Composite Structure Platforms

Climbing equipment is designed to present a greater degree of physical challenge than other playground equipment. Physical skills necessary for certain climbing activities are balance, coordination, and upper body strength. Climbers include a wide variety of equipment, such as: arch climbers, sliding poles, chain or net climbers, overhead horizontal ladders, overhead rings, dome climbers, parallel bars, balance beams, cable walks, suspension bridges, and spiral climbers. These climbing devices can also be linked to platforms on composite structures. Older children tend to use climbing equipment more frequently and proficiently than younger children.

Balance Beams: To avoid groin injuries during falls, balance beams should be no higher than 12" off the ground.

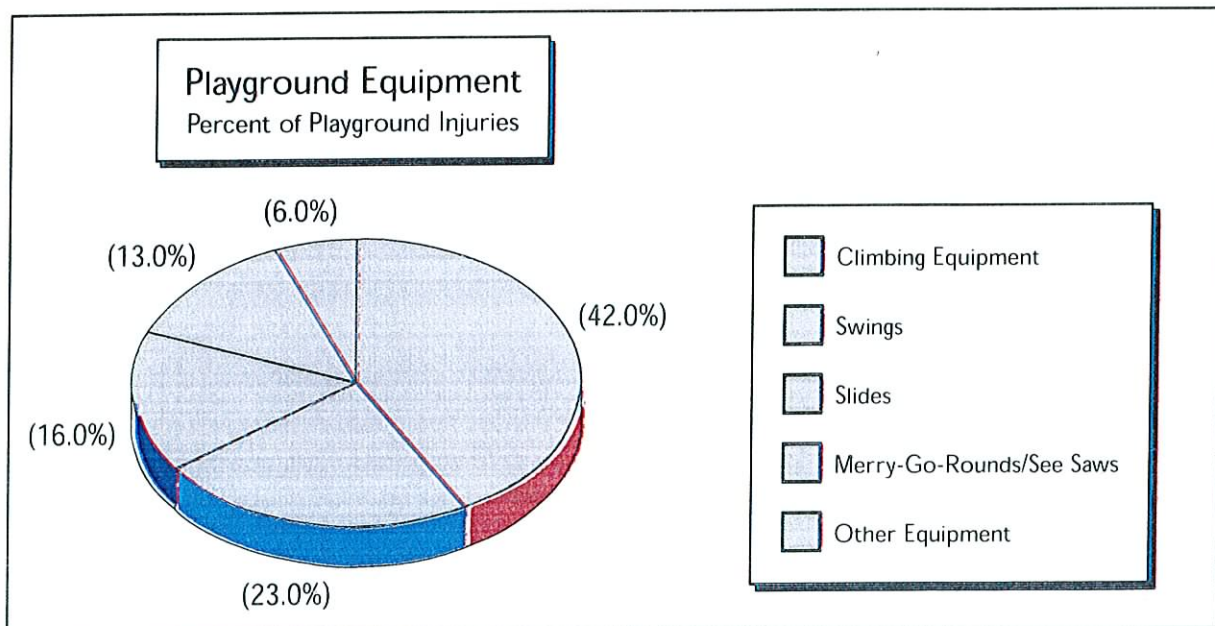
Climbing Ropes: Recommended only if the ropes are securely anchored to a footing at the lower end to prevent the rope from being looped back on itself and forming a noose.

Sliding Poles: Vertical sliding poles require upper body strength and coordination. Poles should be continuous, with no protruding welds or seams. Poles should be straight, with no change in direction. Horizontal distance between a sliding pole and the edge of the access platform should be at least 18", but not more than 20". The sliding pole should extend at least 38" above the level of the access platform. The diameter of the sliding pole should be no greater than 1.9".

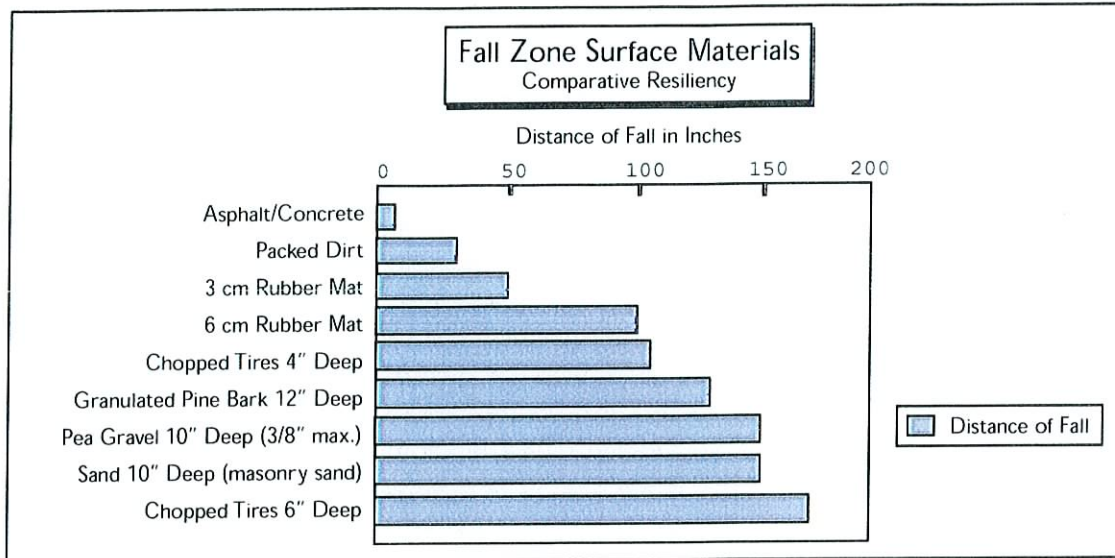
Protective Fall Zone Dimensions

All playground equipment should have a protective fall zone surrounding it for unexpected falls. This area should be kept separate from pedestrian walkways and fall zones for adjacent play equipment. The recommended minimum dimensions are:

- Stationary Equipment:** Extend fall zone 6'-0" minimum in all directions.
- Slides:** Extend fall zone 6'-0" minimum on each side and the ladder access side. The slide exit should have a minimum of 6'-0" from the end of the slide or a distance of the slide height from ground to platform plus 4'-0", whichever is greater.
- Single Axis Swing
or
Multi-Axis Tire Swing:** Extend fall zone in front and back a minimum distance of 6'-0" plus the length of the suspending members. The sides should have a 6'-0" fall zone that can overlap with another swing structure.
- Rotating Equipment:** Extend fall zone a minimum of 6'-0" from perimeter.
- Spring Rocking Equip:** Extend fall zone a minimum of 6'-0" from the "at rest" perimeter. Adjacent spring rockers can share fall zones if the maximum seat height is 24 inches.
- Composite Equipment:** The fall zone shall be composed of the fall zones stated above for individual pieces of play equipment.



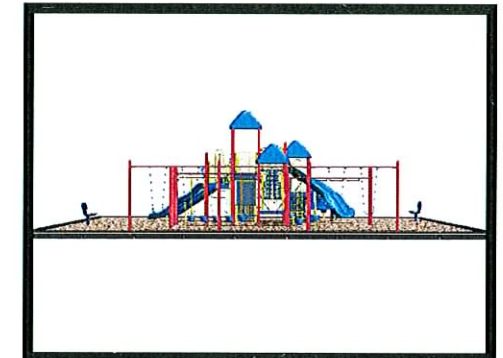
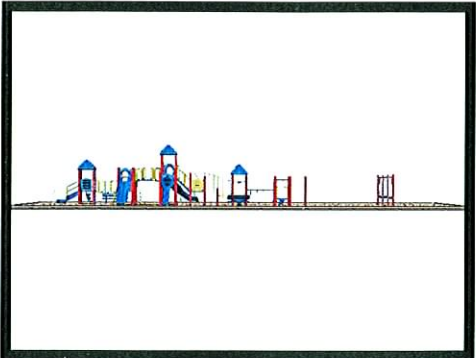
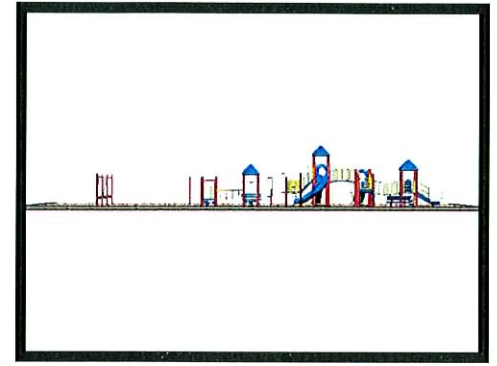
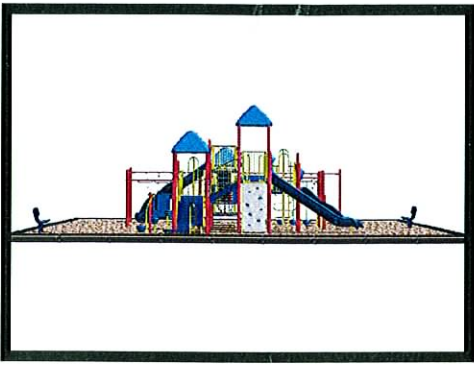
Fall Zone Surface Materials



Three Types of Surface Materials for Under and Around Playground Equipment:

1. Unitary synthetic materials, such as rubber mats, foam mats, etc.
2. Organic loose-fill materials, such as wood chips, bark mulch, etc.
3. Inorganic loose-fill material, such as sand and gravel.

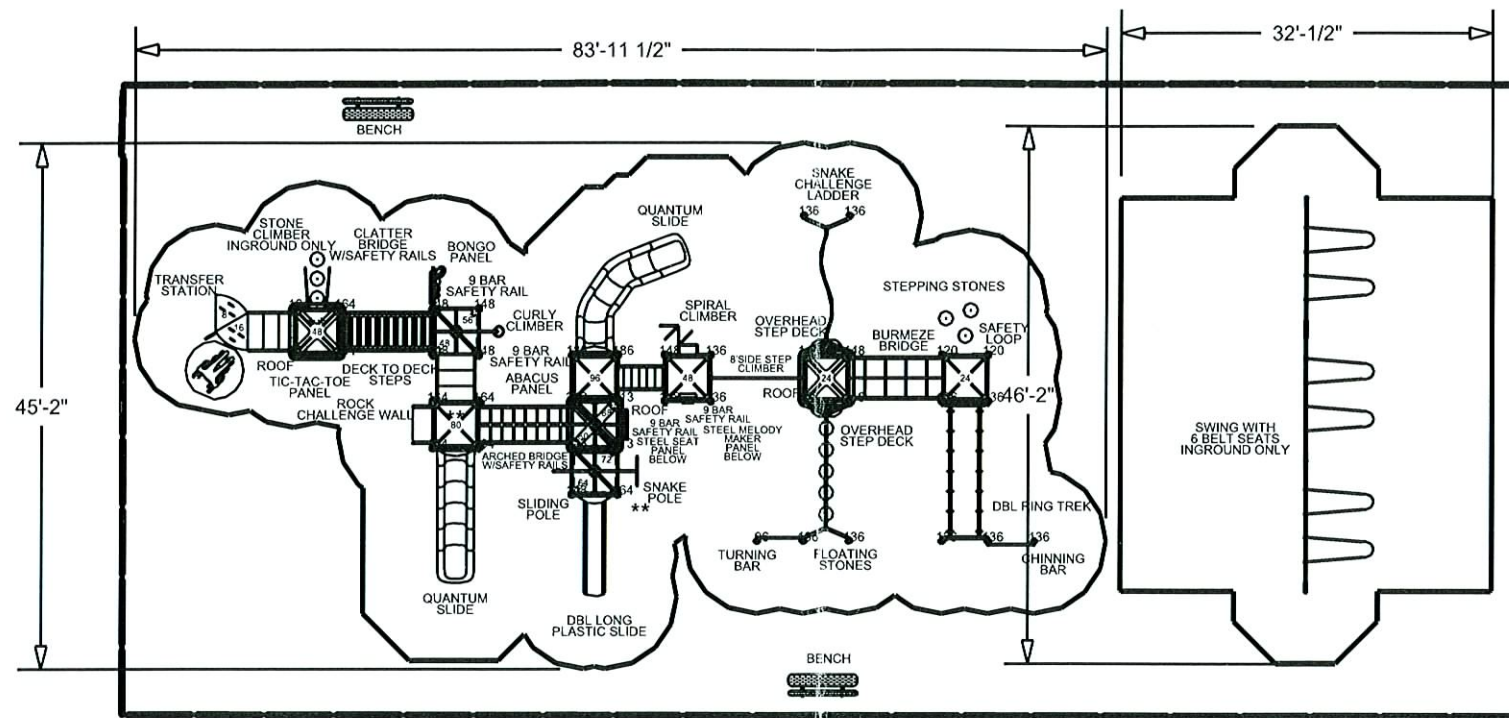
	Unitary Synthetic Materials	Organic Loose-fill Materials	Inorganic Loose Material
Installation/ Maintenance	Can be laid directly on hard surfaces when other materials may require undersurface preparation and installation. Requires no containment. Requires min. maintenance.	Do not install over hard surfaces. Requires containment. Requires good drainage. Requires periodic renewal or replacement and maintenance	Do not install over hard surfaces. Requires drainage, containment and replacement. Sand needs loosening. Gravel needs breaking up.
Advantages	Low maintenance. Easy to clean. Consistent shock absorbency. Material does not displace. Low life cycle costs. Good footing material. Harbor few foreign objects. No retaining edges needed. Accessible to the physically disabled.	Low initial cost. Ease of installation. Good drainage. Less abrasive than sand. Less attractive to cats and dogs compared to sand. Attractive appearance. Readily available.	Low initial cost. Ease of installation. Does not pulverize. Not ideal for microbial growth Nonflammable. Materials are readily available. Not susceptible to vandalism. Gravel is less attractive to animals than sand.
Disadvantages	Initial cost relatively high. Undersurfacing required for thin materials. Needs level uniform surface. May be flammable. Subject to vandalism. Rubber tiles may curl up and cause tripping. May be susceptible to frost damage.	Decomposes over time. Can be blown or thrown. Subject to microbial growth. Conceals animal excrement and trash. Spreads easily outside containment area. Can be flammable. Subject to theft by neighborhood residents for mulch.	May be blown or thrown. May be swallowed. Conceals animal excrement and trash. Spreads easily outside containment area. Sand adheres to clothing. Gravel is difficult to walk on. Gravel could cause hazards if displaced in other areas.



NOTES

Scale*: 1/16"=1'

- 1.The Americans with Disabilities Act (ADA) may require that you make your park and/or playground accessible when viewed in its entirety. Please consult your legal counsel to determine if the ADA applies to you.
 - 2.For playground equipment to be considered accessible, accessible surfacing must be utilized in applicable areas.
 - 3.Although a particular playground design may not meet the proposed Access Board Regulations in regards to the appropriate number of ground level events, the actual playground may be in compliance when considering existing play components.
 - 4.All deck heights are measured from top of ground cover.
 - 5.Fall absorbing ground cover is required under and around all play equipment.
 - 6.The minimum recommended fall zone around the entire playstructure is shown. This zone is to be free of all tripping or collision hazards (i.e. roots, rocks, border material, etc.).
 - 7.Age appropriate label locations are marked with a double asterisk ** you make your park and/or playground accessible when viewed in its entirety. Please consult your legal counsel to determine if the ADA applies to you.
 - 8.All post lengths are identified by text showing the post lengths, i.e. 96 represents a 96 inch post.
- * Scale for reference only. Use dimensions as shown.



Minimum recommended fallzone
 Area: 2601 sq. feet
 Perimeter: 254 feet

Minimum recommended fallzone
 Area: 1209 sq. feet
 Perimeter: 148 feet



FIRE SUPPRESSION AND PLUMBING DESIGN GUIDELINES

Facility Services: Divisions 21-22

Division 21 – Fire Suppression

Designers are encouraged to use unit pricing for smoke heads, sprinkler heads and other items that could be added during the final phases of a project by Authorities Having Jurisdiction

Division 22 - Plumbing

GENERAL PLUMBING REQUIREMENTS

The design consultant shall design for CCS during the design process the plumbing waste and water connections to a manhole near the location of future portable classrooms (mobile/modular location as recommended by the design team).

All water piping shall be located a minimum of 10 ft. from electrical switchboards and panel boards.

Do not locate pumps, motors, or other equipment requiring routine maintenance overhead.

All water storage tanks shall be glass or cement lined. Any water storage tank over 200 gallons shall have a man-way for maintenance access.

Provide hose bibs every 100 feet on mezzanines for maintenance procedures.

Provide hose bibs in restroom floor drain.

ENERGY CONSERVATION - See Section 01 81 13, "Sustainable Design Guidelines".

Specify that all warranties shall commence from the date of Substantial Completion, not from the start-up date of the equipment.

Ten year warranty.

One complete hard copy set and one CD set of operation and maintenance manuals shall be delivered to the owner through the A/E two (2) weeks before the pre-final inspection is held.

Camera all drain lines and submit video to owner.

PLUMBING SYSTEM

All provisions of the General Plumbing Requirements apply to this section.

All water consuming devices shall be the water saving type.

Provide positive freeze protection on all water lines subject to freezing conditions.

Provide a ball valve in branch piping to all exterior hose bibbs. Where suitable, locate hose bibbs adjacent to exterior mechanical rooms, dropping branch piping exposed in mechanical room and locating ball valve a maximum of 3 ft. above finish floor.

All ball valves must be accessible above ceiling.

Contractor shall be required to completely rod and flush out all sanitary waste lines both new and existing after a building is completed.

Provide chrome escutcheon rings at all exposed ceiling and wall penetrations.

Provide isolation ball valves in cold water and hot water piping so that water can be shut off to each classroom wing, administration area, group toilets and science classrooms. Provide label on ceiling grid to identify valve location.

Slope floor to floor drain.

PLUMBING SUPPORTS AND ANCHORS

Use one hanger manufacturer throughout job.

Horizontal piping hangers - insulated piping shall have hanger around insulation with rigid insulation above shield. Use adjustable steel clevis hangers. Insulation shall be continuous through pipe supports.

Vertical piping clamps - size to fit over piping insulation.

Building attachments - use beam clamp with retaining strap or concrete inserts.

Do not support piping from bar joist bridging and/or roof deck.

Support all piping so as to prevent excessive movement.

PLUMBING INSULATION

Insulate all domestic water piping with 1 in. thick minimum insulation. Refer to energy code for additional requirements.

Tape down main seam: 1 inch taped around pipe every 2 feet and stapled.

Insulate any supply grills and canvas connections.

Insulate roof leader horizontal piping with 1 in. thick minimum insulation to include roof drain pan and vertical piping from roof drain.

Install 20 gauge smooth aluminum or PVC jackets on all exposed insulated lines within 8 ft. above floor in occupied spaces.

Provide sheet metal saddle at all pipe hangers with rigid insulation.

Provide rigid insulation at pipe hangers for all insulated piping 2 in. and larger.

POTABLE WATER & FIRE WATER SYSTEMS

Well (6 in. minimum) will be located and bored by Contractor, in a timely manner, after consultation with Designer.

Site contractor shall provide submersible pump, hydropneumatic storage tank, chlorinator & filters. The proper filters shall be used to stop sedimentation.

Pump house by general contractor.

Designer shall research all applicable fees and recommend who pays for what, based upon local jurisdiction.

Fire loop around building shall be 8 in. minimum with fire hydrants spaced no greater than 300 ft. and no parts of the building more than 300 ft. from a hydrant. Provide second water only meter for irrigation, cooling tower, and other non-sewer services. This will be on separate water line from main building service.

Provide backflow preventers per local jurisdiction.

Fire hydrants and valves shall be approved by local inspectors. Locate meter at property line and/or right of way line in non-traffic area.

Minimum 18 in. cover to top of pipe for 2-1/2 in. and smaller.

Minimum 48 in. cover to top of pipe for 3 in. and larger.

Backflow preventer for fire loop or irrigation shall be located above ground. Engineer shall require contractor to dimension actual location of all underground water lines on as-built drawings. A minimum of two (2) dimensions from building reference points shall be provided and a bury depth indicated.

DRAINAGE AND VENT SYSTEMS

Includes sanitary, acid and storm drainage and vent piping systems inside building to a point 5 ft. outside building.

Roof drains are to be furnished and located by the Plumbing Contractor. General Contractor shall install roof drains. Plumbing Contractor shall connect to roof drain outlet.

Install underground drainage mains with the laser beam alignment system.

Install all vents through roofs a minimum of 30 ft. from fresh air intake.

Depress floor drains below room perimeter minimum of 1/2 in.

Route waste piping from science classrooms to acid dilution tank and tie into sanitary sewer.

Acid waste piping should be utilized upstream of dilution trap/tank. PVC/standard waste & vent piping should be utilized downstream of dilution trap/sink.

SEWAGE DISPOSAL

Provide profiles of sanitary sewer lines between manholes.
Provide manhole to make tie-in to 6 in. and larger sewer.

Manholes shall be spaced no more than 300 ft.

Minimum cover in non-traffic areas shall be 3 ft.

Minimum cover in traffic area - 5 ft. for PVC, 3 ft. for ductile iron on Class I bedding.

Use laser instrument to install all exterior sanitary sewer lines.

Minimum slope of sewer lines per local standard.

Minimum flow velocity - 2 FPS

Sewer lines shall be straight with uniform slope between manholes.

Maximum slope is 10%.

Install metal identification tapes over PVC sewer lines.

Engineer shall require contractor to dimension actual location of all sewer lines on as-built drawings. A minimum of two (2) dimensions from building reference points shall be provided and a bury depth indicated at a maximum spacing of 100 ft.

All work shall comply with local requirements.

If lift station is required, electrical contractor shall provide a generator supplied auxiliary source of power. A phone service shall be provided to allow communication between the station and any outside monitoring company.

PLUMBING FIXTURES

All fixtures used by students - including handle, screws, aerators and showerheads shall be vandal proof.

All cast iron and vitreous china fixtures shall be white.

Stainless steel sinks shall be 18 gauge.

All gang toilet lavatories shall have chrome plated rigid supplies with angle I.P.S. loose key stops.

All lavatories shall have chrome plated cast brass p-trap and wall nipple.

All sinks and water coolers shall have chrome plated semi-cast 17 gage brass p-traps.

All fixtures shall have separate stops unless integral stops are used.

All flush valves shall have solid ring supports.

All art room sinks shall have plaster p-trap.

Mechanical rooms shall have primer valves and/or deep seal p-traps for floor drains, with primer valve located inside mechanical room.

Emergency eye wash stations (in new construction only) shall have floor drain with trap primer.

Use gas water heaters for kitchens and gym areas. Use small tank type electric water heaters for remote uses. Do not use instantaneous water heaters.

Locate temperature gages above all water heaters.

Group toilets shall have key operated chrome plated box type hose bibb flush with wall.

Key operated box type automatic draining non-freeze wall hydrants shall be around exterior of building every 100 feet. Provide ball valve in branch piping for isolation purposes.

A washer box shall be provided for all residential type washing machines with cold water, hot water and drain.

Student group showers shall have tempered water with single handle control.

All lavatories served by both hot and cold water shall be cast-iron wall hung lavatories with 4 in. centers, 20 in. x 18 in. grid drain.

All administrative toilets shall have single lever center set lavatory fittings.

Branch piping to custodial closets shall have check valves in cold and hot water piping.

Lavatories at group toilet rooms shall have metered faucets (laser only). Ease of operation is a must for small children (no push buttons).

Classrooms and workrooms shall have single bowl sinks. Teacher's lounge and Exceptional Children areas shall have double bowl sinks.

Pre-cast mop receptor shall have stainless steel wall protector.

Water closets shall have elongated bowls.

Water closet seats shall be institutional grade.

Drinking fountains shall be wall-mounted, enameled cast iron. All electric water coolers (K-12) shall be wall mounted wheel chair type, with electric push button on front; colored vinyl covered steel skirt and flexible safety bubbler spout.

Expansion tanks for all water heaters shall be ASME certified.

Specify Carriers for all wall hung fixtures including urinals and lavatories.

A walk-in plumbing chase shall be allowed at group toilets.

All lavatories shall have both cold and hot water.

Specify flush valve for all water closets. Coordinate water closet flush valve height with grab bars.

Place water coolers in hallways and all common areas.

Handicapped heights shall comply with most current NC Building Code and all ADA requirements.

Top of shower controls not more than 48 in.

KITCHEN PLUMBING

Use 2 in. round recessed strainer floor drain for indirect waste from ice machine, and cooler/freezer.

Trough:

1. Use stainless steel floor troughs for wastes from tilting skillet and area in front of steamer.
2. Use stainless steel strainers built-in as a component of trough.
3. Trough to be located far enough in front of tilting skillet to allow water to pour directly into trough. (Install parallel to hood, the length of the hood.)

Use hand sinks with wrist blade handles and single mix faucets.

Use cleaning faucet and mount under hand sink 12 in. above finish floor.

Use sloped floor drain under cleaning faucet.

Add adequate quantity of general area of sloped floor drains to kitchen so entire floor can be hosed down.

Kitchen equipment shall utilize natural gas where available. Do not use LP gas.

Hood manufacturer shall furnish solenoid gas shut off valve to Mechanical Contractor for installation.

Supply 140 deg. F. to prep and pot sinks, can wash and mop receptor.

Circulate hot water for 140 deg. F. and 110 deg. F. loops.

Use non-clog floor drain for can wash.

Use manual hose reel in kitchen area for wash down.

Use fill hot and cold water faucet with sprayer hose for tilting skillet.

Kitchen plumbing to be cast iron.

Use copper pipe for prep and pot sink continuous waste.

Use backflow preventer for cold water and hot water Kitchen supply.

Use shock absorbers for all solenoid operated equipment.

All final connections to kitchen equipment shall be done by Plumbing Contractor.

Kitchen equipment contractor shall furnish and install faucets for prep and pot sinks.

Kitchen equipment contractor shall furnish to Plumbing Contractor for installation in water piping items such as solenoid valves, thermometers, etc.

Provide water filter at kitchen icemaker connection and steamer.

Hand sinks shall be located within 20 feet of all preparation and service areas.

Kitchen shall have dedicated hot water supply.



HEATING, VENTILATING AND AIR CONDITIONING DESIGN GUIDELINES

Facility Services: Division 23

Division 23 – Heating, Ventilating and Air Conditioning

GENERAL MECHANICAL REQUIREMENTS

The selection of all HVAC systems and other systems shall be approved by the responsible CCS authority at the schematic phase of design.

Refer to Division Section 01 81 13 “Sustainable Design Guidelines” for requirements as defined in *The Advanced Energy Design Guide for K-12 School Buildings, Achieving 30% Energy Savings Toward a Net Zero Energy Building*, published in 2008 by The American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc., in association with the American Institute of Designers; the Illuminating Engineering Society of North America; the U.S. Green Building Council; and The U.S. Department of Energy.

Air side economizer cycles shall be used where possible, for the energy savings and the effect on health through the reduction of airborne bacteria count.

Low-leakage type outdoor air dampers shall be used to minimize air infiltration during off hours. Max. leakage of 1/2 of 1% at pressure differentials under 4 in. Dampers are mechanical spring.

Electric heaters shall be used in all exterior mechanical rooms, which have hydronic piping.

TYPES OF HVAC SYSTEMS:

Note: All designers shall be required to meet with the responsible CCS authority prior to the Schematic Design Submittal to discuss and approve the zoning for each project. The designers shall have the option to present to CCS other types of HVAC systems for approval, prior to design.

Listed below, in order of system preference, are the approved systems for school buildings:

1. Four (4) pipe variable speed pumping systems with air cooled chiller(s) condensing boiler(s). Central station air handling units with variable speed drive and variable air volume (VAV) boxes with hot water reheat coils.
2. Four (4) pipe constant speed pumping systems with air cooled chiller(s) and condensing boiler(s). Central station air handling units with variable speed drive and variable air volume (VAV) boxes with hot water reheat coils.
3. Four (4) pipe variable speed pumping systems with air cooled chiller(s) and condensing boiler(s). Constant volume central station air handling

units with zoning based on similar spaces with like exposure. Ventilation air will require a dedicated pre-treatment system to address humidity concerns.

4. Four (4) pipe constant speed pumping systems with air cooled chiller(s) and condensing boiler(s). Constant volume central station air handling units with zoning based on similar spaces with like exposure. Ventilation air will require a dedicated pre-treatment system to address humidity concerns.
5. Heat pump system.
6. Geothermal heat pumps.

Packaged air-cooled chillers are preferred.

Chillers shall be furnished with louvers to protect the condenser sections and wire guards to protect the compressor sections.

Rooftop units are not preferred, but may be utilized at the written approval of the owner only. If approved, use spring type isolation curbs & install gypsum board inside curb for noise reduction. (Example: Mason Industries, Inc. RSC-JB with Acoustical package)

Designate areas as 10 and 12 month for zoning purposes.

1. 12-month areas shall be served by separate HVAC Systems, not requiring central plant operation unless their combined loads indicate efficient and economical operating of central plant during normally unoccupied periods.
2. Administrative Areas, Media Centers, Kitchens and Gyms are normally 12-month areas.

Designers need to adequately size cooling systems to serve gyms and computer labs.

FUEL SOURCES

Cooling: Electricity shall be used for all cooling equipment and heat pumps.

Heating:

1. Natural gas shall be used in all cases where available.
2. LP gas shall be used when natural gas is not available.

DESIGN CONDITIONS AND ENERGY USAGE

Energy Management System

1. Manufacturer: Trane Tracer Summit.
2. Ability of override set points, valves and turn on motor.
3. Battery backup.
4. Supply with reinstall programs for control boards.

SUMMER DESIGN CONDITIONS

1. Indoor: 75degrees F, 50% RH
2. Outdoor: 92 degrees F dB, 75oFWB
3. Load Calculation Safety Factor = 0%

WINTER DESIGN CONDITIONS

1. Indoor: 72degrees F
2. Outdoor: 10 degrees F
3. Load Calculation Safety Factor = 10%
4. Engineer shall design the HVAC system so as to provide building relative humidity levels less than 60% at all times.

Provide a copy of all load and energy calculations to CCS at the Design Development submittal.

For new buildings, provide estimates of monthly energy use in BTU per SF and cost per SF by fuel type, using current unit fuel cost, at the design development and working drawing phases of the design to the CCS Facilities and Operations Department.

VENTILATION

Each building or portion thereof shall be provided with the capability to provide ventilation in accordance with ASHRAE 62, based on building classification and occupant load. A carbon dioxide sensor shall be used to maintain building ventilation in accordance with ASHRAE 62, conserving energy when possible.

Fresh air intakes shall be located a minimum of 30 ft. away from sanitary sewer vent outlets, exhaust outlets and truck and bus loading areas.

Thermostatically controlled ventilation should be provided in main electrical room to prevent excessively high temperatures.

All spaces, which produce dust (cabinetry labs, etc.), shall be negatively pressurized to assist in reducing the infiltration of dust to adjacent spaces. Also, the mechanical systems for these spaces should have easily replaceable filtration systems. In addition, for those spaces programmed to have a dust collection system, the controls shall be designed to halt air conditioning when the dust collection system is engaged.

Work areas for internal combustion engines shall have provisions so that exhaust gases can be exhausted directly to the outside by a carbon monoxide exhaust system.

The storage of flammable or combustible liquids shall be in UL-labeled cabinets with mechanical ventilation, or in storage rooms designed for the purpose. If a flammable or chemical storage room is needed, the engineer and the Designer shall investigate thoroughly with respect to codes and standards.

A separate exhaust fan shall be provided for each chemistry or physics science laboratory and be of such capacity as to be able to quickly remove objectionable odors. Specify number of air changes on drawings. A fan is also desirable in a biology lab, but not needed as critically as in the former two areas; a fan would not be needed in a separate physics lab. Laboratory exhaust fans to be controlled using a wall mounted twist timer. A roof mounted exhaust fan and fresh air intake louver with spring type damper shall be provided at all KILN locations.

Provide a thermostat with twist timer mounted in the kiln room to turn on the kiln room exhaust fan and open the fresh air intake damper upon a rise in room temperature. In addition to this, provide a 4 in. dia. metal dryer vent to exterior.

A separate HVAC System shall be provided for all gymnasium locker/dressing rooms. The system should provide outside air during occupied hours. Use exhaust fans to remove make-up air. Air shall be re-circulated during unoccupied hours. Room temperature shall be controlled by the room sensor. The system shall be controlled by the BAS.

Mechanical ventilation shall be provided for all toilet rooms, janitor's closets, locker rooms, masonry rooms, and storage rooms where odors could become a problem. Ventilation rates to be in compliance with the International Mechanical Code. Ventilation rates listed in the International Mechanical Code to be interpreted as a minimum standard.

Provision shall be made to prevent sound transmission through any common duct system serving more than one area, such as between adjoining classrooms and toilet rooms.

KITCHEN VENTILATION

Automatic fire-extinguishing systems shall be installed in all hoods. Ansul is an acceptable system. Upon activation of the extinguishing system, all fuel shall be shut off, whether gas or electric, and will include fuel to all equipment under the hood, including fryers, broilers, griddles, and ranges. Make-up air shall be shut off, but exhaust fans shall continue exhausting. The fire-extinguishing system shall be designed in accordance with NFPA 96 and NFPA 17. Connect into the Central Fire Alarm System. Locate a manual pull station at nearest exit.

Range hood roof exhaust fans shall be exhausted to the outside and designed to prevent air from being discharged down toward the roof.

All kitchen hoods shall have outside make up air. Pre-condition make up air.

The mechanical contractor shall provide a utility distribution chase to serve the equipment located under the kitchen hood. Utility distribution chase to be provided by the same manufacturer as the kitchen hood.

Exterior entrances to kitchens shall be equipped with a fly fan with automatic switch geared to opening and closing of door. Low voltage door switches are preferred.

MISCELLANEOUS HVAC ITEMS:

Install one-shot chemical feed system in all closed loop water systems.

Electric unit heaters with built-in thermostats shall be installed in all exterior mechanical rooms in lieu of hot water unit heaters. Provide separate disconnect switch.

Provide dehumidification control in all media centers.

All chilled water coils shall be selected based on a chilled water temperature of 2 degrees F higher than that leaving the chiller. Show all selection data in a coil schedule on drawings.

Install sound attenuators in supply and return units wherever possible.

Specify that all refrigeration compressors have 5 - 10 year material warranties.

Locate all cooler and freezer condensers outside building on reinforced concrete pad on ground, protected and for maximum ventilation. (Condensers shall not be located on roof.) Equipment shall be secured to the concrete slab.

There shall be no open-flame heaters, open-coil electric heaters, or spark-producing electric components in areas likely to be used for spray painting or where there will be open containers of gasoline or other explosive vapors or dust.

Boilers and pressure vessels shall be ASME-labeled and installed in accordance with the American Society of Mechanical Engineers "ASME Boiler and Pressure Vessel Code."

Each hot water boiler shall have a low-water cutoff and each steam boiler shall have an extra-low-water cutoff. Low-water cutoff should be manually reset type.

Combustion controls shall meet the requirements of improved Risk Mutual Insurance Corporation, IRM Spec. 205.

Equipment shall be ASME Code-stamped, AGA-labeled, or UL-labeled as and when applicable.

Hot water relief valves, refrigerant relief devices, and steam pop-off safety valves must be piped to location to minimize danger to personnel or students upon relief. Hot water relief valves should be piped to exterior or to funnel-type floor drains located near the equipment.

Air filters shall have a minimum efficiency of MERV 8. The Mechanical Contractor shall be responsible for a complete change of filters at final completion and leaving an additional set of filters at the school for the next change. Filter access must be readily accessible and require no tools to change.

All major items of mechanical equipment that employ any solid-state electronic components shall be fully protected from electrical surges and lightning.

For all hydronic heating/cooling systems, provide manual shut off valves at point where main supply and return lines leave the central mechanical room, where piping leaves and/or enters a building and in mains such that classroom wings can be isolated.

Use of pneumatic controls is not acceptable.

Do not locate AHU's in same room as gas fired boilers or gas fired water heaters.

The use of outdoor boilers shall be prohibited.

Provide full flow by-pass piping at all hydronic coils, AHUs, terminal units, fan coil units, etc. This by-pass piping should be provided with the necessary valving to allow for cleaning and flushing of hydronic piping systems prior to putting water into coils.

Install variable frequency drives with power cleaner.

DESIGN REQUIREMENTS FOR HVAC SYSTEMS

In any building where future expansion is definitely planned, as conveyed by the CCS, the Engineer shall provide adequate additional capacity and connection points in the Mechanical Systems as directed by the CCS. The additional capacity shall be clearly noted on the front sheet of the drawings.

Do not locate pumps, motors, or other equipment requiring routine maintenance overhead.

Thermostats:

1. Adjustable setpoint control in classrooms.
2. In common areas, bathrooms and hallways thermostats must be a flat plate sensor mounted to a 2 in. x 4 in. box.
3. Do not mount thermostat in gym area to padded walls.

Sensors must be accessible. Do not mount above sheet rock ceilings.

The energy management system shall have a data drop in the boiler room and one common enthalpy setpoint for each air handler.

The use of roof mounted direct drive exhaust fans is preferred for low-sloped roofs. Permanent means of roof access will need to be provided to access any equipment located on the roof. Locate all roof mounted equipment a minimum of 15'-0" from the edge of the roof.

Roof mounted exhaust fans shall be secured to the roof curb with a minimum of 2 stainless steel fasteners and EPDM washers for each side of roof curb.

The Building Automation System (BAS) shall monitor all gas and water meters. Gas meters shall be AGA listed, approved by local utility provider and capable of producing a pulse output for monitoring through the BAS. Water meters shall be approved by local utility provider and capable of producing a pulse output for monitoring through the BAS.

All air handling equipment, pumps, motors, valves etc., shall be mounted in areas easily accessible for routine maintenance. Grease fitting for bearings shall be piped to the outside. Provide 3 ft. clearance, minimum, around equipment for access to motors, compressors, bearings, controls, filters, valves, etc. Provide filter change space and coil pull space. The access doors should not require maintenance personnel to use tools to open. Locate relative equipment together, i.e. in the same room and on the same floor. Do not layout equipment rooms such that equipment, piping and/or duct work must be removed to perform maintenance. Do not locate equipment overhead.

Engineer shall provide standard electrical connection detail on plumbing and mechanical plans, to clearly indicate the trade responsibility for disconnect switches, starters, and final connections.

Allow room in all mechanical rooms and all other heavily concentrated areas for pull spaces for equipment, (coils, motors, etc.) and maintenance space for equipment (filter change out, lubrication, belt replacement, bearing replacement, compressor replacement, valve maintenance, etc.). Also allow a minimum of three (3) ft. of clearance around all mechanical and electrical equipment including wall clearances. Show greater clearance where recommended by manufacturer.

Access to mezzanine mechanical rooms shall be stairwell (not a ship's ladder) leading up to the mezzanine mechanical room with a minimum width of 4 ft. Design insulated walls around the mezzanine mechanical rooms with a waterproof membrane and floor drains in the floor. Provide hoist where necessary to install and service equipment. Coordinate this between Designer/Engineer.

Engineer shall not locate noisy outdoor equipment (i.e., chillers, cooling towers, etc.) in locations that will result in complaints from adjacent property owners.

NATURAL GAS SYSTEMS

Engineer and Contractor shall coordinate with Gas Company and have high pressure gas line routed to gas meter.

Engineer shall alert Owner if costs are involved.

Plumbing contractor shall connect to load side of meter and extend inside building.

Provide main gas valve above ground prior to entrance to building. Use ball valves.

All new gas meters shall be capable of reporting gas consumption to the Building Automation System.

1. Meter to be BACnet compatible.
2. Provide conduit from meter to nearest mechanical room.
3. Provide bollards at gas meter.

Piping - Black steel pipe schedule 40 ASTM A 120.

Fittings - malleable - iron threaded fittings, Class 150.

Joints - threaded joints for 2 in. and smaller, welded joints for 2-1/2 in. and larger.

Gas piping may be installed above accessible (lay-in) ceiling.

1. Do not locate gas piping under floor slab and inside solid partitions including CMU.
2. Provide accessible chases for concealed gas piping. I.E. floor trench.
3. Route gas piping exposed where possible.

Provide full port gas shut off valves with gauge tapping at each piece of equipment.

Provide key operated solenoid gas valve for each kitchen and High School science lab.

1. Do not allow fork type keys to be used. Key switch labeled "GAS", with engraved plastic laminate, shall show "ON" and "OFF" position.
2. Valve shall be normally closed.

Provide final connections to equipment with flexible connectors.

Provide 6 in. dirt leg at each vertical rise and prior to each equipment connection.

Contractor to paint all exposed exterior and mechanical room gas piping yellow, with one primer coat and (2) two coats of oil based paint.

All gas piping shall be tested at a test pressure of 100-psi minimum for a period of not less than eight (8) hours. Test to be conducted using a chart recorder by the installing contractor. Chart size to be 8 in., range to be 0 to 150-psi with a 24 hour recording time. Pressure measuring elements to be heat-treated to prevent hysteresis-related inaccuracies. Engineer to witness all tests. Contractor to turn over chart in close-out documents to Owner.

Gas piping to classrooms shall have emergency cutoff located at the exit doorways.

HVAC PIPING SYSTEMS

Engineer shall specify and show on plans expansion loops on all hot water and steam piping runs over 200 feet in length.

Support piping as recommended in ASME Handbook. Do not support piping from bar joist bridging.

Paint and color-code all exposed piping system.

All exposed piping, both insulated and uninsulated shall be painted and labeled. 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 partition:

1. Chilled water - Light Blue
2. Hot water - Light Red
3. Dual Temperature Orange
4. Make up water Green
5. Gas Lines - Yellow

All underground lines shall be marked with a bright colored continuous - printed plastic tape on top of the line.

Provide positive freeze protection for all water systems subject to freezing conditions such as air-cooled outdoor chillers, cooling towers, outdoor piping (above ground) etc.

All piping systems shall be thoroughly flushed out before placing in operation. This is especially critical for all hydronic systems. Hydronic systems shall be connected so as to by-pass the units before 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.

Provide additional bulb wells in central plant piping for electronic sensors. Coordinate with the Maintenance Department for locations of additional wells.

Provide shut-off valves for all hydronic mains at all take-offs to mechanical rooms and pump rooms.

All equipment shall have shut-off valves at the supply and return side to provide for removal and repair.

All relief valves shall have a union near valve to allow for future relief valve replacement.

All chilled water piping shall have 2 in. thick fiberglass insulation all with a vapor-proof jacket.

Specify canvas jacket lagged in place for painting on all exposed piping in occupied spaces and mechanical rooms.

Provide specification section on pressure testing of all piping systems.

Insulate all hot water and domestic hot and cold water with 1 in thick fiberglass insulation.

Specify brass or stainless steel fittings for domestic hot water systems or tanks.

All water make-up assemblies shall be provided with a backflow preventer.

Specify an aluminum jacket on all outdoor piping.

All joints and longitudinal seams shall be sealed watertight.

Provide caution labels on all heat traced piping systems.

Provide automatic chemical feed systems to all "open" systems.

Pipes venting gas from appliances or other devices shall terminate outside the building 2 ft. above any roof line within 10 ft. Keep 30 feet away from louvers and overhangs.

Compression type fittings on gas piping are not permitted.

Specify all pipe supports to have saddles and blocking and all exposed piping, hangers, saddles and supports to be painted with two (2) coats.

Specify all exposed piping in occupied spaces below eight feet to be covered with a 20 gauge smooth aluminum or PVC jacket.

Provide chrome escutcheon rings at all exposed ceiling and wall pipe penetrations.

Show by-pass piping for all heat exchangers.

Specify all damper operators, control and service valves to be installed such that they can be serviced by personnel standing on the floor of the Mechanical Room.

Engineer shall require contractor to 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.

Use automatic flow control valves on all hydronic systems.

Camera all drain lines and submit video to Owner.

DUCTWORK

All ductwork except kitchen hood and certain other hood exhaust shall be galvanized sheet metal with zinc coating complying with ASTM A527 and SMACNA standards.

Exposed ductwork shall be mill phosphatized for painting.

Low-pressure ductwork shall be rectangular. Medium and high-pressure ductwork shall be spiral round or flat-oval duct, as space permits.

Insulate all ductwork, except exhaust ductwork, by wrapping with minimum 2 in. thick fiberglass insulation with vapor proof jacket.

Exposed ductwork shall be double wall insulated spiral duct with paint grip finish. Discuss with CCS the use of exposed ductwork prior to incorporating it into any design.

Flexible ducts may be used for above ceiling lay-in system. Flexible ducts to be UL 30 181/Class 1 insulated type with foil wrapper.

Use fabric ducts in gymnasiums and large open spaces.

Seal all ductwork joints, seams and take-offs airtight with non-hardening mastic or liquid elastic sealant. Engineer to witness ducts have been sealed before ducts can be insulated.

Do not support ductwork from bar joist bridging.

Support all flexible ducts a maximum of 5 ft. on center and at all changes in direction so as to prevent sagging and crimping from occurring. Note: All flex duct to receive a minimum of one (1) duct hanger.

No exterior ductwork will be allowed, except with roof top units and then supply and return shall be less than 5 ft - 0 in, and a screen shall be provided, if ductwork can be seen.

DIFFUSERS, REGISTERS AND GRILLES

Aluminum diffusers and grilles shall be specified for moist and humid locations (i.e., Kitchens, food preparation areas, locker rooms, showers and training rooms).

Provide heavy duty steel return air grilles located in gymnasiums, multi-purpose rooms and in all locations where the grille is within 8 ft. of the floor. Grilles shall be all welded construction with 1/8 in. thick grille blades, 14 gauge blade mullions on 6 in. centers with 18 gauge frame reinforced at the corners.

Engineer shall show location of all balancing dampers on plans. Manual balancing dampers (MBD) shall be provided at each branch take-off. MBD's must have locking quadrant and 29 stand-off (for insulation).

Air distribution shall provide heat to floor level.

Install minimum 1 1/2" thick fiberglass blanket insulation with vapor retarder jacket (FSK) securely taped to the backside (Plenum side) of all supply diffusers installed in lay-in ceiling assemblies to prohibit formation of condensate on diffuser surface.



INTEGRATED AUTOMATION DESIGN GUIDELINES

Facility Services: Division 25

Division 25 – Integrated Automation

BUILDING AUTOMATION AND CONTROL SYSTEM (BAS)

For minor renovations where the existing Building Control and Automation System will remain as directed by the Owner, the Building Automation System shall be a Direct Digital Control System and shall be a completely compatible system in all respects to the system currently in use by the Maintenance Department of the CCS. However the designer shall have the option to submit a cost comparison for a renovation project should the installation of a new DDC system be cost prohibitive. Contact the Maintenance Department of CCS for guidance and questions. All major addition/renovation projects as directed by the Owner shall have a base bid for a web-based control system and a bid alternate from selected manufacturers pre-approved by the CCS Board of Education for a web-based control system. Contact the Maintenance Department of CCS for guidance and questions. All new schools as directed by the Owner shall have a base bid for a web-based control system and a bid alternate from selected manufacturers pre-approved by the CCS Maintenance Department for a web-based control system. Contact the Facilities Department of CCS for guidance and questions.

All control sequences shall be discussed with Maintenance and agreeable to both the Engineer and Maintenance. A clear written sequence of operation shall be an integral part of the design. Sequence of operation shall follow equipment manufacturer's recommendations. Engineer to show a complete control sequence and a control diagram on the drawings. All sensor and EMS panel locations shall be discussed with Maintenance and clearly shown. Any field modifications must be approved by Engineer and Maintenance. Acceptable height of control panels is 60 in. above finish floor. Specify lightning and surge protection on all building automation system panels and telephone modems associated with these systems. Specify momentary contact push button for night override in a flush mounted panel located in the administrative area corresponding to zones in the school. This requirement is for minor renovations only where the existing BAS system will remain.

All temperature sensors shall be flush mount, stainless steel (10K thermostat).

Acceptable Manufacturers:

1. Mamac.
2. Trane.
3. DDC System.

Mechanical Contractor shall provide temperature input from each walk-in cooler and freezer to building automation system for system "high/low" alarm. Controls contractor shall be responsible for completely testing Control System for proper operations including each control device and also running system through the entire control sequence. Control System Contractor shall submit all job specific

“Field Check-Out Sheets” for each system or controlled device. This shall include device setpoints, fail-safe settings, correction factors, initial and final settings and adjustments and valve or damper position verification. An Owner Representative shall be present.

Acceptable Manufacturers:

1. Trane.
2. Semeins.
3. Yamas.

TIME SYSTEM

Provide complete synchronized wireless master-satellite time system.

Time system shall be a synchronized master-satellite time system.

1. The system shall synchronize all clocks to each other.
2. The system shall utilize GPS technology to provide atomic time.
3. The system shall not require hard wiring.
4. Clocks shall automatically adjust for daylight savings time.

Clocks shall be synchronized to within 10 milliseconds 6 times per day, and the system shall have an internal oscillator that maintains plus or minus one second per day between synchronizations, so that clock accuracy shall not exceed plus or minus 0.2 seconds.

The system shall include internal clock so that failure of the GPS signal shall not cause the clocks to fail in indicating time.

The system shall incorporate fail-safe design so that failure of any component shall not cause failure of the system. Upon restoration of power or repair of failed component, the system shall resume normal operation without the need to reset the system or any component thereof.

Clock locations shall be as indicated, and clocks shall be fully portable, capable of being relocated at any time.



ELECTRICAL DESIGN GUIDELINES

Facility Services: Division 26

Division 26 – Electrical

GENERAL ELECTRICAL REQUIREMENTS

The electrical contractor shall provide all power wiring and connection to each piece of mechanical equipment. Electrical contractor shall provide disconnect switches and/or combination starters to all mechanical and plumbing equipment. Mechanical contractor shall provide variable frequency drive units for all fans and air handling equipment.

All points for future connections shall also be clearly shown and labeled on the drawings with the capacity (GPM, Tons, kW, etc.) that is available for future at each connection point.

ENERGY CONSERVATION - See Section "Sustainable Design Guidelines".

Specify that all warranties shall commence from the date of Substantial Completion, not from the start-up date of the equipment.

Engineer shall be required to incorporate the EPA "Green Lights" program and "Energy Star" program requirements for all designs.

All electrical systems main service equipment and panelboards shall be designed with 25% minimum spare capacity, both physically and electrically, for future growth capabilities.

In any building where future expansion is definitely planned, as conveyed by CCS, the Engineer shall provide adequate capacity and connection points in the electrical systems as directed by CCS. The additional capacity shall be clearly noted on the front of the electrical drawings.

Provide ten (10) 3/4 in. spare conduits for all recessed panelboards to stub out above lay-in ceilings.

Provide lightning and surge suppression on all security, intercom, Building Automation System (BAS), MATV and fire alarm systems.

Provide transient voltage surge suppression (TVSS) for main electrical switchboard and all branch circuit panel boards serving computers and electronic loads. TVSS equipment to have a five year warranty, a high-frequency extended range tracking filter and integral fused and safety interlocked disconnect switch located in the unit enclosure with an externally mounted manual operator. The TVSS shall be rated on a per mode basis and have a rating of not less than 200kA for switchboard service entrance and 100kA for panel boards. This rating shall apply per mode and all applicable modes L-N, L-G, N-G, L-L as applicable.

Provide phase loss protection within motor starters and VFD's serving HVAC motors, compressors, and pumps.

Electrical Contractor shall provide conduit and pull string from demand meters (gas and water) to main Mechanical Room (or the closest point of access to the Building Automation System network).

Electrical Contractor shall provide dedicated and protected 120V power to all HVAC control panels and damper operators. Provide junction box and on/off service switch directly over control panel.

Electrical Contractor shall provide a telephone jack in each mechanical room.

Engineer shall require contractor to dimension actual location of all underground conduits on as-built drawings. A minimum of two dimensions from building reference points shall be provided and a bury depth indicated.

Provide 120 V power to kiln exhaust fan. Locate this receptacle a maximum of 4 ft. away from kiln.

Label room numbers.

CONDUIT

Conduit Uses:

1. Rigid steel conduit or IMC may be used for underground branch circuit wiring without concrete encasement. All rigid steel and IMC feeder conduits shall be encased with 3 in. of concrete on all sides. All branch circuits exposed less than 8 ft. above finish floor and all feeder conduits run above grade shall be in rigid steel conduit or IMC.
2. PVC conduit may be used without concrete encasement for branch circuits directly under concrete slabs. Provide rigid steel elbow when turning up out of the slab inside walls to the first junction box. Outside the building slab, all PVC feeder conduits shall be encased in 3 in. of concrete on all sides.
3. EMT may be used inside walls, in ceilings and exposed above 8 ft. above finish floor.
4. Plastic bushings or insulated throat connectors shall be used in all conduit terminations.
5. Conduit shall be used in walls, from the outlet to the ceiling, for public address, intercom and MATV wiring.
6. Conduit is not required above accessible ceilings for public address, intercom or MATV wiring.
7. Provide plenum rated cable where necessary.
8. Provide steel conduit systems in all areas of exposed structure.

PANELBOARDS

NEC required clearances shall be required around all panelboards.

All panelboards shall be selected for 25% minimum spare electrical and physical capacity above the anticipated demand load.

SERVICE ENTRANCE

The engineer shall coordinate with power supplier and indicate all requirements for:

1. Point of service

2. Division of work (contractor and power company)
3. Fault current: Over-current device(s) shall have interrupting capacity in excess of available fault current throughout system.
4. Engineer shall alert CCS of any potential costs from Power Company.
5. Service Entrance equipment shall incorporate a demand meter.

There shall be one service for the entire facility with one disconnect.

The electrical design shall include conduit for the electric service entrance under all paved areas.

LIGHTING

These requirements pertain to all interior, exterior canopy and exterior building lighting.

Generally site lighting, such as for parking lots, is provided by the Power Company or others and is not a requirement of the building work. Coordinate with CCS concerning the outdoor lighting requirements.

All lighting systems shall be designed based on IES and ANSI schoolhouse lighting standards. Lighting systems in gymnasiums shall meet the standards set by the NCHSAA for basketball, volleyball and wrestling.

Discuss lighting ideas and control strategies with CCS Facilities and Operations offices before design and layout of lighting systems.

Area lighting shall be designed and provided by Power Company. Engineer to send set of plans to Power Company at the Design Development stage.

Power Company area lighting shall be shown on site plan prior to 100% Construction Documents submittal.

Electrical contractor to provide conduit from area lights located in paved areas to adjacent non-paved surface.

Engineer shall review Power Company area lights and provide additional exterior building lighting (wall packs) as needed to insure that all exterior entrances and first floor windows are illuminated.

Do not locate light fixtures over stairwells. Use wall mounted light fixtures to light stairwells.

The use of indirect lighting in areas of high computer concentration is acceptable.

Metal halide fixtures with color corrected lamps and automatic restrike may be used in gyms, multi-purpose rooms, high corridors and high media center ceilings.

High-pressure sodium fixtures shall be used for exterior corridors, walkways and on the building facade.

Fluorescent lighting shall be laid out so that long dimensions are parallel with dry erase boards on primary wall. If no dry erase boards are present then fixtures should be parallel to cabinets and shelves.

All interior corridors and group toilet lights shall be controlled by a switch at front desk in Administration area and the use of lighting contactors. Provide ON/OFF switch for each lighting contactor. Location of all lighting contactors to be clearly identified on plans.

Design consultants are requested to comply with the latest North Carolina Energy Code for automatic shutoff of lighting in classrooms and other applicable spaces.

Since lighting concepts are constantly evolving as technology is developed, design consultants should present cost effective alternatives with anticipated payback.

Provide minimal night lighting in corridors and stairs.

Provide separate light switches for banks of lights in front of large windows or doors where natural light is available.

All classrooms, labs, and other rooms greater than 100 sq. ft. shall have two level lighting with two (2) circuits per fixture controlled by two (2) single pole light switches.

When fixtures are used which require a warm-up, switches need to be located to assure against accidental or malicious switching. If the switches cannot be located in a secure location, then locking switches are required.

Exterior lighting shall be provided for building entrances, outdoor storage areas, loading docks, bus ports, covered walkways, exterior mechanical room doors and other outdoor areas where in the judgment of the engineer or CCS, lighting is required for night functions, security or safety.

Exterior lighting shall be controlled through lighting contractor: photocell and time clock. Provide contractor with H-O-A switch. Location of all lighting contactors to be clearly identified on plans.

Lighting calculations: shall be based on room surface reflectance for interior finishes selected by the Designer, which in all cases shall not be less than the following for instructional areas: Ceiling Cavity - 80%, Walls - 50%, Floor Cavity - 20%.

Lighting calculations: The illumination levels shown in this section are recommended maintained design levels.

Engineer shall furnish a copy of all lighting calculations to the Owner for review.

Due to constantly changing lighting technology, special designs not strictly adhering to the preceding recommended light levels, but still meeting the lighting

needs in the engineer's opinion, will not be prohibited but should have prior approval of the CCS.

EXIT SIGNS

If a generator is not provided, dual voltage (120/277) LED exit signs with Ni-cad battery shall be provided and installed by the electrical contractor. Exit signs have universal mounting capability (top, back or end) and a canopy is included. Contractor shall be responsible for field conversion to double face where required (extra face plate furnished with exit sign). Contractor shall also be responsible for snap out directional chevron indicators.

Exit signs and directional signs related thereto shall be provided with power from two sources. The primary source may be connected at any point within the normal lighting system. The secondary source shall operate automatically upon interruption of the primary source and shall be self-contained batteries unless a building emergency generator is provided. Batteries shall not be provided within fluorescent fixtures.

Exit signs and directional signs related thereto shall be provided at all exit doors and as required to mark egress routes.

EMERGENCY LIGHTING

An emergency generator shall be provided. In case of power failure, the following items shall be powered by the emergency generator:

1. Emergency lighting/Exit signs
2. Fire Alarm
3. Elevator (if used)
4. Elevator Lights
5. Sprinkler pump
6. Cooler/Freezer
7. Telephone system

Emergency lighting shall be provided with power from two sources. The primary source may be connected at any point within the normal lighting system. The secondary source shall operate automatically upon interruption of the primary source and shall be self-contained batteries unless a building emergency generator is provided.

The following areas shall have emergency illumination, whether having natural lighting or not:

1. Exits and exit access corridors
2. Small and large assembly areas
3. Areas occupied by over 50 persons
4. Gymnasium dressing rooms
5. Band and choral rooms
6. Industrial arts, prevocational and shops
7. Administration or other building control centers
8. Kitchens
9. Group toilets
10. Main electrical service disconnect location
11. Main mechanical/boiler room

12. Mechanical mezzanines
13. Mechanical rooms
14. Emergency power equipment location

LIGHTING SYSTEM SECURITY

All practical measures should be taken to provide protection for lighting fixtures and equipment.

Vandal-resistant materials or metal guards shall be used for fixtures within reach of floors and all outdoor locations.

Mounting heights should be specified to afford protection, consistent with ease of maintenance. Mount light fixtures in stairwells 10 ft. above landing floors.

Exit signs and directional signs related thereto should be wall-mounted where possible in lieu of ceiling-mounted, as ceiling-mounted signs are subject to a much greater degree of abuse. Signs must be visible from anywhere within the length of an exit access corridor or directional signs shall be provided.

Certify foot-candle levels at job completion documents and provide report to Owner as part of closeout.

LIGHTING LEVEL TABLE

Type of Interior Areas	Recommended Minimum Maintained Level	Remarks
All interior areas other than listed below	60 foot-candles	
Industrial art, prevocational or trade and 70 foot candles industrial shops, laboratory and lecture room demonstration areas, and task lighting areas.	70 foot candles	
Gymnasiums/Multipurpose Rooms	50 foot candles	
Cafeterias and commons, stairways, and Auditorium seating auditorium seating areas	30 foot candles	Auditorium seating areas need 30 foot candles at full bright dimmer setting
Corridors, toilet areas, dressing rooms, 25 foot candles storage rooms and boiler, mechanical or electrical rooms	25 foot candles	



COMMUNICATIONS DESIGN GUIDELINES

Facility Services: Division 27

Division 27 – Communications

STRUCTURED CABLING

Wiring Closets

Wiring closets are designated (at design time) by the architect. However, it will be the responsibility of the vendor to identify any additional requirements of space, HVAC, or A/C power and any other problems with the CCS Director of Construction for resolution.

Phone Requirements

All voice jacks shall be wired with l(one) 4-pair CAT-6 cable each and terminated on an RJ45 jack at the phone end, and on a Type R66 block in the wiring closet(s) unless instructed otherwise (see below).

The main administrative office area phones ONLY will utilize VOIP and shall be wired as such. They will be wired by terminating on an RJ45 jack at the phone end and a patch panel in the closet of origination that supports the main administrative office area. All others can be connected by using Type R66 block in each wiring closet. All cables/ports shall be labeled on both ends.

In addition to designated blueprint voice lines, add two (2) hard-wired phones in administration area. Requirement includes one (1) at receptionist desk and one (1) in principal's office.

A 2-post 19 inch rack is to be provided for phone equipment in the main wiring closet.

A 50-pair voice cable is to be installed from the MDF closet to all Intermediate Data Facility (IDF) closets and punched down on approved punch blocks. The quantity of cable pairs will be reviewed based on the size of each school.

A 1500 Liebert/Emerson UPS rated at 120 volts is to be provided for the phone system by the voice system contractor responsible for the voice system infrastructure.

The data/voice contractor will be responsible for providing all %" x4' x 8' AC-grade plywood that is needed in all wiring closets unless it is shown as a detail under the electrical requirements by the architect that the Electrical Contractor is to provide this item.

The data/voice contractor is responsible for terminations of all data and voice wiring at each end of the cable run as well as labeling and performing acceptance testing and documentation.

The speaker/i-com system shall have an individual separate, 22 gauge, plenum rated, shielded, and stranded two pair speaker cable for each talk-back speaker (all classrooms, Media Center, and labs). All remaining speaker(s) locations shall be considered to be one-way speakers and may be wired in a "daisy-chain" manner with no more than seven speakers being on an individual cable run. The one-way speakers shall use 22 gauge, plenum rated, shielded, and stranded two pair speaker cable as needed for all one-way speakers. ALL speaker wiring shall utilize two-pair, 22 gauge, plenum rated, shielded, and stranded cable regardless of its application usage as stated above.

Cables

The proposed cable for the SCS is a four (4) pair, CAT6 UTP plenum, manufactured by Berk-Tek or equivalent. All cable drops installed in the SCS will be identified on the floor plan as provided by the CCS Technology Department. All cable drops shall be installed in all locations as the floor plans indicate. All CAT6 cables designated for data lines shall be blue in color. All CAT6 cables designated for voice lines shall be yellow in color. The only exception is Flood rated cables that are installed in the slab which are black in color.

All cable drops will be installed using defined cable routes. If a distance of 90 meters or less cannot be achieved using the specified routes, the Technology Department should be notified and a solution will be determined. All CAT6 patch cables at the main and remote wiring closets should be of the "open hood" (no boot) design. All patch cables shall be purchased and given to the Owner for installation. A total of two (2) patch cables per drop will be needed.

All patch cables for connections to computer workstations shall be blue, open hood (no boot), and 10' in length. In the data closets, for connection of patch panel ports to switches for regular classroom(s), labs, etc. the patch cables shall be blue and 5' in length. For the Administration area VOIP voice lines only, the patch cables for connection of patch panel ports to switches shall be yellow and 5' in length.

All fiber optics jumper cables should have LC to LC connectors @ 50 micron and be of sufficient length to reach from the optical patch panel to the server location. The number of fiber optic cables provided should equal the number of optical connections required by the electronics backbone plus two (2) at the main and each remote wiring closet location. The CCS Technology Department will assume the responsibility for the server connections and configurations.

Outlets

Outlets (rj-45) will be Panduit CJ688TGIW. There are numerous faceplate designs for Panduit rj-45 jacks. They can be any type that supports a CJ688TGIW jack and meets the following requirements. Each outlet location identified will consist of a single-gang faceplate capable of supporting one (1) to four (4) eight position jacks. The faceplate will be mounted flush to the wall whenever possible. All wall drops will utilize existing conduit or be fished, if necessary, where possible. If a wall cannot be fished, surface raceway will be installed with a single-gang surface mounted box only with approval from the CCS Technology

Department. Each jack will be labeled and installed in the faceplate based on the cable id number. In the event of more than one jack per outlet, the lowest number will start in the top left corner. Jacks will then be added in the order of "left to right" along the top row, proceeding in the same manner on succeeding rows. The faceplate will have a visibly defined area at the top or bottom for labeling.

Cabling Pathways

All horizontal cables will be routed using existing cable trays, cable hangers and raceway. All cables will be routed using the shortest possible distances. If obstructions are found that require re-routing a cable, the Owner's Coordinator will be notified. At each TOC location, the CAT6 cable will be installed in existing conduit or inside the wall, permitting that the wall can be fished. If the wall cannot be fished, quality cable raceway will be used. All fittings will be PANWAY CAT6 Cable compliant. If multiple continuous sections of raceway are required, fitting will be used to cover the exposed joint. All outlets are to be installed 18 inches from the finished floor. If this distance cannot be achieved, the closet location may be used.

Horizontal Under Slab / Floor Box Cabling

Any cable (data or voice) that is known to and will be installed in conduit that is located in the concrete slab of the building shall be Flood rated CAT6 cable, CommScope 6NF4+ or equivalent with a consolidation/transition point located above the ceiling within the 50ft plenum limitation of the Outdoor/Flood rated cable plenum space penetration.

All floor boxes shall use Flood rated CAT6 cable and shall go by the same guidelines as mentioned above. The transition point can be Panduit WMCPEGBL or equivalent.

Horizontal Patch Panels

Backbone cable support is to be installed prior to the vendor's start date. Any additional cables requiring support (not accommodated by the installed basic system) will be attached to the building truss structure using various sized hanging devices manufactured by Caddy, B-Line or equivalent. If the truss structure cannot be used, hanging devices will be installed into the decking of the ceiling. Support anchors will be installed using a fastening system, which complies with OSHA regulations and ANSI standards. Cable bundles will be neatly tied together at regular intervals to eliminate cable separation and sagging.

All cables are to be terminated on a CAT6, 110-patch panel. Each patch panel used for this installation is to have the following characteristics:

1. Support 24 or 48 cable terminations
2. 110-type termination on the rear of the panel
3. Eight position jacks on the patch panel
4. 568B wiring scheme
5. Rack mountable
6. Rear cable support for attaching UTP Cables
7. If Panduit patch panels are used they can be of the RJ-45 type using CJ688TGIW jacks

Racks/Equipment

Each rack installed in the SCS will have the following Characteristics:

1. Meet Electronic Industry Alliance (EIA) Standards
2. Open Frame Structure racks two - 4 post design rack in MDF. One 2 post design rack for phone equipment in MDF. One 2-post design rack in all IDF's.
3. 84 inches in height, stand alone
4. Support for 19 inch wide components
5. A minimum of 36" of clearance from the back wall to the center of the rack is to be used when mounting the racks to the floor.
6. Brushed Aluminum Material or black
7. Secured to the wall and floor and be Properly Grounded per NEC 64.15 Code.
8. "Panduit" brand wire management is preferred both horizontally and vertically. If any other manufacturer is to be used it must be approved by the Technology Department prior to purchase and installation. Failure to notify this department may result in a change out of materials at the voice/data contractors expense.

Rack layouts should be in this order from top to bottom: Fiber terminations, horizontal wire management, 48 or 96 space patch panel, horizontal wire management, HP blade-type switch, horizontal wire management, 48 or 96 space patch panel, horizontal wire management. Both sides shall have vertical wire management as well. The bottoms of each rack will be used for UPS mounting.

The second rack in the MDF is to be used for servers, shelf/monitors, and phone equipment, etc.

Three (3) Liebert/Emerson 1500 UPS' rated at 120 volts shall be provided by the data contractor responsible for the data infrastructure. These will be used in the MDF.

One (1) rack mountable power strip shall be provided for each rack installed throughout the school.

The CCS Technology Department will be responsible for all switches in the MDF and IDF's. They will not be included in the bid price.

Backbone Feeder Cables

The type of fiber cable required to implement the backbone cabling system will meet the IEEE 802.3ae standard for 10 Gb/s Ethernet. NOTE: It specifies a 2000 MHz km bandwidth for 50 micron (not 62.5m/125um) fiber operating with 850 nm VCSELs. This backbone shall be Multi-mode Fiber Optic Cable and be "armor-clad" or protected by "inner duct" of sufficient diameter.

Backbone Cable Support

The backbone cable support system used for the installation will be the same as defined in the section "Horizontal Cable Support".

Backbone Termination Panels

All fiber optic cables will terminate on rack-mounted panels at each location. **A sufficient number of (50 micron) jumper cables, with proper connectors, will be provided as part of the SCS. These jumpers shall have LC to LC connectors.** A ten-foot service loop will be maintained at each cable end. Each fiber strand will be field terminated with LC type connectors and attached to a coupler position in the panel. All fiber panels will be labeled in compliance with the drawings. They shall be labeled to show each destination point in each IDF.

Firestopping and Sleeves

Provide for the installation of all conduits and sleeves through firewalls and install fire stop after cabling installation as required to meet local building codes unless this is covered under the General Contractors scope of work.

At locations where a penetration was made through a fire-rated wall, an approved fire stopping method will be used to re-seal the penetration. All local building codes and guidelines defined in the EIA/TIA-569 must be met.

If the data/voice contractor has to make penetrations in a firewall they shall be responsible for fire stopping their penetrations. All firewall penetrations will have an EMT metal sleeve (with proper "cable-shear" protection) installed prior to cable routing. The outside of each sleeve will be sealed using a fire-caulk compound. If the wall is a smoke or fire rated wall, the inside cavity of the sleeve will be sealed using a fire-putty compound. Some sleeves may require the installation of rock wool to fill large void areas.

Labeling

All cables and termination hardware will be labeled by the data/voice contractor as specified by the CCS Technology Department. Each cable end will be marked using a machine-generated label at a location near the termination panel. All cable identifications will correspond to the Owner provided blueprints.

A wall data jack shall be labeled as its destination (MDF or IDF), patch panel, port #. Example MDF- A-1.

A patch panel termination port shall be labeled as its destination (room 567), port # (1, 2, 3, etc.) Example: 567-1, 567-2, 567-3.

Installation Practices

The installation methods used for the SCS will follow guidelines defined in EIA/TIA-A-568-A as well as each manufactured piece of equipment installed. If conditions do not allow the guidelines to be met, the Owner's Coordinator will be notified.



EARTHWORK, EXTERIOR IMPROVEMENTS AND UTILITIES DESIGN GUIDELINES

Site and Infrastructure: Divisions 31 - 33

Division 31 – Earthwork

EROSION CONTROL

Consideration shall be given to the downstream resource that is to be protected (i.e., private lake; water supply reservoir; densely populated urban setting; wetlands; other significant resources).

Consideration shall be given, if the site is wooded, to provide a clearing and grubbing erosion and sedimentation control plan.

The site designer shall consider the need for a phased approach to the sediment and erosion control process or plan development.

Site designers shall size site retention capacity (temporary and permanent) per local jurisdiction.

Site designers shall use local jurisdiction's criteria when calculating site water flow rates unless there is a critical situation such as flooding the building or adjacent properties. Site designers shall be required to notify the Owner in writing of any and all critical situations.

SLOPE PROTECTION

Designer shall allow for storm drainage away from building, parking areas and driveways.

Consider flow of concentrated storm drainage, design to slow down velocity. Concentrated drainage across walks shall not be allowed, nor will ponding be allowed.

Discharge from canopies shall be directed away from walks and tied into underground storm drain line system.

All drainage shall be directed into underground storm drains, including roof downspouts.

Top of finish grade next to exterior walls generally shall be set a minimum of 8 in. below top of finish floor except where grade transitions prohibit this and at building entrance locations.

All slopes shall be equal to or less than 1 in 3. Slopes steeper than this shall only be done after Owner's written approval. If approved, excelsior/erosion control blankets shall be installed.

The recommended slope for paving is between 1% and 2%. Slopes in excess of 5% will not be permitted except in special circumstances where the Owner's prior approval will be required.

Do not stockpile excavations permanently on site.

All slopes shall be stabilized within 21 calendar days after final grade completion.

SITE DEVELOPMENT DESIGN CONSIDERATIONS

There are various issues, which need to be addressed in the site design of a school. These considerations include but are not limited to:

1. The allowance for future building expansion and accommodation of future re-locatable classrooms.
2. The development of circulation patterns that separate pedestrian from vehicular traffic, the bus drop/parking from the parent drop off and staff parking from student parking
3. Special consideration shall be given to the drop off location of special needs buses.
4. Main building entrances which are readily identifiable
5. Building orientations and configurations which conserve energy and allow for natural day-lighting and ventilation
6. The utilization of exterior terraces/patios for outdoor learning areas.
7. Providing handicap accessibility to all buildings and play areas as per Building Code and ADA requirements.
8. The identification and preservation of natural site features such as rock outcroppings and wooded areas to be used to enhance the science program.
9. Minimize the building's environmental impact on the site, i.e.:
 - a. run-off control (watershed issue)
 - b. minimize excavation
 - c. protect trees
 - d. minimize grounds maintenance
 - e. protect wetlands
 - f. soil conditions

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. Allow for four (4) 24 ft x 36 ft (typical) future mobile units at Elementary School sites and for six (6) future mobile units at Middle and High School sites. Units will not be shown on Contract Documents but grading shall be shown. Mobile Units cannot be set closer than 30 feet from the main building and must maintain a minimum of 20 feet between mobile units. The distance between mobile units is measured building to building. Stairs and ramps are constructed within this 20-foot area at opposite ends of one another.

1. The maximum distance from mobile units to toilets/restrooms shall not exceed 200 feet (or maximum distance allowed per code).
2. If a portable toilet facility is used, then the maximum distance from any mobile unit to the main permanent building shall not exceed 400 feet.
3. Electrical service to each mobile unit shall be a minimum of 100 Amps service.
4. The Intercom and MATV systems shall be sized to accommodate the mobile units.

5. The CCS technology department shall be contacted regarding requirements for data connections to mobile units.
6. Electrical conduit and/or boxes to mobile units shall be clearly identified and provided with pull-strings.
7. Access to site for mobiles shall be a minimum of 25 feet clear for delivery with a turning radius to accommodate a rig approximately 50 feet in length. Designer shall design infrastructure for mobiles to be added in the future. (This includes rough grading, electrical, sewage and water).

BUS DROP OFF, PARENT DROP OFF AND CAR STACKING/PARKING: Provide separate exit / entrance drive for bus parking and drop off, and visitors loading and drop off. Provide car stacking for peak flow during drop off and pick up of students. These three functions shall be separated. If they are not separated, designer must get owner approval. At all drop off areas the discharge or pick-up of students at the loading-unloading zones shall be from the side of the vehicle opposite the driver and towards the building.

1. Refer to the NC Department of Public Instruction School Site Planner for design guidelines for bus parking and loading areas.
2. Refer to the current Cabarrus County Zoning Ordinance, Chapter 10, Table 10-6 for parking space requirements.
3. All parking spaces and drives shall be properly lined and have signage indicating exits and entrances.
4. Entrance and exit driveways should be located to maximize visibility and with consideration for traffic flow during school hours.
5. Visitor parking spaces shall be near the main entrance of the building and closer to the building than the staff parking.
6. Sidewalks should be provided adjacent to all parking lots with curb cuts at each intersection.
7. Pedestrians and bicyclists shall have a designated safe path between any road and the school building.
8. Parking bays for full-service buses shall be a minimum of 15 ft. wide. Special needs buses should drop off near the main entrance with a preferred location of their own, if feasible. Provide maneuvering for large delivery trucks to loading area even when bus parking and visitor/staff parking areas are occupied.
9. Linear sidewalks shall be provided at each loading/unloading area.
10. All primary building entrances used for students shall be protected from weather by overhead cover or soffit. It is recommended that each loading/unloading area have a covered canopy and covered walkway leading into the building. At all schools it is recommended the bus drop canopy be a minimum of 12 ft. wide and 50 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 curbs a minimum of 4 ft. to allow car or bus doors to open. Canopies shall be designed to avoid roosting of birds.
11. All parking and drop off areas shall be well illuminated.
12. Bus Driveways:
 - a. School bus loading and unloading areas are provided on the school site.

- b. When loading and unloading of pupils takes place on a main thoroughfare, the roadway has a minimum width of 40 feet of hard surface.
- c. The driveway leading to and from the loading and unloading area for school buses has a minimum width of 30 feet of paved surface.
- d. If diagonal parking is provided for buses in the loading and unloading area, a minimum width of 60 feet of paved surface shall be provided.
- e. The parking area should be of sufficient size to accommodate all buses serving the school.
 - 1) Elementary School: 12 – 15 spaces.
 - 2) Middle School: 20 spaces.
 - 3) High School: 20 spaces.
- f. Backing up of buses shall not be permitted.
- g. Parking for loading and unloading of pupils is bumper-to-bumper or diagonal.
- h. All school bus movement on the school grounds shall be one way in a counterclockwise direction.
- i. School bus traffic shall not completely encircle the school building.
- j. The school bus driver shall have proper sight distance at all points along the driveway.
- k. Crosswalks for students shall not traverse the entrance to the school bus driveway.
- l. Separation shall be maintained between school bus traffic and all other traffic.
- m. Vehicular pickup points for no-buses students shall be located on driveways separate from those used by school buses.
- n. Curbing and suitable drainage shall be provided along driveways.
- o. Curbing and driveway construction shall comply with state highway specifications.
- p. Driveway turns should be laid out for the turning radius of each and shall adequately accommodate maximum-length wheel base for buses and fire trucks.
 - 1) At areas of ingress and egress to and from the school, the minimum radius on the inner edge of the driveway pavement shall be 50 to 100 feet.
 - 2) On the school site provide a minimum radius on inner edge of driveway pavement of 60 feet.
- q. At least a 50 foot tangent section shall be provided between reverse curves.
- r. A maximum grade of 2 percent shall be adhered to at ingress and egress points.
- s. A maximum grade of 5 percent shall be adhered to on the school bus driveway located within the school site.
- t. Provide a clear view for at least 200 feet in both directions from the school loading and unloading zone.
- u. Provide a clear view of at least 200 feet in both directions from the entrances and exits of the site. Use bus parking lots for hard surface play areas.

ENERGY CONSERVATION: Designers shall consider building orientations and configurations that minimize heat loss and facilitate beneficial solar gain during heating season, allow for natural ventilation and promote natural day-lighting of building interior. South facing window surfaces, particularly at large glazed areas, should be protected by horizontal overhangs, which maximize solar heat gain during the heating season and minimize it during the cooling season.

1. Also recommended is the use of deciduous trees for summer sun shading, winter sun penetration and use of conifer trees for summer sun shading and winter wind breaks.
2. Enclosed courtyards often present maintenance problems and should be used with great discretion. If used, provide for maintenance access and do not install large tree plantings. Provide hose bibbs and adequate sized storm drain structures.

RETAINING WALLS: All retaining walls with a height of 4ft. or greater or walls subjected to surcharge loading (i.e., vehicle traffic, loping backfill, or point loads) shall be designed by a professional engineer and drawings shall be signed and sealed accordingly, with railing/guardrail as required by code. A special inspection shall be done as required by International Building Code (IBC) on walls above 4'0".

STORAGE BUILDING: shall be provided as per program requirements. Designers should use finish materials and colors to match adjacent buildings.

EXTERIOR MECHANICAL AREAS: shall be enclosed with security fencing as noted in Section 02 83 00. Provide reinforced concrete slab with fenced area with proper sized pads/curbs for equipment mounting. Slope slab away from building.

BOILER ROOMS: shall have exterior door only with no windows allowed in door.

MAIN MECHANICAL EQUIPMENT ROOMS: shall have exterior doors where possible with no windows allowed in door.

Designer must verify that future additions on new schools, relocatable classrooms and associated parking would be approved based on current codes and zoning restrictions.

Dumpsters and recycling bins shall be located near the kitchen service entrance. These are provided by CCS. This area shall be screened.

Exterior can wash area shall be near dumpsters and covered by canopy.

Division 32 – Exterior Improvements

PAVING

CONCRETE WALKWAYS: shall be minimum of 4 in. thick and 5 ft. wide with a broom finish. Use Fiber Reinforcement and install construction joints at a maximum of 5 ft. on center and expansion joints at a maximum of 30 ft. on center. Use wider walkways at entrances and bus and parent drop off areas.

Finished grade shall be level with sidewalk edge and slope away. Flare out walk surfaces at intersections.

CONCRETE PAVING: shall be made of reinforced concrete and a minimum of 6 in. thick on a compacted sub-grade. Where sidewalks are used for maintenance access they shall be reinforced/thickened to meet vehicular load requirements. Pave in front of dumpster pad locations and service docks for a minimum distance of 16 ft. and minimum thickness of 8 in. with fiber reinforcement.

ASPHALT PAVING: Geo Technical engineer will dictate the pavement design. All work shall be in accordance with the NC Department of Transportation "Standard Specifications for Roads and Structures" and the Asphalt Handbook Manual Series No. 4 (MS-4) 1989 Edition. Compliance to these standards shall be verified with density testing by either core samples or nuclear density gauge at all paved areas, with particular attention given to bus driveways and parking areas. The testing shall be done by the Owner and overseen by the Designer as required for reimbursement by the state. Heavy duty paving shall be used at bus parking and service drives. Standard paving shall be used for parking lots.

All materials, mixes and construction techniques shall comply with Section 1008, Aggregate Base Course for Stabilization, Section 640, Asphalt Concrete Binder Course and Section 645, Asphalt Concrete Surface Course, of the North Carolina Department of Transportation Standard Specifications for Road and Structures (1995). A job mix formula shall be approved by the Engineer of Record prior to the application of the asphalt.

CONCRETE CURB AND GUTTER: shall be integral, one-piece curb and gutter with a broom finish. Height of curb shall be six inches and width of curb and gutter shall be a minimum of 24 in. Install construction joints at a maximum of 5 ft. on center and expansion joints at a maximum of 30 ft. on center. Extruded curb is acceptable however; it shall be properly installed and back-filled. Use of extruded curbs installed on the surface of the roadway is unacceptable.

FIRE DEPARTMENT ACCESS ROADS: shall be gravel with a 4' wide heavy duty asphalt paved area in the middle at High and Middle Schools, and totally paved at Elementary schools. Coordinate location with authorities and with CCS maintenance departments.

ATHLETIC PAVING AND SURFACE

Grading and marking of athletic paving and surfaces shall be in compliance with National Federation High School Association Standards as adopted by the North Carolina High School Athletic Association. Copies of the standards are available by contacting the NCHSAA at 919-962-2345 or PO Box 3216, Chapel Hill, NC 27515.

All construction shall comply with the general specifications provided by the United States Tennis Court and Track Builders Association, Baltimore, MD, unless more stringent requirements are indicated.

TENNIS COURT SURFACING: shall be 2 in. of SF 9.5 A on 6 inches of compacted stone base course.

TRACK SURFACING: 2 inches of asphalt surfacing on 6 inches of compacted stone base course. SBR (styrene-butadiene rubber) rubber particles or EPDM(ethylene-propylene-diene rubber) may be used for the surfacing. Track will be a minimum of 1/2 inch thick. A final compatible surface coat to provide protection from ultraviolet light degradation and to provide additional wear resistance is to be applied. Provide a track at each high school site. If a middle school site is not close to a high school, then it shall have a track area. (Consult Facilities Department for clarification.)

It is recommended that track-surfacing slope 2% towards in-field. This will require installation of curbs and underground drainage systems. Two (2) 4 in. diameter empty conduits shall be provided under track installations for future water and power lines, location to be provided by designer. Swales should be installed to divert water away from these areas.

STRIPING: Paint shall be approved acrylic latex and colors shall be selected by owner.

BASKETBALL COURTS AND HARD SURFACE PLAY AREAS: 4 in. fiber reinforced concrete on compacted sub-grade is acceptable or 1 inch of sand asphalt on 2 inches I-2 asphalt surfacing on 6 inches of compacted stone base course.

INFIELD AND WARNING TRACK: mixture shall be 60% clay silt and 40% sand with surface conditioner applied at 25 tons/"skinned infield." Depth of mixture shall be 6 inches.

No materials shall be placed if the temperature is not at least 50 degrees F and rising.

The track shall be marked and measured by a professional track striper using specifications and guidelines approved by the appropriate governing body (NCAA, IAFF, NFSHA). Certification of track shall be provided upon completion of striping.

FENCING

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 4 ft. wide. Enclosures shall meet local ordinance requirements.

TENNIS COURTS: Shall be enclosed with a 10 ft. high 1 3/4" mesh chain link fence with 4 ft. wide gates.

HIGH SCHOOL BASEBALL AND SOFTBALL FIELDS: shall be enclosed with a 6 ft. high chain link fence with 14 ft. wide service and 4 ft. wide player gates. 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 20 ft. high and the foul ball screen shall be 6 ft. high set at 45 degree angle. 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.

MIDDLE SCHOOL BASEBALL AND SOFTBALL FIELDS: shall be enclosed with a 6 ft. high chain link fence with 14 ft. wide service and 4 ft. wide player gates. A 20 ft. high chain link backstop with a 6 ft. high foul ball screen set at 45 degrees shall be provided at baseball fields. A 10 ft. high chain link backstop with a 5 ft. high foul ball screen set at 45 deg. shall be provided at softball fields.

PRE-K FENCING: 4' 0" high coated fence with gate shall be installed around Pre-K playground areas.

All retention and detention basins will have 6 ft. high chain link fencing with 6ft. access gate for mowers around the perimeter. Bio retention areas will not be fenced.

Install chain link face in accordance with ASTM F 567 and written installation instructions of fencing manufacturer to provide secure, aligned installation.

IRRIGATION SYSTEM

Install metal identification tapes over PVC lines.

Minimum 24 in. cover to top of irrigation piping.

Engineer shall require contractor to dimension actual location of all irrigation lines on as built drawings. A minimum of two (2) dimensions from building reference point shall be provided and a bury depth indicated.

GRASS SEEDING

The Designer shall require the contractor to stage construction so all lawn and athletic field grass seeding occurs early enough to allow grass to develop through one growing season prior to substantial completion. When substantial completion is scheduled for June through December, grass seeding shall occur prior to April 15. It will be the contractor's responsibility to fertilize, irrigate and cut the maturing grass until substantial completion. The areas of lawn and athletic grass seeding along with scheduled seeding date shall be shown on Designer's Landscape Planting Plans.

At renovation/addition projects, the Designer shall require the Contractor to isolate and protect existing lawn areas not involved in the new construction.

Irrigation shall be provided for athletic playing fields.

Areas immediately around the front entrance of the buildings and court-yard areas need to be sodded (Fescue preferred). If lawn grass seeding cannot be done with Fescue due to growing season restraints, a temporary seed mixture of winter rye at a rate of 120 lb/acre can be used but contractor is to be held responsible for returning to site and overseeding with Fescue in the proper planting season, preferably in the fall September 15 through October 30.

Contractor shall be responsible for watering of grass 90 after substantial completion for athletic fields and 60 days after substantial completion for all other areas.

LANDSCAPE PLANTING

Landscape planting offers a cost effective means to enhance overall project appearance, provide privacy at outdoor learning areas and provide summer sun shading and winter wind breaks.

All plants shall be native species and of a hearty, durable variety and requiring minimum watering and maintenance.

Do not use plants with thorns, or toxic foliage, flowers or fruit.

At renovation/addition projects, the Designer shall require the Contractor to isolate and protect existing planting not involved in the new construction. Areas of protection will be shown on the contract documents.

When mulching slope plantings in low visibility, for outlying areas, triple shredded hardwood mulch can be used to keep down costs. Do not use pine straw.

When slopes are in high visibility areas or slopes are greater than 3:1, landscape with trees and/or shrubs and/or a non-mow seeding such as Lespedeza or Love Grass. Slopes of lesser grade can be seeded with fescue (if irrigated) to get them established see Section 32 92 19.

Contractor shall provide tree/shrub protection fence that is out at the drip line of the tree.

STORM DRAINAGE PIPE AND FITTINGS

Reinforced concrete is recommended for all pipes 12 inches and larger located under paving and for all pipes over 12 inches in diameter.

Proper bedding and compaction details for larger diameter pipe shall be included in construction documents.

PVC is recommended for pipes 12 inches in diameter or smaller when not located under paving.

Discharge from all storm drainage piping shall occur in a controlled fashion and in compliance with local jurisdiction storm water guidelines and in accordance with outlet stabilization required by the Sedimentation Pollution Control Act.

Designer shall evaluate the downstream effects and recommend a course of action.