

VALENCIA COLLEGE

ARCHITECTURAL AND ENGINEERING GUIDELINES

April 2023

Prepared by Facilities/Plant Operations/Sustainability

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Since its inception in 1967, Valencia College has had design and construction leaders acutely interested in the function and operation of the institution's facilities. This interest has included the sustainable development of buildings and structures, as well as the campus topography, landscaping and utility infrastructure.

These architectural and engineering guidelines have been developed to ensure the continued quality and high performance of the built environment to provide continuity in product selection and to enhance maintainability. Design consultants and contractors are required to familiarize themselves with this document and to incorporate its provisions into their contract documents or work. In instances where these requirements conflict with design parameters or updated code requirements, discussions with the Owner shall occur to ensure all conflicts are resolved.

These guidelines were established based on past experiences. It is not the intent of the College to restrict the creativity of the designers. Questions or recommendations regarding potential alternatives to this document should be referred to the Facilities Department of Valencia College.

GENERAL

1.0 Design Considerations

- 1.0.1 All areas of the campus should be considered learning environments. Options to integrate campus living laboratory features as resources for faculty/staff and students learning opportunities should be explored.
- 1.0.2 Interior and exterior campus spaces should be designed to promote formal/informal gatherings of students, faculty and staff with access to natural views and resources where possible. Shade and passive cooling should be incorporated into the design when possible.
- 1.0.3 Flexibility in the arrangement and use of a building is a fundamental design requirement. Designs for new buildings and renovations should accommodate a reasonable degree of flexibility for future expansion, growth or change of programs, orientation for efficient cooling, and solar and electric vehicle (EV) readiness.
- 1.0.4 Building designs should have a coherent plan that incorporates wayfinding that provides clear and accurate directions at the appropriate locations. Such systems will be determined per project. Coordination with the College is required.
- 1.0.5 Designers should consider how new buildings will relate to adjacent structures and incorporate appropriate transition areas.
- 1.0.6 Building massing, building profiles and the selection of colors and finish materials should reinforce the campus identity.
- 1.0.7 Designs should promote campus safety and security. Designers should avoid complex building perimeters that create niches where individuals can conceal themselves and places that are difficult to monitor.
- 1.0.8 The designers should follow Green Building Initiative. New buildings will be, at a minimum, two Green Globe Certification. Interior renovation projects may also be required for pursuit of certification, pending direction from the College.
- 1.0.9 Designers shall consider building materials that have garnered Environmental Production Declarations and/or other certifications per the Green Globes current standard. Discussion with the College regarding implementation of these materials will occur during the design process.

- 1.0.10 The ability to accommodate growth and change are important criteria in the design of structural, mechanical and electrical systems and selection of materials.
- 1.0.11 Designers are expected to consider long-term sustainability, durability and maintainability when selecting equipment, materials and finishes for either new facilities or renovations. First cost is not the only consideration. First and life cycle costs, low maintenance, and chemical exposure to students and employees are to be considered in equipment and material selections.
- 1.0.12 Service personnel should be able to access equipment and perform routine maintenance without disruption to campus activities. Designers shall comply with OSHA regulations for access to equipment via stairs, platforms and on rooftops. Equipment clearances must be sufficient to permit replacements throughout the life of the facility. Mechanical equipment rooms should have access to the exterior where possible and convenient service-vehicle access. The designer should consider the needs for service vehicles when providing parking designs for new facilities. In no instance shall the Owner's personnel have to do the following to service any piece of mechanical equipment:
- 1.0.12a Remove a wall/partition or other architectural component to take out or disassemble a piece of equipment.
 - 1.0.12b Disassemble or remove other adjacent machinery, equipment, piping, electrical conduit, etc., to perform normal service.
 - 1.0.12c No conduit, power outlet, etc., shall be installed directly beneath any piece of equipment or machinery that is mounted above the ceiling. It shall not be necessary to disconnect and remove any system components below a piece of equipment to remove and lower it to the floor.
 - 1.0.12d Climb out on, or lie on, piping, conduit, ductwork, etc., to access or service a piece of overhead equipment. This includes HVAC equipment panels, disconnects or fuses.
 - 1.0.12e Lean over conduit, piping, ductwork, etc., to service/access a piece of equipment while standing on a ladder.
- 1.0.13 Designers are required to design facilities that do not rely on custom-built components and shall be of a type that can be maintained using standard stock items that can be readily and inexpensively ordered and shipped. Standard stock items must be used whenever possible. Custom-built fabrications and equipment must be clearly identified in the design documents and approved by the College.

Built-in cabinetry should be used selectively and only when a comparable piece of furniture would not work effectively. Coordination with the Owner is required to determine when to use millwork in lieu of furniture.

- 1.0.14 Special scheduling and construction restraints to protect the safety of campus users, the continuance of the educational programs and to maintain flow of pedestrians and vehicles around construction sites may be imposed during the construction phase of the project. Designers and contractors should also be aware of the presence of students, faculty and staff who require mobility, visual or hearing accommodations. The entire college population shall be protected from injury and exposure and provided adequate warning and accommodations to access all temporary walkways or around stockpiles of materials, excavation, fences and barricades. Designers and contractors should adhere to the no-idling policy while on premises. All areas around the construction site must be maintained in a clean and safe condition. Accommodations for people who have disabilities shall be planned to provide appropriate detours subject to college approval and shall be included in construction documents.
- 1.0.15 Wherever possible the basis of design for the HVAC system should include demand ventilation and bi-polar ionization to reduce outside air requirements as much as possible while maintaining appropriate indoor air quality standards. Indoor air quality should be a consideration in the design of the mechanical systems and construction materials selection. The designers shall schedule time to properly balance the systems and to adequately ventilate noxious products resulting from out-gassing of the building materials prior to occupancy.
- 1.0.16 Asbestos or any asbestos containing material shall not be used under any circumstances. Designers and contractors may be required to sign a statement asserting compliance with this requirement. All materials used in construction shall be certified that they do not contain asbestos.
- 1.0.17 The Owner's room numbering system should be used during design and construction. Any interior signage that is required to be furnished and installed by the Contractor will use the Owner's room numbering system. This numbering system will be part of the Contract Documents and will be present in the Architect's section of the drawings or provided by the College during the construction phase. Coordination of this requirement between the design team and the College should occur as soon as the floor plan has been established. The electrical engineer will ensure that it is clear to the Contractor/Subcontractors that all electrical panel schedules on the drawings reflect and utilize the Owner's room numbering system.
- 1.0.18 The College has a continuing contract for plan review, permitting, and inspection with PDCS:

PDCS, LLC
3361 Rouse Rd., Suite 210
Orlando, FL 32817
407 277-9795

Mark Jones MJones@pdcsllc.com
Dan Weaver DWeaver@pdcsllc.com
Damaris Gonzalez DGonzalez@pdcs.com

The College pays PDCS directly for the building permit, but the contractor should plan to get the permit from PDCS once notification of approval has been received.

1.0.19 The contractor shall provide a complete set of PDF As-Built drawings and specifications to the Owner. All drawings and specifications shall be updated and clearly marked *AS-BUILT*. All sheets shall be labelled to match the construction documents provided by the architect.

The contractor will also provide any additional drawings, photographs, renderings, etc. related to the project in PDF format.

CIVIL/SITEWORK/LANDSCAPING/IRRIGATION

2.0 Earthwork and grades

- 2.0.1 All site clearing, dewatering, erosion control, soils transport and/or stockpile, excavation and backfilling, compaction, soil treatment, rough and finish grading, sodding, landscaping and irrigation shall be the responsibility of the General Contractor. Conservation of nutrient rich topsoil should be separately stockpiled and returned as topsoil onsite upon completion.
- 2.0.2 Maximum finish gradients shall not exceed 4:1.
- 2.0.3 Protection of indicated foliage to remain from surface or subsurface damage shall be the responsibility of the General Contractor. A proposed protection plan shall be submitted to the Owner for approval prior to start of construction.
- 2.0.4 Existing trees should be protected when considering new construction through the use of tree protection zones extending to the drip line of the canopy of a given tree. When trees are removed, the contractor, working with the project manager and in consultation with the Grounds Department, shall include pricing to replace removed trees. Generally, the contractor should expect to replace the total loss of Diameter Breast Height (DBH) of all removed trees by doubling the amount that is removed. It is the desire of the College that this is accomplished by larger sized replacement specimens (as applicable and appropriate within the specific project parameters) versus smaller, more numerous replacement trees. For example, if the project removes a 24" DBH Live Oak Tree, the design will call for a total replacement of 48" of DBH. In most cases, the replacement tree(s) will be of the same species but pending the specific selected replacement site, alternative species may be acceptable if it is believed they perform better. The species selection and installation timing decisions will be left at the discretion of the College. New tree information should be reported, updating the College's tree inventory database as part of the institution's Tree Campus USA designation.
- 2.0.5 When available, information regarding subsurface utilities and structures will be furnished by the Owner and shall be verified by the Contractor prior to excavations. Trenching, back-filing, compaction and surface identification required for verification shall be the responsibility of the Contractor.
- 2.0.6 Contractor shall be responsible for the disposal of all excess soil and site work materials. College dumpsters may not be used by the Contractor(s).

2.0.7 Fill dirt must be clean and similar to native soils. Unacceptable fill dirt includes gumbo clay, hardpan, or soil containing debris, including roots, concrete, or metal.

2.1 Temporary Utilities

Placement and removal of all temporary utilities shall be the responsibility of the Contractor. Water and power may be provided by the College, determined per project.

2.2 Subsurface Drainage and Storm Sewer Systems

2.2.1 The project Civil Engineer shall request and/or coordinate existing subsurface information as necessary to evaluate requirements for subsurface drainage system(s), special foundations, etc., in accordance with the appropriate State Water Management District. The engineer shall coordinate the design with other underground utilities as required.

2.2.2 Design shall assure roof drainage will function adequately during peak storm conditions. Opportunities for rainwater capture and storage for reuse should be explored.

2.3 Asphalt Paving, Concrete Curbing and Sidewalks

2.3.1 Design roadways in accordance with County and FDOT latest specifications (most stringent shall apply). Avoid designing roadways that pass between parking lots and buildings. Opportunities for safe pedestrian and biker access and connectivity should be integrated into the design. When specifying asphalt concrete, aggregate base or Portland cement concrete for road construction projects, recycled, reusable, or reground materials shall be used when practicable.

2.3.2 Coatings on paving materials should be a grey or lighter color to reduce heat gain wherever possible. Solar Reflectance Index values should not exceed the most current version of LEED or Green Globes.

2.3.3 Permeable paving materials should be used wherever appropriate.

2.4 Pedestrian Walkways:

2.4.1 Minimum standards for sidewalks are as follows: 6" thick, 3,000 psi, reinforced concrete. Primary sidewalks connecting high traffic areas shall be a minimum of 12' in width, secondary sidewalks a minimum of 6' in width.

- 2.4.2 Sidewalks which are intended for use by security or delivery vehicles shall be designed to support those loading conditions. Sidewalks shall be level with adjacent grades. If colored concrete is specified, final approval of the color by the College is required.
- 2.4.3 At all locations where sidewalks meet at a perpendicular or near perpendicular angle, the intersection will be connected with large radii, tangential curves or splayed 45° sections at the points of intersection. Joints shall be arranged to avoid internal corners and slab "points."
- 2.4.4 All sidewalk surfaces shall have a light broom, non-slip finish. Brooming shall be perpendicular to the direction of pedestrian traffic.
- 2.4.5 Provide a group of 4" spare conduits where the sidewalk separates two (2) green areas and at intersecting walks. These shall be shown and specified on the Electrical Site Plan. The conduits shall be placed 18" below finished grade or top of sidewalk, shall extend 1'-0" past the edge of the sidewalk (both sides); spaced 1'-0" apart and be capped on both ends. Their exact location shall be recorded on the As-Built Drawings with GPS coordinates, and marked at the edges of the walks with lead inserts stamped with an X.
- 2.4.6 ADA curb ramps shall be provided at all road crossings and parking lots. All sidewalk edges, including control/expansion and construction joints shall be given a tooled ¼" radius edge. Edge tool shall produce picture-frame edge/joints. Provide nonskid surfaces at ramps. Expansion joints shall occur every 40' (max.), be ½" wide and constructed of pre-molded expansion joint material topped with backer rod and finished with colored caulk. Control or construction joints shall be 10' o/c in both directions, ¼" wide and ¼ of the thickness of the sidewalk in depth (i.e., 1½" deep for a 6" thick sidewalk).

2.5 Exterior Benches

Benches, when specified, will be provided at locations designated by the Owner. If concrete, the benches shall be constructed of 3,000 psi concrete with steel reinforcement. Finish shall be smooth and free of stains, honey combing and voids. Style of bench varies per campus and will be designated by the Owner.

2.6 Parking Lots

- 2.6.1 Pedestrian safety shall be the primary consideration in the design of parking facilities and should be designed in consultation with College Security.

- 2.6.2 The circulation pattern from the entry to exit should be logical, intuitive and clearly defined.
- 2.6.3 Vehicular traffic lanes shall be separated from intended pedestrian circulation. Walkways shall be delineated by striping, use of different paving materials or a slight rise in elevation.
- 2.6.4 Landscaping, beyond code minimal, in parking areas to provide shade and separation is encouraged. The chosen plant palette, prioritizing native and Florida-friendly plants, should be durable and based on the specific location. Considerations should be irrigation installation, subsurface materials, parking lot ingress and egress, line of sight issues, available topsoil and similar concepts. Low Impact Development (LID) principles shall be applied and green infrastructure in parking lots for stormwater management is encouraged. The US EPA Office of Water 104b(3) Program provides online resources can be used as a guide (<http://www.lid-stormwater.net/>)
- 2.6.5 Parking Lot striping except for parking spaces shall be applied ThermoPlastic Setfast Water-Borne Traffic Paint. Color coding shall be as follows:
- TRAFFIC YELLOW color shall be used to designate *FACULTY & STAFF* parking
- WHITE color shall be used to identify all stop bars, directional arrows, wording (i.e., *STOP, NO PARKING*, etc.), crosshatching and all parking spaces designated *STUDENT* or *VISITORS*.
- BLUE AND WHITE color shall be used to designate all *ADA/ACCESSIBLE* parking spaces. The wheelchair symbol shall be white. Markings shall be in accordance with the latest ADA specifications.
- GREEN color shall be used to designate all low emitting and fuel-efficient vehicles.
- 2.6.6 For parking lot signage, see Section 10.6.
- 2.7 Potable Water Systems (water mains, control valves, and fire hydrants)**
- 2.7.1 All materials and work shall comply with applicable Federal, State, and County codes; the Florida Department of Environmental Protection and NFPA 24.

2.7.2 A cast iron valve box and cover shall be provided at all below grade water shutoff valves. The valve box shall be continuous from the bonnet of the valve to finish grade. If the valve box occurs in a landscaped area, it shall be provided with a concrete collar that is 18" x 18" x 4" thick. The Contractor shall provide the Owner with properly sized T-Handle wrenches for each type and size of valve installed on the project. Potable boxes shall be blue to differentiate them from red (hot water) and lavender (reclaimed) water systems.

2.8 Sanitary /Storm Sewer Collection Systems

2.8.1 Exterior, at-grade, cleanouts shall be provided in sufficient quantity and at strategic locations so that all portions of these below grade systems can be easily and quickly accessed for both inspection and rodding operations by the Owner.

2.8.2 All at-grade cleanouts shall be flush with the adjacent grade and shall have traffic-rated covers. Where the cleanout occurs in a landscaped area the clean out shall be provided with a concrete collar that is 18" x 18" x 4" thick.

2.8.3 Sanitary lift stations, where required, shall be connected to the emergency backup power system.

2.8.4 Opportunities for stormwater capture and storage for indoor and outdoor reuse should be considered.

2.8.5 Green infrastructure to reduce stormwater runoff is encouraged to decrease pressure on storm sewer collection systems.

2.8.6 Retention ponds and swales minimize storm water runoff from College properties. All new structures are developed in coordination with the permitting process of the St. Johns River Water Management District and/or South Florida Water Management District.

2.9 Marker Tape

2.9.1 All below-grade utilities (i.e., storm, sanitary, potable water, etc.) shall be marked with 6" wide, colored detectable plastic tape bearing the name of the system. Tape shall be installed continuously for the full run of the system and shall be located 1'-0" below finished grade, above the centerline of the piping. Colors shall be per standard system codes.

2.10 Irrigation System

2.10.1 The Architect shall verify the source of irrigation water. West Campus utilizes reclaimed water, East Campus has deep wells, Winter Park Campus utilizes the

City of Winter Park Utilities water (metered separately), Osceola Campus utilizes water from the retention pond, Lake Nona Campus utilizes reclaimed water, and Poinciana Campus utilizes city water. Appropriate color coding shall be used to indicate source. Utility provided reclaimed water will be indicated by lavender pipe.

- 2.10.2 The lowest quality water available is to be used for irrigation and it is to be installed and managed as efficiently as possible.
- 2.10.3 Irrigation of Bahia grass may be avoided in low traffic areas. Coordination with the College is required.
- 2.10.4 The contractor will reduce irrigation after establishment either in frequency and or volume (run time) in conjunction and communication with the Grounds Department and based on those discussions. Period for establishment will vary depending on plant material and soil (typically months for herbaceous plants and shrubs and over a year for trees). Supplemental water may be needed for existing trees in or near the construction site. If irrigation is not available, the contractor will use a water truck or hand water to maintain plant material as needed.
- 2.10.5 The contractor shall provide as-built drawings showing the location of irrigation zones and equipment. GPS coordinates shall be provided for valves.
- 2.10.6 The controller shall be set in compliance with water management district watering restrictions for both establishment and for ongoing maintenance, and be planned to interface with existing campus controllers or be compatible with future central control systems.
- 2.10.7 The irrigation system shall be free from leaks.
- 2.10.8 Consideration should be given to drip, or low volume irrigation, in planters, individual plants, and/or other locations where appropriate. It is the duty of the contractor to ensure that the new irrigation system run times are compatible with the College's activity schedule, particularly since the low volume equipment requires longer run times.
- 2.10.9 Irrigation heads shall be laid out in a manner to ensure adequate head-to-head coverage of all plant material. Head spacing should not exceed 50% of the nozzle throw diameter.
- 2.10.10 Application should occur in correct spray patterns minimizing overspray on impervious surfaces.

- 2.10.11 Irrigation heads should be located between one foot and two feet from structures pending the specific location. Deflectors shall be installed at all locations where the irrigation water contacts a building.
- 2.10.12 All irrigation heads should have check valves.
- 2.10.13 Application rates for all rotors within a zone should be matched. Ensure the nozzle size is appropriate for the area of coverage.
- 2.10.14 Pipes should be sized to prevent velocities greater than five feet per second. The pressure differential between any heads within a zone shall not exceed 10% of the lower pressurized head.
- 2.10.15 All zones should be pressure regulated at the manufacturer's specified pressure for the heads installed within the zone.
- 2.10.16 Variable arc nozzles should only be used to irrigate unevenly designed turf grass that cannot be effectively irrigated with fixed spray nozzles.
- 2.10.17 Irrigation heads for turf areas shall be Water Sense labeled. Hunter PGP or ADJ and, if applicable and appropriate, MP-Rotor heads or equivalent are preferred.
- 2.10.18 In no instance will an irrigation zone provide water to both a shrub/landscaped area and a turf area.
- 2.10.19 Irrigation heads shall be located to ensure that adequate head-to-head coverage of all plant materials occurs. Deflectors shall be installed at all locations where the irrigation water contacts a building.
- 2.10.20 All main lines shall be buried at a depth of not less than 24" below grade. All lateral lines shall be buried at a depth of not less than 18" below grade.
- 2.10.21 New irrigation systems should be designed by a Certified Irrigation Designer or a Florida Water Star Accredited Professional to ensure the most resource efficient design. This AP should make themselves available at the College's design meetings if needed. (<http://floridawaterstar.com/professionals.html>).

2.11 Irrigation Control System

- 2.11.1 Renovated systems on all campuses must be: Hunter Industries ACC or similar controller from Hunter Industries consisting of fully web-based integrated controls. Additionally, all controllers to be 2-wire capable and integrate rain sensors, weather station (as applicable), and flow meters on source water & branch / zone lines with standard lightning protection. The contractor is

expected to work with the Grounds Department to explore the possibility of tying new irrigation zones and lines into existing controllers. Whenever possible, new irrigation system zones shall be tied into existing controllers and operate from a central location.

- 2.11.2 The controllers shall be equipped with a rain shut-off device, as required by law.
- 2.11.3 Control wiring shall be run directly above sprinkler mains or in PVC conduit at walk/road crossings. Warning tape should be installed 12" above wiring. A minimum of two (2) spare wires, plus a ground shall be installed with all required new wiring or the latest design standards for two-wire irrigation. All control wire splices shall occur only in valve boxes using Snap-Tite or equal connectors and sealant. Covers shall be marked "IRRIGATION" or color-coded lavender if reclaimed water is the source.
- 2.11.4 All control valves, gate valves and quick couplers shall be installed in Brooks 37T concrete valve boxes with steel lids or VP10 traffic rated valve boxes and appropriate system marking. All irrigation valves shall be equipped with a global positioning system (GPS).
- 2.11.5 All zone valves shall be manufactured by: Rain Bird, Irritrol or Hunter Irrigation, or as approved by VC for a specific campus.
- 2.11.6 Lightning Protection for Control System (see also Division 16)
 - 2.11.6a The Contractor shall furnish and install all applicable lightning protection devices for the control system and shall assure that the total system is prepared to operate in a lightning intensive environment. This equipment shall include, but is not limited to, an approved 3-wire type primary arrester (such as Intermatic #AG2401) and controller valve output protection on the individual zones if not furnished integrally with the controller circuitry. All manufacturer requirements shall be followed to the letter.
 - 2.11.6b In addition to the ground listed above; the Contractor shall provide at the field 1 controller location, an earth ground having a resistance to the earth of fifteen ohms or less, measured by the controller installer, who shall adequately mark the location with a concrete/brass pedestal at grade.
- 2.11.7 All new irrigation systems should have a flow meter installed at the source point to track and quantify water usage within the same system.
 - 2.11.7a All meters should be tied into the College's existing building automation system ALC or a central irrigation system software for tracking water usage.

2.12 Landscaping

- 2.12.1 **STATEMENT OF INTENT:** Landscape designs should be developed to provide landscaping that should emphasize simplicity, balance and ecological sensitivity. Designs should incorporate plant materials that are water wise, disease, pest and drought tolerant. The use of native plant material to Central Florida and natural plant arrangements is strongly encouraged, whenever possible. Natural landscaping is considered an important component of the design and the designer shall incorporate existing natural landscapes into the design, pending they do not primarily include invasive materials. Landscape and site designs should preserve existing trees to the maximum extent possible. Proposed removal of existing trees shall be thoroughly evaluated before committing to a design strategy. The College encourages the preservation of wildlife habitat and the consideration of wildlife use in plant material selection. Landscape designs shall be based on the long-term cost effectiveness, labor in maintaining and delivering desired quality, and sustainability of the materials selected. Plants which drop noxious fruit or plant parts is discouraged in high traffic areas but possible in other areas on campus. Landscape designs shall be cognizant of the need for a safe and secure environment for campus users. The use of inappropriate plant materials (e.g., poisonous, sharp needled, nuisance or invasive) is discouraged. No plant species listed as a Category I invasive exotic by the Florida Exotic Pest Plant Council (<http://www.fleppc.org>) are allowed. Landscape and pedestrian area lighting shall be incorporated into the landscape design. Down lighting will be used as not to contribute to light pollution.
- 2.12.2 **TURF AREAS:** Use mowed turf only in areas that can be easily mowed. Large expanses of open lawn should be minimized unless the area is a campus green. Turf for open spaces and lawn areas within or adjacent to roadways and parking lots shall be Argentine Bahia sod. Turf for areas immediately around building perimeters, entrances and walkways shall be Argentine Bahia. Turf around building perimeters shall be planted so there is a minimum of one foot between the building face and the edge of the turf. Unless specified by the owner the use of St. Augustine turf is not desired.
- 2.12.3 **FOUNDATION PLANTINGS:** Foundation plantings shall be selected so that at maturity, there is a minimum of one foot between the building face and the plant material space.

- 2.12.4 Plants shall be grouped by similar water requirements, texture, look and function. Plant selection should be based on the principle of, “Right plant, right place.” Plants growing natively in low wet areas will be correctly sited for swales.
- 2.12.5 Plants should be spaced for growth to maturity if aesthetic requirements allow.
- 2.12.6 SOIL REQUIREMENTS: Prior to designing a landscape project the site shall be investigated by the designer and the soils tested to determine the suitability of the existing soils for the plants selected. The designer shall consider the existing soil conditions in the proposed design. Appropriate recommendations for soil amendments or modifications shall be made by the designer.
- 2.12.7 Cypress mulches and mulches containing dyes or arsenic are unacceptable. Locally renewable mulches are acceptable, for example pine bark, pine straw or melaleuca. All mulches shall be a hardwood-based mulch and may commonly be referred to as a Cyprus mulch. Mulch mixes maybe gold or natural colored upon installation, pending the project dimensions and requirements. Specific mulch products will be provided to the designer by the College.
- 2.12.8 QUALITY: All landscaping shall be installed according to professionally accepted planting procedures by qualified persons using the quality and type of materials approved by the Owner’s representative. Green Industries BMP (Florida Friendly Best Management Practices for Protection of Water Resources by Green Industries (<http://fyn.ifas.ufl.edu>) shall be followed in installation. The quality of all plant material shall meet or exceed the “Florida Number One (#1)” rating as defined in Grades and Standards for Nursery Plants by the Florida Department of Agriculture and Consumer Services.
- 2.12.9 Price specifications for plant material shall be separate from irrigation pricing.
- 2.12.10 WARRANTY: The contractor shall be required to warranty the plant and landscape materials for a period of one (1) year from the date of final acceptance. The contractor is also required to provide maintenance specifications for all furnished plant and landscape materials.
- 2.12.11 TREES: The College is a Tree Campus USA institution and therefore must adhere to a set of five standards: (<http://www.arboday.org/programs/treecampususa/standards.cfm>). Details of trees planted including location, species, and size should be submitted to the College in order to maintain an up-to-date campus tree inventory. All trees planted must adhere to the College’s Tree Care Plan.

2.12.12 The College's policy is to protect existing trees when considering new construction. When native trees must be removed, the College will provide the contractor with replacement tree species and approximate caliper loss of the original trees to match new trees. The College will select the locations for the new trees, which may or may not be near the construction site. Replacement trees may be installed within six months after project completion, pending seasonal, environmental and other factors.

2.13 Fencing and Gates

2.13.1 Temporary site fencing shall be provided for safety, traffic control and site boundaries as required by zoning, county or municipal authorities or the College.

2.13.2 Unless otherwise noted, permanent fencing shall be 6' in height. Fabric shall be 9 gage galvanized wire, 2" mesh with 7mil vinyl coating. Steel fence components shall be galvanized with coating to match the fence. Line posts shall be spaced on 8' centers (max). Fence shall have post caps, a top rail, bottom tension wire, pull, end and corner and gate posts (sized per gate opening); set in concrete as required. Fence at hazardous equipment enclosures shall be 6' in height. All hardware shall be galvanized. Gates shall match fencing, hinged or rolling as required and adequately braced. All shall have matching hardware and padlocks.

2.13.3 Where permanent equipment enclosure fencing is adjacent to building it is desirable for fence construction to match the adjacent building construction.

2.13.4 Size enclosures to provide clearance around equipment for servicing and removing/installing components.

2.13.5 If noise from equipment is problematic, sound attenuating material may be required.

2.14 Termite Control (Chemical)

2.14.1 TERMITE CONTROL: Specify appropriate horizontal and vertical application of chemical treatment; gallons/CSF; control at slab penetrations and perimeter, conditions of application, and terms of warranty.

2.14.2 Environmentally preferable termite control measures and treatments shall be considered.

CONCRETE

3.1 Color

Integral colored concrete may be specified for selected surfaces (i.e., building facades, sidewalks, curbs, planters, benches, etc.). The color must be approved by the Architect and Owner. Mock-ups may be required for final approval. The Owner will provide detailed information during the design process for incorporation in the project documents.

3.2 Floor Drains

When floor drains are specified, the structural engineer shall note this condition on the documents and shall specify the degree and the radius (in feet) of the slope which shall be constructed uniformly around the circumference of the drain. This requirement pertains to all floors, except where ceramic tile flooring is installed over a "mud bed." The project architect, structural engineer, mechanical and plumbing engineers shall coordinate this detail throughout the design. There may be some areas where a floor drain is desired, but a sloped floor is not. Clarification with the Owner is required.

3.3 Construction/Control Joints

Construction/control joint locations for slabs on grade shall be shown on the drawings. In no case will a joint or saw cut occur in areas beneath ceramic tile. If required in terrazzo areas, they shall be located directly below finish control joints in the floor and shall extend in straight lines to the extremities of the finish floor. Refer to Division 7 for vapor barriers and water stops.

3.4 Tolerances

Slabs: Level:	¼"/10' all directions (except @ floor drains)
Steps:	Refer to Accessibility Code Standards
Columns/Beams:	ACI Standards

3.5 Testing

Concrete testing shall include routine pours; and special testing as required (ASTM, etc.). Site work (civil) may be included. Coordinate with appropriate requirements in Division 1. The Contractor shall check with the College to verify if a specific testing agency is to be used via a continuing services contract.

3.6 Precast architectural concrete

Panels should be uniform in color. All colors and textures are required to be approved by the College. Connections should be designed to allow for expansion and prevent cracking. Mock-up panels will be required.

3.7 Concrete Reinforcing

Welded wire mesh or fiber reinforcement may be used. Wire mesh should not lay on the bottom of the slab. Rebar should have adequate cover.

3.8 Sustainability

Pervious concrete and fly ash concrete should be considered where available.

Old concrete removed from campus shall be recycled. A copy of the recycling certificate should be provided to the College.

MASONRY

4.1 Concrete Masonry Units

4.1.1 Where exposed Concrete Masonry Unit (CMU) occurs at interior spaces (i.e., stairwells, machine rooms, custodial spaces, etc.), the workmanship and materials shall be equal to that in occupied spaces including painted surfaces.

4.1.2 Bull nose CMU shall be provided at the corners of exposed interior walls in high traffic areas such as corridors. Owner to verify locations.

4.2 Mortar

4.2.1 Mortar containing asbestos shall not be specified by designers or used by contractors or subcontractors.

4.2.2 Tooling of joint and color on new work shall match work on existing buildings on the respective Campus unless otherwise directed by the Owner.

4.3 Quality Assurance

Appropriate ACI and ASTM standards shall apply. Refer to Divisions 1 and 3 for testing, cleanup, scaffolding, etc.

4.4 Mock-ups

Mock-ups and/or test areas may be required before final approval of Owner.

4.5 Brick

Potential brick types are not limited, but the selection should consider the colors and sizes of the *existing* brick on campus. Owner input and approval are required for final selection.

4.6 Stucco

All colors and textures require input and approval by the College.

METALS

5.1 Finishes

5.1.1 Metal fabrications constructed of aluminum shapes and extrusions shall have an anodized finish. Colors shall match the existing palette established for each campus. Final colors require approval by the College. In some instances, a Kynar type finish may be approved for use by the Owner.

5.1.2 Stair nosings: Provide abrasive filled extruded aluminum or brass safety tread nosings with embedded anchors at all concrete stair tread edges. Stair nosings with anchors shall be embedded in the concrete, tops flush with adjacent surfaces, and in accordance with manufacturer's instructions. Nosing and treads must meet ADA Accessibility Standards.

5.2 Steel Stair and Ladder Design

5.2.1 Stairs providing access to penthouses or roof areas from the top floor of a building shall be straight or a ship's ladder (no spiral stairs will be permitted). Stairs may be either conventional, or alternating tread design with side rails. They shall comply with OSHA and ANSI requirements and shall have non-slip treads. Installation shall be in accordance with manufacturer's instructions. Owner to advise if lockable security panels are required in certain locations.

5.2.2 Ladders may be used for elevator pits, access to areas above high ceilings and connecting different roof elevations. Ladders may not be used for access to any space housing serviceable equipment. Ladders must conform to OSHA and building code requirements.

5.2.3 Ladder rungs shall have a nonslip surface specified as follows: a prefabricated finish, or aluminum oxide granules set in an epoxy resin, or treads filled with aluminum oxide grout are acceptable.

5.3 Equipment Supports

5.3.1 Structural steel framing connected to the building structure for the purpose of supporting toilet partitions, moveable walls, equipment of any type, including but not limited to: large TVs, projectors and projection screens, HVAC equipment and piping, small water heaters, etc. must be designed or checked by a structural engineer, including anchorage details to the building structure. Such framing shall be adequately braced against vibrations, sway and torque from doors, etc.

- 5.3.2 All such material shall be shop primed. Installation tolerances shall be: ¼" horiz; ½" vert. Use manufacturer's standard brackets, etc. where practical. Reinforce wall framing as required for such items as wall-mounted TVs, transformers, projection screens, cameras and any special equipment whether required by A/E design or Owner provided equipment.
- 5.3.3 Rooftop equipment supports: steel framing designed for load, wind uplift, and painted with epoxy primer and paint finish system. Coordinate with roofing system, anchoring, flashing, equipment screening, etc.
- 5.3.4 Expansion joint assemblies: standard manufactured items. Owner to verify final color.

WOOD and PLASTICS

All products and finishes that off-gas shall be avoided if possible (for example products and finishes that contain urea-formaldehyde or phenol formaldehyde). Products that contain recycled content are preferred.

6.1 Rough Carpentry

6.1.1 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.

6.1.2 Provide wood blocking within walls at locations of equipment indicated on the construction documents. Contractor shall be required to record as-built location of all blocking on field documents. A partial listing of such items is as follows:

Wall mounted door stops	(where indicated)
White boards	(Rail @ 36" AFF)
Tack boards	(Rail @ 36" AFF)
Wall mounted shelving	(Special purpose only)
Wall mounted pencil sharpeners	(60" AFF, near entrance)
Wall Clock, battery powered	(96" AFF, per plan location)
Wall hung upper cabinetry	
All wall mounted electrical equipment	

6.1.3 Store lumber off the ground and under cover. Vent to prevent condensation.

6.2 Finish Carpentry

6.2.1 The following are Owner requirements and shall be incorporated in the contract documents for all custom cabinets, finish shelving (lamine clad), counters, etc., ***that are not intended for science laboratory function.***

6.2.2 Quality and construction standard; AW I Custom, Section 400 quality. All exterior exposed surfaces shall be clad with plastic laminate: Color shall be selected by the Owner from manufacturer's currently available stock. Acceptable manufacturers are:

Wilsonart
Formica Corp.
Nevamar Corp.

- 6.2.3 Acceptable materials: Plywood panels; PS-1 (AW I Sections 100/200). Countertops shall be ¾" (9 ply) plywood. Tops with sinks shall be plywood, ¾" minimum thickness, with 4" backsplash. Cabinet doors shall be ¾" plywood. Stiles shall be used between all doors. Shelves shall be adjustable. Backs shall be ½" plywood.
- 6.2.4 Hardwood lumber for trim shall be Red Oak, AWA custom grade.
- 6.2.5 All wood in contact with the floor shall be pressure treated.
- 6.2.6 Workroom and utility shelving: 1" x – pine, paint grade w/tight knots, 2" x 4" support/frames @ 36" maximum spacing; with 1" x 4" P.T. toe board. Corner returns shall have shelving or be closed with plywood. Shelving assemblies shall be secured to wall framing and shall be designed for 75 psf loading. Wall brackets are typically not acceptable. Verify with Owner. Shop drawings will be required for all millwork items.
- 6.2.7 Lounge area and conference room countertops shall have 4" high back-splash panels and rim mount sinks with sealer to countertop. At office workrooms, lounges, etc., (and at other spaces as directed by the Owner) the clearance between the base cabinet top and the wall cabinet bottom shall be no less than 18".
- 6.2.8 Cabinet Hardware standards:
- | | |
|----------------------------------|-----------------------------------|
| Hinges: | Grass #2304, Nickel-plated. |
| Drawer slides: | KV, full extension, #1429 |
| Door/Drawer Pulls: | Stanley #4485 US26D |
| Shelf standards inside cabinets: | KV .255 NP, KV .256 NP, recessed. |
| Magnetic Catches: | Stanley #41 US28, or equal. |
- 6.2.9 Cabinet door and drawer locks:
Basis for design: Schlage CL Series with cylinders, strike plates, rosettes and keys.
- 6.2.9.1 All cabinet doors and drawers shall be provided with a lock except at a pair of doors with a common cabinet. In this instance, the left door leaf shall be provided with a concealed spring-loaded manual latch and the right-hand door shall be provided with a lock cylinder.
- 6.2.9.2 Provide four (4) master keys for each biting used and two (2) change keys for each cylinder installed.
- 6.2.9.3 Visual Key Control shall be provided for all locks and keys by stamping the assigned Key Set Symbol on the bow of each key, the exposed face of each cylinder. The Owner will provide the Keying Schedule, if required. A separate key

cabinet shall be provided for cabinets sufficient for total building needs (separate from door hardware).

- 6.2.9.4 Also provide at Substantial completion three (3) copies of a Keying Schedule which lists each Key Set Symbol and the Valencia College Room Number that the KSS occurs in.
- 6.2.10 If millwork mail slots are required (typically mail slots are an Owner provided furniture item), individual slots will be: 6"h x 11"w x 14"d. It shall start at countertop height with the top at 6'-0" AFF maximum.
- 6.2.11 Installation: Contractor shall verify location of all cabinets, blocking, mounting heights, plumbing and electrical equipment and identify possible conflict with other trades, and flooring installations. Prime and back-paint before installing cabinetry. Leveling floors shall be the responsibility of the General Contractor. Do not install until the building is enclosed and the permanent heating and cooling systems are in operation, and residual moisture from plaster, concrete, masonry or terrazzo has dissipated.
- 6.2.12 Forestry Stewardship Council (FSC) certified wood products and companies should be considered and evaluated using the FSC Certified Database: <https://us.fsc.org/fsc-certificate-database.311.htm>

THERMAL / MOISTURE PROTECTION (including Sound Batt Insulation)

If the College determines to utilize the services of a roofing consultant and/or building envelope consultant, all sections pertaining to roofing systems, flashing, roof penetrations, roof deck thermal control, and fascia trim shall be coordinated with the selected consultant through Valencia. Also, items being anchored to the roof must be reviewed by the Consultant. They will be responsible for all roofing inspections, and warranty approvals.

This guideline addresses the Owner's preference in exterior materials, colors, and finishes as well as the design intent of water intrusion prevention for the total building shell. All products and finishes that off-gas shall not be used. For example, products and finishes should be urea-formaldehyde or phenol formaldehyde free.

7.1 Moisture/Damp Proofing

7.1.1 Scuppers

Where scuppers penetrate roof parapets, they shall be constructed of 24-gauge stainless steel and shall be designed to prohibit capillary action of water and extend far enough from the parapet wall that staining will not occur. Scuppers shall not be used for primary discharge.

7.1.2 Parapet

Parapet coping cap material shall be mill finish (or anodized) (0.050 in.) aluminum, or stainless steel. No applied coating/color shall be provided unless approved by the Owner. All roofing metals shall be furnished and installed by the roofing contractor.

7.1.3 Bituminous Dampproofing

Type I: Shall be trowel-applied over foundation surfaces from footing to grade.
Type II: Brush or spray applied to masonry walls for brick or precast veneer.
General: Material to be asbestos free; protective measures and cleanup.

7.1.4 Bentonite Waterproofing

To be used in elevator (or other equipment) pits below grade, on the exterior side of the wall, or as recommended by the manufacturer.

- 7.1.5 Water repellent
- To be used on architectural precast concrete, cast-in-place concrete exposed surfaces, brick or stone veneer.
- 7.1.6 Application and handling
- All materials shall be used in strict accordance with the manufacturer's instructions.
- 7.1.7 Vapor Barrier
- Two layers of heavy-duty polyethylene material, glass-reinforced, bonded into one layer with kraft paper sealing tape 4" wide shall be provided below all slabs on grade, including proper laps and protection at slab openings. Sample submittals are required.
Related Sections: Termite Control and Concrete.
- 7.2 Building Insulation**
- 7.2.1 Thermal
- Batt insulation, faced and unfaced, shall meet all current codes applicable to the project for R-values at all locations indicated on the construction documents.
- Sustainable insulation shall be considered when appropriate. For example: Insulated Concrete Form (ICF), walls that use polystyrene (EPS) foam with reinforced concrete, or Structural Insulated Panels (SIPs).
- 7.2.2 Insulation Boards
- As specified by Roofing Consultant, if applicable.
- Continuous insulation shall be considered to maximize efficiency.
- 7.2.3 Sound Insulation
- Unfaced sound attenuation blankets are required in all walls around a conference room, classroom, office, restroom or other special purpose rooms. Studs, drywall (each side) and insulation shall continue to deck above. Sound batt thickness to match width of wall cavity.
- 7.2.4 Safing Insulation (fire stopping)

Shall be equal to USG Thermo Fiber, min. density - 4 lbs./cu. ft.

7.3 Covered Areas

Protective canopies are mandatory at all primary building entrances. Galvanized sheet metal panel systems are recommended for soffit construction. Gutters and downspouts may be used at covered walkways as long as runoff is directed away from walks or is discharged into underground storm drainage lines or rainwater cisterns. Gutters and downspouts shall be constructed in a manner that allows for cleanout without disassembly.

Walkways with green roofs shall be considered to reduce stormwater runoff, reduce heat island effect, and serve as a student learning tool.

7.4 Skylights

Where daylighting of interior spaces is desired, vertical clerestory glazing is recommended for use in lieu of roof mounted skylights.

7.5 Roofing

In new roof construction, sloped insulation is **not** the preferred method to assure proper drainage. Roof slope should be designed into the structure.

7.5.1 Recommended roofing systems are single-ply, 50 mil or 60 mil PVC with felt backing, or modified bitumen with cap sheet. The design team and Contractor shall review options with the College for each project.

7.5.2 Minimum slope on low slope roofs is ¼" in 12".

7.5.3 Locating equipment on the roof is not preferred. If there is no other alternative and equipment must be installed on the roof, provide walkways designed for that activity to service the equipment.

Solar panels may be an exception to this rule. Designing roofs to be solar ready should be explored at the beginning of the design process on a project-to-project basis to ensure the most cost-effective implementation if the College installs solar arrays.

7.5.4 All roof drains should connect to the storm drainage system or rainwater cistern. Interior gutters shall not be used. Downspouts at high traffic areas shall be protected with heavy duty covers up to 4' above finish grade. Provide cleanout flush with finish grade within 10' of building wall or downspout location at all underground storm drainage lines. Overflow roof drains shall not be designed to empty onto pedestrian walkways.

7.5.5 Roof color shall be chosen to have a high solar reflective index (SRI). For a low sloped roof, SRI should be at least 78. A minimum of 29 should be used for steep sloped roofs. Follow the most current green building standards for the system used (i.e., LEED, Green Globes, etc.). The final roof color requires approval by the College.

7.5.6 Green roofs may be considered and evaluated in new construction projects. A ROI study may be required.

7.6 Exterior Insulating Finishing Systems (EIFS)

EIFS shall not be allowed unless specifically approved by the owner.

DOORS and WINDOWS

8.1 Steel Doors and Frame

- 8.1.1 Hollow steel doors shall only be used at interior locations. For exterior doors see 8.2.1
- 8.1.2 Quality assurance: ANSI/SDI 100. Fire rated assemblies shall be in accordance with all applicable codes, including NFPA 80, and testing per ASTM E 152 with listing and permanent labels by UL and temperature rise rating for exit stairs.
- 8.1.3 Specify delivery, storage and handling requirements.
- 8.1.4 Installation shall require tolerances at head, jamb and floor for proper functioning hardware: A floor shipping spacer is required to remain until door is installed. Coordinate for undercutting per Division 15. Grout jambs at rated walls. Standard height of doors is 7'-0".
- 8.1.5 Acceptable HM door and frame manufacturers:
Ceco Door Products
Republic Builders Products
Steelcraft
Fire Door Corp. of Florida

8.2 Exterior Doors and Frames

- 8.2.1 At all exterior locations where a flush door is required (mechanical/electrical rooms, stair towers, etc.) an FRP or an FRP/aluminum framed, internally insulated door with fiberglass reinforced polyester panels (dimpled surface) shall be provided. Doors shall be equal to: Special Lite Inc., Decatur, Michigan.
- 8.2.2 The color of all finished surfaces of exterior aluminum doors shall typically be architectural dark bronze or clear anodized. Owner to verify per project. Hardware requirements: closer, lockset, weatherstripping.
- 8.2.3 If the door is not a primary entrance and a canopy is not required, then a rain drip is to be installed at door header. Locations to be verified with Owner. Exterior mechanical room doors with louvers shall have insect screening behind louvers.
- 8.2.4 Maximum allowable height for exterior doors shall be 8'-0". The standard shall be 7'-0".

8.3 Flush Wood, Interior Doors

- 8.3.1 All flush wood doors shall be constructed with a staved wood core flush five-ply or as required for fire ratings greater than 20 minutes; factory fitted, and factory finished. AWI Premium Grade. Standard of quality: Marshfield, Signature Series, Select Rift Cut, White Oak, Finish: Honey 26-95. Review and approval of finish sample with Owner is required.
- 8.3.2 All flush wood doors shall be provided with a manufacturer's full, unlimited, lifetime warranty.
- 8.3.3 Architect shall verify wood type/cut of existing buildings at same campus as project (each campus has different veneer requirements). The edge veneer shall match the face veneer. Both leaves shall have matching veneers at double door locations.
- 8.3.4 Veneer shall be clear and without dark spots or streaks.
- 8.3.5 Doors shall be factory finished as selected from Owner submittals.
- 8.3.6 A window (100" min.) shall be specified at all **faculty office** doors. Window shall be clear, tempered glass.
- 8.3.7 Avoid an overlapping metal astragal on pairs of doors except when required by NFPA 80. If an astragal is required, provide hardware to coordinate closing sequence.
- 8.3.8 Specify product protection for shipping, handling and required storage conditions.
- 8.3.9 Forestry Stewardship Council (FSC) certified wood products and companies should be considered and evaluated using the FSC Certified Database: <https://us.fsc.org/fsc-certificate-database.311.htm>

8.4 Access Doors

- 8.4.1 Access panel location shall be closely coordinated with MEP consultants.
- 8.4.2 All access panels at wet locations (restrooms, custodial closets, etc.) shall be constructed of stainless steel. Access panels for water shut-off valves shall be hinged with a latching provision. All screws shall be stainless steel.

8.4.3 Access panels at dry locations shall be constructed of sheet steel with factory applied primer finish (paint to match wall or ceiling color).

8.4.4 Door locking devices shall be screwdriver operated cam locks provided in sufficient quantity to hold the door in a flush smooth plane when closed.

8.5 Exterior Storefronts, Curtain Walls and Windows

8.5.1 Stile width of exterior aluminum doors shall be coordinated with the door hardware to ensure mortise lock, if applicable, is properly housed within the stile.

8.5.2 Color of aluminum members shall be reviewed and coordinated with the College. This shall be an anodized finish (a painted finish is not desired).

8.5.3 All exterior glazing shall be commercially manufactured insulated (double) glass. Types of glass shall be selected by function/location, schedule, and energy conservation attributes. Thermal breaks shall be provided in the framing/glazing system.

8.5.4 At all locations where the bottom plate of storefronts or curtain walls occur at or close to finish grade, extreme care shall be given to the design to ensure that the specified gasket or bedding compound is of the highest quality available and is warranted for the life of the installation. Sills installed less than 4" above ground floor elevation shall have a drain pan below the bottom member. Storefront systems shall be internally drained with appropriate weeps at the pan.

8.5.5 Storefront supplier shall furnish sealed design calculations for the applicable wind code. Provide anchorage details, internal reinforcing as required and select/furnish non-powered overhead closers, sized per door requirement. Power door operators may be supplied separately when coordinated with storefront manufacturer for power and attachment. Maximum height for exterior storefront doors shall be 8'-0".

8.5.6 Door hardware shall be as furnished by the storefront manufacturer except for power door operators and lock cylinders. Doors shall have temporary lock cylinders for construction purposes. These will be changed to permanent cylinders at job completion. Panic hardware shall be per Section 8.7.10 of this document.

8.5.7 Exterior glazing shall comply with all current codes. It should have a U-factor of less than 0.25 and the solar heat gain coefficient should be less than 0.39. If utility rebates are available, the U-factor should be less than 0.6 and a solar heat

gain coefficient (SGHC) of 0.27 or less. Please confirm minimum rebate standards with the applicable utility.

8.6 Interior Glazed Storefronts

- 8.6.1 Stile width of interior aluminum doors shall be coordinated with the door hardware to ensure mortise lock is properly housed within the stile.
- 8.6.2 Interior, borrowed-light, windows may be specified in certain areas in full compliance with wall/frame fire rating and glass safety requirements.
- 8.6.3 All interior glazed openings may be single glazed. Glazing must be sealed to prevent transmission of moisture and dust.
- 8.6.4 Architect shall provide a glazing schedule, which requires Owner approval.

8.7 Finish Hardware

- 8.7.1 Only mortise type locksets shall be used unless otherwise required by SREF (State Requirements for Educational Facilities). Typical manufacturers are Corbin-Russwin, Sargent and Yale. Mortise locksets shall be provided with SFIC housing to match lockset manufacturer.
- 8.7.2 Color and finish of door hardware shall be compatible with the most recent installation on the same campus. Color and finish of door hardware shall be selected by the architect and approved by the Owner.
- 8.7.3 All door closers shall be mounted on the interior side of all doors. Typical manufacturers are Von Duprin and LCN.
- 8.7.4 Automatic openers shall be installed to comply with current accessibility codes. They can also be installed on high use doors such as bathroom doors. Exact locations to be discussed with the College. Typical manufacturer is Horton Industries.
- 8.7.5 Specify 8" high metal kick plates at all restrooms, custodial closets, storage rooms, mechanical/equipment rooms, electrical rooms, laboratories and exits. Color/finish shall match hardware.
- 8.7.5 All locksets shall be ADA compliant with lever operating trim lever style to match campus standard (with knurling on the lever handle at all required locations). The existing trim at the Osceola Campus is Corbin Russwin, Lustra.

- 8.7.6 All hinges shall be heavy duty ball bearing loaded type. Provide stainless steel, nonremovable pins at all locations where hinges are exposed at the outside or exterior side of the door. Continuous hinges may be requested in certain locations.
- 8.7.7 All panic devices shall utilize a cylinder and key (keyed to match the exterior cylinder) to operate the “dogging feature” of the device. The use of Allen wrenches or other tools to activate the dogging feature of the hardware provided at the door will not be approved by the Owner. Typical manufacturers are Von Duprin and LCN.
- 8.7.8 Sound seals should be provided for classrooms, laboratories and conference rooms.

8.8 Keying

- 8.8.1 Owner will furnish a keying schedule.
- 8.8.2 All cylinder locks shall be Great Grand Master Keyed, Grand Master Keyed, Master Keyed, Keyed Alike or different as directed by the College, to the existing Great-Grand Master Keyed System at each campus.
- 8.8.3 Contractor shall furnish and install locksets complete with their properly keyed cylinders or interchangeable cores. Cylinders or interchangeable cores shall be set at the factory into special restricted keyway system for Valencia College with a construction master key. The cylinders should have seven pins as manufactured by Medeco.
- 8.8.4 Proximity Key Systems
Hardware applications will support the access cards and the current keyway applications. All new construction shall supply cable and raceway to facilitate access control, through keyless entry. Door jams and appropriate hinges shall be of the pre-drilled type and capable of accepting wiring for the installation of swipe card readers. HID proximity cards or equal shall be provided for entry ways and in areas where security is critical. Exterior door applications shall support all aspects of life safety and be capable of default setting in the event of power loss or emergencies. ADA accessibility will be achieved by installing the card reader adjacent to the push button. All card reader access doors shall provide a backup override keyed cylinder, or IC core, per Valencia College standards. Doors without card readers entering the same secured space shall also have the backup override keyed cylinder, or IC core.
- 8.8.5 For electronic locks on smart classrooms and exterior doors the College has a continuing contract with an access control integrator:

Signature Systems of Florida
150 Wilshire Blvd.
Casselberry, FL 32707
407 644-8990

It is preferred that electronic mortise locks be provided and installed by Signature Systems, not the door hardware contractor.

- 8.8.6 Furnish the following keys:
Four (4) change keys per cylinder with locksets.
One hundred (100) blanks per keyway.
Two (2) cut Grand Master Keys.
Ten (10) cut Master Keys.
- 8.8.7 On the bow of every key, including cut keys and blanks, the following wording will be mechanically factory stamped, *DO NOT DUPLICATE*, and the key set numbered.
- 8.8.8 Visual key control will be provided by machine stamping at the factory (not locally or in the field) on the bow of the key and the back of the cylinder, or IC core.
Change keys: Factory stamp the key set number or registry, as designated by the campus system, on the bow.
All levels of master keys: machine stamp the registry number on the bow.
All cylinders: machine stamp the key set number on the back of the cylinder, or interchangeable core.
- 8.8.9 Supplier of door hardware shall furnish locksets complete with required cylinder housing and SFIC set to restricted special keyway. All blanks, cut keys and SFIC, shall be made available to Valencia College Facilities, through regular authorized factory distributors and with a letter of approval from the College.
- 8.8.10 All locksets and cylinders furnished under this contract shall be construction keyed or contractor supplied temporary IC cores.
- 8.8.11 At substantial completion, the hardware supplier shall provide a factory prepared and certified Key Bitting Schedule to the Owner. It will show the architect's door number, change bitting number, and the key set symbol for each cylinder provided and all special features of the system (pass keys, etc.).
- 8.8.12 The manufacturer of the system shall coordinate with the College to set up original keying and all subsequent keying, keeping proper records and providing for future maximum extension of the system.

8.8.13 Key cabinet: provide a key control two tag system, including envelopes, label tags with self-locking key clips, receipt forms, three-way visible card index, temporary markers and standard metal cabinet. Provide all material from one manufacturer and per that manufacturer's system. Standard basis of design is Lund Manufacturing Deluxe wall cabinets.

Provide system with the capacity for 150% of cylinders and locksets required for the project.

8.9 Key Delivery and Key System Hardware Inspection

8.9.1 In no instance will the hardware supplier convey, transmit or deliver any of the cut keys or key blanks to anyone other than the Owner.

8.9.2 At, or directly after substantial completion, the hardware supplier will meet with the Owner on-site to coordinate and inspect the proper operation of all hardware of each door. Keys shall be sent to the College with the cores before installation.

8.9.3 Each set of keys and SFIC for each lock shall be packaged in a box, which states the following information:
Architect's door number
Architect's room number
Valencia College's room number
Key set symbol
Registry number (master level keys) or bitting number (change keys)
Quantity of keys in the box

8.9.4 As each door is verified, all levels of keying for that cylinder shall be physically tested for proper operation by both persons. A list of all deficiencies found will be recorded and shall be made a part of the substantial completion punch list for the project.

WALLS and FINISHES

9.1 Interior Wall/Partition Construction

9.1.1 All walls and partitions shall extend to the structure above and shall be designed for total height with bracing as required and fire-stopping at ceilings per code. Anchorage shall be designed at the structure above to achieve sound stop without transmitting building loads through anchors. Double studs shall be required at door jambs. Walls at mechanical and electrical rooms shall have curbs or other permanent water barrier at perimeter walls. Conduits, piping and equipment shall be mounted on back boards or Unistrut brackets.

9.1.2 All partition types shall be identified on the construction documents, with UL/fire ratings and descriptions. Walls shall have 16" offset gypsum board joints. Show all required smoke compartments, smoke walls, fire-rated walls, stair and exit information; and all materials with ratings, etc., to comply with applicable codes and obtain building permits. Fire-rated walls shall be marked above the ceiling at no more than 10' intervals.

9.1.3 All walls at offices, classrooms, labs, multi-purpose and conference rooms shall be filled with acoustical insulation from finish floor to the structure above. At all perimeter edges of a wall (top, bottom, ends and at intersections of walls), acoustical sealant/caulk shall be installed. Floor track shall be bedded in two (2) beads of acoustic sealant at all corridors and equipment rooms.

9.2 Walls and Miscellaneous Finishes

9.2.1 Paint

All new construction, renovation, and/or repair projects shall use latex, water-based paints with no, or low, VOCs, such that they comply with the prescribed limits in the most current Green Building Initiative standard. Painting and drying should only occur when the area of the building is unoccupied and properly ventilated. Notifications to inform all affected staff and students shall be given no less than 48 hours before a painting job begins.

9.2.1.1 The Owner's base paint manufacturer is Sherwin Williams. The standard colors are:

Alabaster SW7008
Alpaca SW7022
Artichoke SW6179
Bagel SW6114

Comfort Gray SW6205
Compatible Cream SW6387
Connected Gray SW6165
Fawn Brindle SW7640
Folksy Gold SW6360
Granite Peak SW6250
Griffin SW7026
Harmonic Tan SW6136
Independent Gold SW6401
Interactive Cream SW6113
Leisure Blue SW6515
Lucent Yellow SW6400
Macadamia SW6142
Meditative SW6227
Sunrise SW6668
Tony Taupe SW7038

Valencia College Branding Colors

Red: Pantone PMS 1805C
Gold: Pantone PMS 130C

Other colors may be introduced per project for review by the Owner.

9.2.1.2 **Typical paint applications:**

Gypsum Walls-Classrooms and Offices

First Coat: Preprite 200 Latex Primer B28W200
Second Coat: Pro Mar 200 0 VOC Eggshell B20W2651
Third Coat: Same as Second

Gypsum Walls-Common Area

First Coat: Preprite 200 Latex Primer B28W200
Second Coat: Pro Mar 200 0 VOC Semi-Gloss B31W2651
Third Coat: Pro Mar 200 Same as Second

Gypsum-Toilet Rooms and Cafeteria Walls

First Coat: Preprite 200 Latex Primer B28W200
Second Coat: Pro Industrial Pre-Catalyzed WB Epoxy K45 Series Egg Shell or K46 Series Semi-Gloss
Third Coat: Same as Second

Interior Concrete Masonry Unit Walls-Common Areas

First Coat: Preprite Int/Ext Blockfiller B25W25

Second Coat: Pro Industrial Pre-Catalyzed WB Epoxy K45 Series Egg Shell or K46 Series Semi-Gloss

Interior Hollow Metal Door Frames (shall be painted the color Alabaster SW7008).

First Coat: Prosys Universal Metal Primer B66W310 Series

Second Coat: Proclassic Alkyd Semi-Gloss B34W51 Series

Third Coat: Same as Second

Interior Wooden Doors

First Coat: Wood Classics Oil Stain

Second Coat: Wood Classics Polyurethane Satin or Gloss

Third Coat: Same as second

Interior Galvanized Miscellaneous Metals (Includes aluminum substrates)

First Coat: Prosys Universal Metal Primer B66W310 Series

Second Coat: DTM Acrylic Simi Gloss B66 series

Interior Miscellaneous Ferrous Metals

First Coat: Kem Kromik Universal Metal Primer B50WZ series

Second Coat: Industrial Enamel Alkyd Gloss B54 series

Exterior Stucco

First Coat: Loxon Guide Coat White A24W100

Second Coat: Loxon Acrylic Top Coat A24W351

Exterior Metal Handrails

First Coat: Kem Kromik Universal Metal Primer B50WZ series

Second Coat: Industrial Enamel Alkyd Gloss B54 series

9.2.2 **Vinyl Wall Covering**

Special locations only, identified and selected by the Owner.

9.2.3 **Ceramic Wall Tile** (See Section 9.3.3 for Ceramic Floor Tile)

9.2.3.1 Ceramic wall tile can be specified for restroom walls and drinking fountain alcoves. Tile should extend to ceiling on selected walls. Other hard finishes can be proposed for review by the College.

- 9.2.3.2 Tile shall be provided with a full selection of all trim shapes required for proper installation (inside and outside corners, cove base, inside and outside cove base corners). All special shapes will match the color of adjacent tile.
- 9.2.3.3 Tile shall be cushioned edge, thinset with inside/outside corner and cove base.
- 9.2.3.4 Contractor shall provide the following attic stock to the Owner, at or before substantial completion. One sealed carton of wall tile and twelve pieces of each of the following: inside corners, outside corners, and caps. These shall be boxed with contents labeled. See Section 9.3.3 of this document for further details.

9.3 Floor Finishes

9.3.1 Epoxy Terrazzo

- 9.3.1.1 Can be considered for use in lobbies, rotundas, monumental stairs and other locations of high traffic.
- 9.3.1.2 Bases to be precast coved, and stair treads to have inset abrasive strips. The terrazzo shall be finished, the entire surface grouted and refinished.
- 9.3.1.3 Architect and Owner will determine pattern, colors and location of control joints and zinc divider strips during the design phase of the contract documents.
- 9.3.1.4 Joints must occur directly over slab joints below.

9.3.2 Carpet

- 9.3.2.1 Shall be specified for classrooms, offices, conference rooms, computer labs and other areas determined by the College. The College standard is a TractionBack product by Milliken, requiring no adhesion. One row of carpet tiles may be glued around the room's perimeter, pending the size of the room. Any glue-down areas must be pre-approved by the College before installation.

Standard styles are:

Scattergraph (typically for classrooms), Color Field (large open assembly areas), Journal (offices and office suites). All other styles and patterns can be proposed for review by the Owner.

Other carpet manufacturers can be proposed for Owner's review.

Provide five percent (5%) of each pattern/color for attic stock.

Use rolled 4" coved, black rubber base at all locations of carpet. If the project is a renovation, coordination with the College is required to determine the color.

9.3.3 Ceramic Floor Tile

9.3.3.1 Can be provided in areas approved by the College.

9.3.3.2 Refer to Division 3 for floor preparation and slopes at drains.

9.3.3.3 Floor grout shall be epoxy. No white grout is allowed. The grout should be sealed.

9.3.4 Linoleum

9.3.4.1 Basis of Design: Forbo Linoleum, Inc.

9.3.5 Luxury Vinyl Tile (LVT)

9.3.5.1 Manufacturers, colors, sizes and patterns require approval of the College.

9.3.6 Resinous Epoxy Floor Coatings

9.3.6.1 Epoxy floor coating systems (not paint) with an integral, four-inch-high base ***are preferred in restrooms, mechanical rooms, custodial rooms and science labs.*** Other rooms may be identified per project.

9.3.6.2 Colors and textures require approval by the College. Samples are required.

9.3.7 Concrete

9.3.7.1 Stained, painted, or sealed, concrete can be provided per the College's approval. Paint should be chemical, impact and abrasion resistance. Use Sherwin Williams Armorseal 1000 HS or equal.

Sealed concrete shall be allowed for areas specifically approved by the Owner.

9.3.7.2 Colored concrete may be used where appropriate. College approval is required.

9.4 Acoustical Ceilings

9.4.1 Standard specification:

Size	2' x 2' x 3/4" or 2' x 4' x 3/4"
Edge	Tegular
Mfgr.	USG Interiors, Inc.
Style	Eclipse with ClimaPlus Performance

Clean room applications (kitchens, food-prep areas):

Size	2' x 2' x 5/8" or 2' x 4' x 5/8"
Edge	Tegular
Mfgr.	USG Interiors, Inc.
Style	ClimaPlus Clean Room

Other manufacturers and styles can be considered; College approval is required.

9.4.2 When it is necessary to field cut tegular edged tile, the field cut will also be a tegular edge so that the tile is supported on the grid member edge and will not sag. Field cut edges shall face the nearest wall.

SPECIALTIES

10.1 Visual Display Boards

All visual display boards will be installed level with concealed mechanical fasteners at the corners. The use of mastics/adhesives will not be permitted. Marker boards shall be installed at a sill height of 3'-0" AFF and be 5'-0" high. Tackboards as noted.

10.1.1 Walltalker / Marker boards

10.1.1.1 There are two standard options for **writable and projection** wallcoverings: Walltalker by Koroseal and Claridge LCD Deluxe Porcelain Whiteboards.

Walltalker by Koroseal

Model Matte-Rite MP60, a 5'-0" wide rolled-on wall covering. It is used across the entire presentation wall of each classroom and additional walls as determined per project. Install from 3'-0" AFF to 8'-0" AFF in the locations indicated on the construction documents.

Walltalker might require an aluminum border in areas to prevent writing on walls, or marker remains spreading onto the wall. If the Walltalker stops short of a corner, or ends on an outside corner, an aluminum edge may be necessary. Owner to confirm.

A continuous, aluminum marker tray shall be installed at each location of Walltalker.

The drywall finish shall be Level 5 wherever Walltalker is installed.

Claridge LCD Deluxe Porcelain Whiteboards

Size and locations to be discussed with the College.

10.1.1.2 Marker boards (no projection capabilities) shall be joined by use of a steel concealed spline which will assure perfect alignment and hairline joints. Marker boards shall be installed with mechanical fasteners only. Glue shall not be used. Marker boards shall be constructed of 24-gauge steel sheet with a virtuous porcelain enamel writing surface. A fifty-year warranty shall be provided. The core material shall be 7/16" thick with a .015" aluminum backer sheet. A chalk rail with cast aluminum caps shall be included.

Marker boards must be proven to be easy to clean, leaving no ghosting. Owner review and approval is required.

10.1.1.3 When requested by the College, existing marker boards shall be resurfaced with EverWhite Glenroy, Inc. (800) 824-1482, www.everproducts.com or with Speakeasy Dry Erase Wallcovering (877) 812-9601, www.speakeasydryerase.com.

10.1.1.4 Tack boards

Tack boards shall be constructed of ¼" thick natural cork, ¼" hardboard with .015" aluminum backer sheet. Edges will be finished with mitered aluminum trim.

10.2 Phenolic Toilet Partitions

10.2.1 The toilet compartments in group toilets shall be constructed from High Density Polyethylene (HDPE) or Poly-Mar HD or Poly-Granit HD virgin resin materials in colors that extend throughout the surface, the panels, doors and pilasters shall have combined recycled and/or virgin material (HDPE). Panels shall be 1" thick and all edges machined to a radius of .250" and all exposed surfaces to be free of saw marks throughout the material. Product shall be resistant to rust, mildew, graffiti, dent and crack resistant and chemical and corrosion resistant with water vapor impermeability.

Ceiling hung partitions are preferred. If there is an offset in the partition the corner may include a section extended to the floor for stability. Color to be coordinated with the College.

10.2.2 Manufacturer to supply a written warranty covering all plastic components and plastic hardware against breakage, free from manufacturing defects in workmanship or material, corrosion and delamination for a period of 15 years.

10.2.3 Wall hung urinal screens should be provided with continuous wall angles on both sides supported by blocking in the wall. Screens should be 18" deep.

10.3 Clocks

10.3.1 Clocks shall be Primex Wireless Inc., Traditional Analog Series with a Synchronous Network System and 1-year life heavy duty battery Catalog #14155. Trim shall be black, and the face shall be white.

10.3.2 Install clocks in all classrooms, laboratories, and all other spaces occupied by students, including the main lobby or rotunda of a building. Clocks may also be installed in other spaces as directed by the Owner during the design process.

10.3.3 **Mounting Heights and Locations**
In classrooms, mount clock on the center line of the wall at 8'-0" AFF so that it is visible to both the instructor and the students. Coordinate location with AV systems so the clock is not placed within the projection area on the wall. At all other locations other than classrooms, the mounting height shall be 8'-0" AFF and at the location designated by the Owner.

10.4 Pencil Sharpener

Provide Stanley Bostich Manual Pencil Sharpener in each classroom with blocking in the wall. Locations to be verified during design.

10.5 Access Flooring

Access floors shall be All Steel 1000 as manufactured by Tate Access Floors or equal. The access floor shall be constructed of 24" square panels capable of supporting a concentrated load of 1000 pounds. Panel lifting devices, spare panels and perforated floor panels for air distribution shall be included.

10.6 Exterior Signage

10.6.1 The College has strict signage design, fabrication and installation requirements to ensure that College branding is maintained. Coordination with the Owner is mandatory if exterior signs are required for a project.

10.6.2 Electrical lighting, when used, shall include photocell controls.

10.6.3 All exterior sign locations shall be coordinated with the landscaping and site utility plans for any obstructions. All exterior post and paneled signs shall have a minimum clearance of 24" from finish grade to bottom of panels.

10.6.5 Parking lot signs shall be provided by the College.

10.7 Interior Signage

10.7.1 Signage for new buildings and interior renovations must be carefully coordinated with the College. All signs will adhere to the College's current standards for design, fabrication and installation to ensure that College branding is maintained. Renovation projects require coordination with Facilities to determine if new signs will match existing signs in the building or follow the new standard.

10.7.2 The College will assign room numbers and coordinate with the architect so construction documents reflect the assigned room numbers desired. The College will provide design specifications and sign locations.

10.7.3 Supplemental signs shall be coordinated with the College to establish a uniform appearance with the room signs.

10.8 Lockers

10.8.1 Lockers shall be constructed of plastic or metal, lockable and vented and incorporate a numbering system feature. Color of lockers is to be coordinated with the College.

10.8.2 Acceptable manufacturers are Lenox Locker Company, Dunmore, Pennsylvania or approved equal.

10.8.3 Pedestals and/or bases for the lockers to be designed by the architect, per location and usage.

10.9 Folding Panel Partitions

Folding, or movable, partitions are not preferred by the College. They should be avoided in all classroom applications. If needed for large assembly areas the following standards apply.

10.9.1 Manufacturer and type will be determined per project. Sizes, writable surfaces, acoustical ratings, etc. vary with each application. Design team is to recommend selection for the College's review and approval.

10.9.2 The wall above the folding partition will include acoustical insulation, full height, that has the same sound transmission rating as the partition assembly (min).

10.9.3 Provide the College with two (2) operating wrenches for each individual room partition system that is installed.

10.9.4 Coordinate panel face color with the College during the design phase.

10.10 Fire Protection Specialties

10.10.1 In all occupied or finished spaces fire extinguisher cabinets shall be fully recessed, or semi-recessed where necessary. Cabinet front and frame shall be a clear anodized aluminum finish, mounted at accessible code-complying height.

Extinguisher type, size and spacing shall be designed to meet or exceed requirements of NFPA 101 and NFPA 10. Maintain wall fire rating behind cabinet.

10.10.2 Fire extinguishers may be surfaced mounted in all custodial spaces, mechanical rooms and storage rooms.

10.11 Toilet Room Accessories

10.11.1 Toilet Tissue Dispenser

Bay West Model 803 Silhouette Revolution Black Transparent (supplied by the College, installed by contractor).

10.11.2 Soap Dispenser

10.11.2.1 Manufacturer of dispenser and soap specification will be verified during design. Material will be supplied by the College, installed by the contractor.

10.11.2.2 Unit to be secured to wall above lavatory with two screws. Exact location is to be specified by Owner at the time of installation.

10.11.2.3 Coordinate the location of this dispenser so that no conflict occurs at either the wall mounted mirror above the lavatory or the water faucet assembly.

10.12 Paper Trash Receptacle

10.12.1 Typically, the trash receptacle is part of the paper towel dispenser unit. Coordination with the College is required before specifying.

10.12.2.1 Mount so that the operating level complies with current ADA codes.

10.12.2.2 Contractor shall furnish the Owner a warranty for these units equal to manufacturer's benefits and terms.

10.12.3 Paper Towel Dispensing Units

The College will clarify which locations are to use hand dryers and paper towel dispensers.

10.12.3.1 Manufacturer of dispenser and paper towels will be verified during design.

10.12.4 Sanitary Napkin Disposal Unit

10.12.4.1 A dispensing unit is not required. Product is provided in a basket on the counter.

10.12.5 **Grab Bars** shall be Bobrick, Model No. B-6206.99 (satin finish/peened). Or equal.

10.12.6 **Mirrors** shall be Bobrick, Model No. B-290 with concealed wall hanger assembly. Or equal.

10.12.7 **Mop holders** shall be Bobrick, Model No. B-223, stainless steel, 48" long. Or equal. Provide one (1) at each custodial sink. Mount at 60" AFF.

10.12.8 One **baby changing station** shall be provided in one men's and one women's restroom per building. A Koala Kare Model KB100 is preferred.

10.13 Corner Guards

10.13.1 Provide corner guard protection at all outside wall corners in public areas of the building (hallways, corridors, exposed free standing columns, etc.). Coordinate exact locations with Owner.

10.13.2 Corner guards will be installed directly above the wall base material and extend up the wall to 52" AFF.

10.13.3 Color of corner guard shall match the wall color (field painting required in most cases) to which it is installed.

10.13.4 Vinyl/plastic corner guard 3" x 3" x 48" (.040" min. thickness), Model 3348 as manufactured by IPC Protection Systems, Muskego, Wis. or approved equal. Submittal is required. Color to be approved by Owner.

10.13.5 Mounting adhesive use only as supplied or recommended by manufacturer.

10.13.6 Contractor shall warranty installation of corner guards for a period of one year, including adhesive and any required repairs to wall surface necessitated due to replacement or repair of this product.

EQUIPMENT

11.1 Theft Protection System (where required by Owner)

- 11.1.1 Library systems shall utilize a micro-magnetic system to prevent unauthorized removal of books, periodicals and A/V materials.
- 11.1.2 Electrical power for this system shall be provided from the building's Emergency Power Electrical System.
- 11.1.3 Provide the following accessories with the system:
 - 11.1.3.1 Desktop desensitizer
 - 11.1.3.2 Electric sensitizer
 - 11.1.3.3 Hand stamp
 - 11.1.3.4 Video cassette strips /1,000 ea.
 - 11.1.3.5 4" double-sided strips/1,000 ea.
- 11.1.4 The power/electronics control cabinet for each installation location will be mounted above the ceiling system and the audible horn component will be flush mounted on the ceiling tile directly above the monitoring panels.
- 11.1.5 Theft Detection System for special equipment, projectors, etc. may also be required.

11.2 Projection Screens:

Manual operated screens are the College standard in rooms utilizing projection screens. Classrooms and other rooms may use a Walltalker, or other wall applications, which accommodates projection, as well as a writable surface.

- 11.2.1 Screen fabric shall be tear resistant, flame resistant, and mildew resistant. Bottom edge will be laterally reinforced for added strength.
- 11.2.2 The projection screen shall be designed for ceiling mounting only, supported by the structure above. Do not mount on ceiling suspension system. Operation shall be spring roller type action. The bottom edge of the screen shall be provided with a rust-proofed steel dowel, hemmed and double stitched around the dowel.

Provide pull-down cord at locations where the bottom edge of the screen bail is 7'-0" or greater above finished floor.

11.2.3 Size of screens will be determined by room size and function.

11.2.4 Manufacturer:
Draper, Da-Lite, or others approved by the College.

11.3 Laboratory Equipment:

11.3.1 Science Laboratory equipment shall be equal to that manufactured by:

Keewanee Scientific (East, West Campuses)
P.O. Box 5400
Statesville, North Carolina

Collegedale Casework, Inc. (Osceola Campus)
P.O. Box 810
Collegedale, TN 37315

11.3.2 Special equipment requirements or control rooms, special flooring systems and lighting controls will require coordination with the College.

11.4 Special Equipment

11.4.1 Bicycle Storage

Installation of bike racks should be considered, installed within 200 feet from a building entrance. The College intends to provide long-term bicycle storage (i.e., covered or placed in a location to shield from rain) for a minimum of 5% of all regular building occupants, but no fewer than four storage spaces per building. The bicycle storage shall be a galvanized steel inverted U. Bicycle racks made from recycled or low impact materials are preferable

FURNISHINGS

Furnishings manufactured with recycled or bio-based content are preferred.

12.1 Aluminum Window Blinds

12.1.1 Aluminum window blinds are not allowed unless specifically approved by the College for a renovation project. All new buildings will use fabric shades.

12.2 Fabric Window Shades

12.2.1 Window shades basis of design:

Phifer SheerWeave, manual roller shade with fascia and metal bead chain control.

Percentage of openness: 3%. Complete blackout shades may be necessary in locations identified by the College.

Typical colors are Tobacco and Pebblestone. White colored shades on exterior windows are not allowed. Coordinate final selection with the College.

12.2.2 Materials with low or no chemicals shall be considered. Biobased or other renewable materials such as bamboo and hemp shall be considered.

12.3 Evacuation Chairs

12.3.1 Design shall identify a location for wall mounting an EVAC Chair in a custodial closet on upper floors and provide red *EVAC CHAIR* sign on door. The College will provide the chair, contractor to install.

12.4 Recycling and Trash

12.4.1 The College prefers corridor alcoves to house the recycling and trash containers on each floor. Design team to verify container manufacturer and size required with the College.

12.5 AED

12.5.1 An automatic electronic defibrillator should be provided.

SPECIAL CONSTRUCTION

This division is reserved for Special Construction.

ELEVATORS

14.1 Basis of Design

Kone EcoSpace or other manufacturers approved during design by the College.

14.2 Quantity and Cab Dimensions

A minimum of **two** elevators shall be provided for every multi-story building. One of the cabs must have minimum dimensions of 7'-6" W x 5'-5" DP x 8'-0" H.

Other cabs shall be 6'-8" W x 5'-5" DP x 8'-0" H.

Cab doors shall be center opening type (two leafs) with a minimum clear opening of 4'-0" wide. Weight and size of equipment such as man-lifts and emergency medical equipment should be considered.

14.3 Elevator Finishes

143.1 Flooring shall be flexible enough so as not to crack under normal conditions. LVT is preferred.

14.3.2 Rear wall and side walls shall be covered with HP plastic laminate. Owner will select from elevator manufacturer's standard colors.

14.3.3 Front wall and return control panel shall be standard brushed stainless steel.

14.3.4 Car doors/hoistway doors shall be standard brushed stainless steel.

14.3.5 Special Features:

Braille and handicapped features

Safety edge and photo-eyes

Recessed telephone cabinet with associated telephone conduit/wiring

Firefighter's emergency service

Pit ladder [OSHA Code; by General Contractor]

Sill support angles as required by manufacturer.

Independent service

One complete set of full length, elevator cargo pads and associated pad hooks. Deliver to Owner in original cartons.

2" (wide face) stainless steel, No. 4 finish handrails on three walls.

14.4 Keys/Security Devices

14.4.1 The College requires four hoistway door unlocking devices/keys for each elevator car.

14.4.2 The College requires four keys for each lock cylinder installed within the car and at the lobby wall mounted call button stations.

14.4.3 The College requires four reset keys for elevator equipment.

14.5 Hoistway

Rated walls per code, including shaft ceiling. Pit to be waterproofed, see Section 7.1.

14.6 Warranty/Service

The contractor shall furnish a one-year warranty, and a one-year service contract (same day response) from the date of substantial completion, including travel expenses.

14.7 Inspection

Plan review and inspection should be by the same company that performs the annual inspections for the college.

Vertical Assessment Associates
8830 Freedom Rd
Tallahassee FL 32305
850 210-0401
gbailey@verticalassessment.com

MECHANICAL

15.1 Owner's Standard Construction Features / Requirements and Details

The following listed items are features which the Owner requires to be incorporated in the contract documents for a project. It is not to be assumed that the contractor will incorporate these items as part of his field work. The plumbing engineer and the mechanical engineer will ensure that these items are specifically identified on the construction documents and/or specifications.

15.2 Room Numbering

Design engineers shall ensure that it is clear to the contractors that the following charts and schedules reflect the Owner's Room Numbering System.

Valve Charts (both domestic/potable water and chilled water systems)
Software programs and graphics for control of equipment (i.e., Energy management Program, occupancy status, etc.)
Air Handler Unit Filter Charts
Lubrication Charts

15.3 Clearances

All Equipment shall have adequate and safe access/working clearances around it; whether it is floor mounted or installed overhead/above ceiling. In no instance will the Owner's personnel have to do the following to service any piece of equipment (this shall include access to fusible links located at fire damper assemblies). See Section 1.0 of this document.

15.3.1 The designer shall consider the installation/replacement of large and/or heavy components as it affects the size and location of mechanical rooms/spaces. Space and access panels must be allocated for the removal/replacement of Air Handler Unit (AHU) coils. This also applies to any required disassembly of adjacent equipment to facilitate repairs of the primary component beyond normal maintenance tasks.

15.3.2 Equipment shall not be located so general maintenance, and maintenance of equipment requires removal of light fixtures, electrical conduits or piping to service other pieces of equipment.

15.4 Design of Equipment Rooms

- 15.4.1 Architect and Engineer shall ensure that in the design of Machine Rooms, the room size is adequate to ensure that the equipment manufacturers' working clearances are achievable. Provide sufficient details, sections, etc., to develop a workable duct lay-out w/hangers and access doors, etc. Temperature gages are of little value if they cannot be read from floor level. Allow adequate space for duct transitions, bends, splitters and recommended straight duct runs to avoid air turbulence, radical pressure changes and system noise.
- 15.4.2 All floor mounted equipment and machinery shall be installed on concrete housekeeping pads at least 4" high. At curbs or sumps provide for adequate collection of condensation to drains without flooding the equipment room floor. Provide 10" min. between unit bottom and floor. Condensate may NOT discharge into the storm drain system without a 2" air gap and adequate back-flow water protection.
- 15.4.3 Water shut-off valves for toilet room/locker room areas must be located in the wall, or above the ceiling on the same floor, well identified and easily reachable in an emergency situation. Isolation or branch shut-off valves should be located in a mechanical room or above corridor ceilings. They must be identified with color-coded markers on the ceiling grid. DO NOT locate over a classroom or office.
- 15.4.4 All valves shall be identified with round brass stamped/engraved tags and secured to the valve with brass ball type chains. Numbering system shall be prefixed with a letter *P* for all potable water valves. Chilled water system valves shall bear only the valve identifying number.
- 15.4.5 Provide separate framed and glazed valve charts for the Potable Water System and for the Chilled Water System. The valve charts shall list the Valve I.D., Valve Function and Location of Valve (Owner's room number). The Chilled Water System valve chart shall be mounted in the main air handler room/pump room. The Potable Water System valve chart shall be mounted in the main first floor custodial room.
- 15.4.6 Provide 6" dia., glass faced, bourdon tube type pressure gages at the suction and discharge of all pumps on the inlet and outlet piping of all cooling coils, etc.

15.4.7 Thermometers: Provide digital variable angle thermometers WEIS DVU35 or equivalent. Stem lengths and thermometer wells/sockets shall be of proper length for use/location.

15.4.8 Colleges and Universities are increasingly leveraging their campus infrastructure and systems as living laboratories for interdisciplinary hands-on learning tools. Therefore, mechanical rooms should be well labeled and colored and allow room for small groups of people to gather and observe equipment. Clear coverings for switch boxes or similar are encouraged.

15.5 Thermostats

All thermostats shall have digital displays with override capability. Mount at 60" AFF.

15.6 Cast-in-place concrete housekeeping pads

Outdoor equipment shall be sized such that they provide a continuous 3' wide clear walkway/working surface around the entire perimeter of the equipment. Such equipment must be enclosed in a fenced enclosure (See Division 2 of this document for fencing information). Indoor equipment pads shall be at least 4" from walls and 12" from floor drains/sumps.

15.7 Operations and Maintenance Manuals (see also General Requirements, Manuals, Warranties & Bonds,)

At, or before substantial completion, deliver to the Owner one bound copy and two copies in PDF format of the Operations and Maintenance Manual for this project. Prior to turning these manuals over to the Owner, they will have been reviewed and approved by the Owner's project manager. The paper copy shall be bound in a 3-ring type rigid cover notebook and the PDF copies shall be delivered on a flash drive. The following information shall be typed and inserted in a clear plastic pocket on the spine of the notebook:

Name of the Manual
Name of the Project
No. of Volumes for this Division (i.e., 1 of 2, etc.)

The flash drive shall have the following information listed on the jacket cover:
Name of the Manual
Name of the Project

WARRANTIES: Each manual shall have a title page that includes the above information as well as the following additional information: Name, address, telephone number of the contractor and subcontractor and date of expiration of the warranty. All warranties are to be dated from the date of Substantial completion. Additionally, the manuals shall have a Table of Contents page and each section shall be easily identified by a tabbed (typed) divider sheet.

Also, identify the subcontractor that installed the equipment by providing their contact information.

15.8 Instructional Sessions

Before final completion, the subcontractor shall provide formal, scheduled instructional sessions for all systems and equipment furnished and installed under this division. A digital video recording of each training sessions shall be made, and three copies shall be provided to the owner prior to substantial completion. The subcontractor shall develop a schedule which identifies dates/times and the system to be addressed. This schedule will be forwarded via the Project Architect to the Owner for the Owner's review and approval. The Owner requires at least two weeks scheduling such training sessions. If this occurs close to holidays, or major college activities, a longer lead time may be required. The Owner shall have the right to request that the Contractor provide a manufacturer's representative to be present and assist at selected Instructional Sessions. A minimum of four hours of instruction shall be provided for each system or major piece of equipment plus instructional aids/tapes as available from the manufacturer.

- 15.8.1 Provide classroom training for the Building Automation System (BAS) in the listed quantities. Provide three-day basic operator training for four students. Provide four-day intermediate training for four students. Provide four-day advance training for four students.

15.9 Interruptions of Owner utilities or services

- 15.9.1 Scheduling utilities outage: Any intentional utilities outage must be scheduled with Campus Plant Operations at least seven days in advance. Certain interruptions may require longer notice. This applies to all utilities and all campuses.

- 15.9.2 Vehicular traffic: Any planned interruptions of normal traffic flow or loss of parking spaces must be scheduled with the Campus Security Office at least twenty-four hours in advance to allow for redirecting of traffic or loss of accommodations.
- 15.9.3 Contractors should not idle vehicles on property.
- 15.9.4 Accidental interruptions of services: Should any utility service be lost due to any contractor action; Campus Plant Operations shall be notified immediately.

15.10 College design standards

The following items represent the minimum design standards acceptable to Valencia College in the various mechanical systems and may exceed certain industry standards. The engineer shall incorporate these items in the various sections of mechanical and electrical systems.

15.11 Sanitary and Vent Systems

- 15.11.1 At all locations where floor drains occur, the floor surface shall slope towards the drain at 1/10" per foot. This shall be addressed and coordinated with the architect and structural engineer to ensure that it is coordinated throughout the documents.
- 15.11.2 All floor drains shall have 4" nominal P-traps, with primers. Trap primers shall be installed inside of walls and 18" - 24" AFF. Trap primers will not be installed overhead/above ceiling. Hinged door access panels with screwdriver operated door locking cams shall be provided in a size large enough to allow easy service or replacement of the valve.
- 15.11.3 Provide sufficient cleanouts so that the full length of the system can be accessed for rodding. Floor clean outs occurring at carpeted or finished floors shall be provided with cast brass crosshatched covers. Wall clean outs shall be accessible by hinged door access panels. Joints in vertical piping shall be at least 6" above floor. Approved caulked fire stop sleeves shall be used at all rated walls/slabs.
- 15.11.4 Polypropylene pipe may be used for acid waste in lieu of glass pipe. Acceptable manufacturer: Orion

15.12 Storm and Roof Drainage System

- 15.12.1 All horizontal storm drain piping shall be properly pitched and supported and shall have insulation/wrap for sound control. At all locations where wall cleanouts occur, provide hinged door access panels.
- 15.12.2 Condensate should drain to the sanitary system with a 2" air gap at the drain. Condensate capture for irrigation or toilet flushing is preferential and should be evaluated.
- 15.12.3 Where deemed economically feasible, cisterns will be installed for nonpotable uses which may include toilet flushing, and irrigation.

15.13 Water Distribution System

- 15.13.1 Provide an Interior Master Shutoff Valve for the building. This valve shall be located no higher than 6'-0" AFF and at the point of entry into the building. It shall be labeled with an engraved plastic sign either wall mounted adjacent to the valve or suspended from the valve with brass ball/bead chain.
- 15.13.2 Individual shutoff valves shall be provided in sufficient quantity and at strategic locations so that it will never be necessary to shut off the water supply to the building or a complete floor level due to a leak at any branch water feed or a fixture. Shutoff valves may be located overhead/above ceiling except at public toilet rooms. Shutoff valves shall also be provided in branch line feeds above corridor ceilings to each exterior hose bibb or wall hydrant. Locations of valves should be numbered and identified on the ceiling grid or access panel.
- 15.13.3 Only cold water shall be supplied to restroom lavatories.
- 15.13.4 Provide one hose bibb in each restroom, located beneath the lavatories and approximately 18" AFF. Piping for this valve shall be concealed in the wall. The handle shall be removed for custodial use only.
- 15.13.5 Provide one exterior wall hydrant every eighty lineal feet at outside walls of the building. Hydrant shall be recessed with cover.
- 15.13.6 Provide one hose bibb in each AHU room at 18" AFF.
- 15.13.7 All hose bibbs and wall hydrants shall be operated by removable keys/T-valve handles. Provide two keys for each valve.

15.14 Plumbing Fixtures and Accessories:

- 15.14.1 Fixtures, except for ADA accessible sink units, shall be manufactured by American Standard, Eljer or Kohler.
- 15.14.2 Stainless- steel sinks shall be manufactured by Elkay or Just.
- 15.14.3 All fixtures shall be minimum flow Urinals using 0.125 gallon per flush are to be utilized. For new installations or retrofits WaterSense labeled urinals are to be selected.
Toilets should be Dual-flush toilets and others using no more than 1.28 gallons per flush. For new installations or retrofits, toilets labeled under the EPA's WaterSense program are to be chosen, if available.
Faucets shall have aerators flowing at the rate of 0.5 gallons per minute or below.
- 15.14.4 Water coolers shall be Elkay EzH2O or equivalent and shall be wall-hung.
- 15.14.5 Supplies and stops shall be American Standard, Chicago, Eljer, Kohler or Speakman.
- 15.14.6 Carriers, supports, and floor drains shall be Josam, Wade, Smith or Zurn.
- 15.14.7 Showerheads shall be manual or electronic Sloan Act-O-Matic or equal that incorporate a self-cleaning design and a powerful spray for user satisfaction while complying with local governing water conservation regulations.
- 15.14.8 Special Fixtures
Each project may have requirements for special applications or fixtures. The Owner will furnish the requirements (and mfg. # if known) to the engineer who will complete the selection and design for the Owner's review and approval.
- 15.14.9 All fixtures shall be provided with wall stop valves (concealed or w/o handles).
- 15.14.10 Water closets and urinals should be wall hung and must be supported by carriers. Lavatories should be mounted in a counter. If they are wall-hung, they must be supported by a carrier. Acceptable model: Watts CA-421
- 15.14.11 Pipe wraps are required under all sinks in restrooms and any locations where the drainpipes are exposed (not in a cabinet).

15.15 Preferred Fixtures

The following fixtures are the College's preferences, although we will accept equivalent models by manufacturers listed above. All fixtures should have the most water efficient aerators available where possible.

15.15.1 Water Closet (including ADA accessible water closet, but at ADA mtg. height):

Bowl: American Standard No. 2257.001-White

Seat: Olsonite No. 95-White

Flush Valve: Hydrotek Battery Powered Dual Flush Model HB-128DF (Bat)

15.15.2 Urinal (including ADA accessible urinal, but at ADA mtg. height):

Urinal: American Standard No. 6590.125-White

Flush Valve: Hydrotek Model HB8-B1.125 (Bat)

15.15.3 Lavatory:

Bowl: American Standard No. 0475.047 White

Faucet: Hydroteck Model HB-5000E (Battery)

Gooseneck Faucet: Hydroteck Model 6000C

15.15.4 Lavatory, ADA Accessible:

Units will be provided under DIVISION 10 and installed under this division. Provide and install all necessary fittings, valves, etc. Supply only cold water to this unit, blank off hot water inlet to faucet. Mount per ADA requirements to accommodate a wheelchair.

15.15.5 Custodial Sink

Mop basin with continuous stainless-steel cap or commercial grade stainless steel.

Service Faucet: Chicago No. 897 w/rigid vacuum breaker spout, ¾" hose thread outlet, pail hook and wall brace, adjustable integral stop supply arms, rough chrome plated finish, 35" long heavy-duty black rubber flexible hose w/wall bracket. Protect walls w/S.S. splash aprons, 18" high.

15.15.6 Sink (Stainless Steel Bar Type at Lounges, Conf. Rooms, Labs, etc.)

Sink: Elkay Lustertone series (size to be specified by Owner per project/need requirements. Provide with one hole in deck unless HW is required.

Faucet: Chicago No. 50 w/GN2A rigid/swing Gooseneck, E3 Aerator, #369 Handles w/Chrome Plated Finish.

Basket Strainer: Stainless Steel, Elkay No. LK-35

- 15.15.7 Water Cooler
Acceptable manufacturers: Elkay Model # EVFSA4F or Halsey Taylor model # HAC8FS. Sunroc water coolers shall not be specified.
- 15.15.8 A water cooler with a bottle filling station should be included on the ground floor. Preferred Model: Elkay LVRCGRN8WSK
- 15.15.9 Lawn Yard Hydrant shall be Woodford Model No. Y70
- 15.15.10 Hose bibb shall be Chicago No. 387-E27-RCP, ¾" flanged female inlet, ¾" hose thread outlet, lock shield cap with removable 293-6 tee handle, polished chrome finish.
- 15.15.11 Wall Hydrant shall be Zurn No. Z-1310 Ecolotrol recessed Wall Hydrant
- 15.15.12 Where deemed economically feasible, cisterns will be installed for use of water in nonpotable uses, which may include toilet flushing and irrigation.

15.16 Water Heating Equipment

- 15.16.1 Sizes and quantities of electric hot water heaters will be determined by the project/building hot water needs and requirements.
- 15.16.2 Hot water recirculating systems will be solar and provided on all hot water systems supplying water to instructional labs (art, science, etc.), shops, production areas, food preparation areas. Provide a thermometer and well. Thermometer shall be adjustable stem for positioning for easy reading from any location.
- 15.16.3 If a building's need is confined to custodial closets, then each closet will be provided with a tank-less water heater.
- 15.16.4 Where sinks are installed in office environments under counter, electric, Instant hot water heaters may be installed. They shall be 115v, dedicated circuit.
- 15.16.5 Water heaters should be wrapped to increase efficiency.

15.17 Chilled Water System

- 15.17.1 Chiller/Package system shall consist of air-cooled liquid chillers (Screw Type) or high pressure centrifugal with vertical discharge cooling fans, evaporator, condenser, interconnecting piping, controls package, full operating refrigerant

and lubrication systems and required accessories; all mounted on a supporting steel frame. Unit shall have compressor un-loading from 100-0% of capacity and all ranges in between. Hot gas by-pass may be required to achieve minimal loading. Water cooled packaged units should be considered where appropriate. Air cooled chillers should have coated condensing coils. All chillers shall have variable frequency drives and be of frictionless design with no oil. Chillers are to have ice making ability in areas where the utility supports it.

Acceptable manufacturers are:

Air Cooled Chillers: Smardt, Daikin Applied, Trane, Carrier

Water Cooled Chillers: York, Smardt, Daikin Applied, Trane, Carrier

- 15.17.2 Provide thermometer wells, thermometers, gauge tapped connections with shut-off cocks and gages on both the inlet, and outlet, chilled water piping at chiller unit. If the chiller unit utilizes a condensing water system, provide this same configuration of thermometers and gages at/or directly adjacent to the condensing barrel at the chiller unit.
- 15.17.3 Provide motorized inlet modulating valves at the chilled water piping connections at a chiller unit. These valves shall be controlled by the Energy Management System (EMS) for the unit/building.
- 15.17.4 Multiple Chiller Package Units shall be piped in parallel and valved for redundancy or lead/lag selection. All underground CHWP shall be jacketed, pre-insulated and engineered with assy. drawings, numbered components complete with thrust blocks, expansion loops, gaskets, etc. The Engineer shall inspect pipe, etc., for cleanliness, rust, marker tape and installation. Chiller yards shall be designed for proper ventilation, service accessibility, sound control and shall include normal/emergency power equipment as required. Special attention shall be given to lightning protection.
- 15.17.5 Air handling unit control valves shall be Belimo Pressurized Independent Characterized Control Valves (PICCV) or energy valves.
- 15.17.6 Cooling towers shall be counter flow and have a minimal draft loss not greater than 0.0004% of design condenser flow rate. Acceptable manufacturer: Tower Tech Inc.
- 15.17.7 If dead ends are left for future connections provide a valve and flush connection.
- 15.17.8 Make up water shall be provided utilizing non-potable sources to the full extent possible (reclaimed water should be explored where feasible).

15.18 Chilled Water Pumps and Installation

- 15.18.1 Pumps which must be located outdoors or in an area subject to wet conditions shall be of the fully enclosed, rough service type and elevated on a concrete base. Pump and motor assemblies shall be protected from weather with an external metal rain guard constructed with galvanized materials.
- 15.18.2 Pump motors controlled by a variable frequency drive shall be inverter duty type, designed for such operation.
- 15.18.3 When it is necessary to encase a pump in insulation, the insulation will be designed and installed in such a manner that it can be neatly removed and reinstalled without damage. It will not be installed in a manner that requires cutting/sawing operations to remove the insulation and that subsequently requires the use of new insulation, paste, etc. to reinstall. Mechanical fasteners, clips, etc. shall be used for securing the various pieces of the insulation casing, and the joints sealed to prevent condensation.
- 15.18.4 Acceptable Manufacturers: Bell and Gossett, Taco, Armstrong

15.19 VRF and Mini-split Systems

VRF and mini-split systems acceptable manufacturer: Samsung or Owner approved equivalent. If multiple air cassettes are used, they shall provide a BACnet interface to the EMS system for monitoring. The systems shall have a minimum of a 10-year warranty.

15.20 Chilled Water Chemical Treatment

- 15.20.1 Chemical treatment for the Chilled Water System (CWS) is required and shall be based on water analysis prior to system installation. It shall include chemicals for startup, testing, contractor operation of the system through construction completion and for a period of one year after final acceptance of project by the Owner. Installation shall include test cabinet, equipment and test procedure manual as required for all systems.
- 15.20.2 Provide initial sock filter in primary CHW system and adequate traps and filter/strainers in secondary CHW system. Require adequate shop drawings to assure system has accessible components for operation and maintenance.
- 15.20.3 Chemical Treatment for the condenser water system shall be based on the Zero bleed system supplied by Vanguard Industries and will include water softener

with reclaim system, Blue Trak system, algaecide, turbo disc condenser filter, electronic corrosive and web-based monitoring.

- 15.20.4 CFCs: all new buildings shall utilize refrigerants that are classified as low impact (low impact refrigerants shall have an ozone depletion rating of zero and a global warming potential of no more than 50).

15.21 Packaged Air Handlers

- 15.21.1 Unit cases, floor pans and doors shall be of double wall construction, minimum 16-gauge galvanized steel with 2" thick, 1½" density insulation, whether of unit construction or individual panels for field assembly. Units shall be provided with a minimum 6" galvanized base rail w/lifting lugs and supported on isolation spring mounts. Large units shall be provided with a walk-plate to allow entry for filter replacement, coil cleaning or other servicing of equipment. Door hinges shall be stainless steel, and doors shall be gasketed. All metals used inside of the case shall be stainless steel, copper, or galvanized.

Acceptable Manufacturers:

AHU: York, Carrier, Daikin Applied, Trane, Miller Picking, Annex Air, Aeon

Terminal Unit: Enviro-tec, Metal-aire, Carrier, Daikin Applied, Trane, Price

- 15.21.2 Fans shall be direct drive curved as specified by the Engineer and rated at 15% more than the specified RPM. The motor shall be inverter duty type designed for operation with a variable speed drive. If direct drive is unavailable motors mounted on an adjustable base to allow for belt tensioning and alignment. Coordinate spring mounts.

- 15.21.3 Filters: all new construction shall include filter sensors for monitoring air flow (see Section 2 of this document). Filters shall be rated a minimum of 14 MERV or greater. The filter section shall be designed with access for changing on both sides of the case. This section shall have a filter differential pressure gauge mounted on the outside such that it is easily read. (Dwyer Magnahelic 2000 Series or equal).

Pre-filters: Extended surface (pleated) panel type. Acceptable source: Nalco, American Air Filters, Cambridge, Farr. Require Contractor to change pre-filters at any time static pressure exceeds .75"w.g. or .50" if final filters not installed.

Final filters: The filter section shall be designed with filter racks for 2" high efficiency 100% synthetic filters. The filters shall be rated at 14 MERV or greater. Acceptable source will be given by the Owner and will be determined by who has the filter continuing services contract.

- 15.21.4 At substantial completion, the contractor shall provide and install one complete set of filters for all air handling units, terminal units, etc., which utilize filters, and any additional spare filters as may be specified. Provide the Owner with documentation of filter purchases. Require the contractor to supply one complete set of spare filters at final acceptance in original cartons.
- 15.21.5 Provide and install at each main Air Handler Unit: A framed/glazed FILTER CHART which gives the following information:
Name & Number of the AHU
Manufacturer/Model No. of Filter
Type of filter (thickness and filtering medium material)
The total number of each size of filter required to perform a complete filter change at unit.
- 15.21.6 Ductwork: Shall be designed per system requirements and pressure ratings with adequate clearances, turning vanes, access openings, fire/smoke dampers, etc., with the Contractor requirement for coordination drawings and component access. Require testing of all ductwork by a third-party Contractor. Require all ductwork interior visible through grilles and registers to be painted flat black. All ducts shall be sealed throughout construction and temporary filter placed on face of returns to prevent contaminants from entering the system prior to startup. Ductwork and fan speed should be designed to minimize noise from air flow.
- 15.21.6.1 Dampers: All control dampers (actuated dampers) shall be Tamco Series 1500 or owner approved equal. Damper linkage rod shall be hexagonal. Damper linkage bearing assembly shall be maintenance free and require no lubrication per the manufacturer IOM. No metal-to-metal contact in bearing assembly is acceptable. Damper blades and frames shall be Anodized Aluminum only. Damper blades and framing shall have silicone seals, such that no metal-to-metal contact shall occur during damper actuation.
- 15.21.7 Energy Recovery Units should be included with each air handler. Acceptable manufacturers: Greenheck, Dais Analytic, Renew Aire
- 15.21.8 Bipolar ionization shall be considered for all new construction and retrofits.

Bi-Polar ionization shall use air needles in lieu of tubes. Single pole devices shall not be considered. Acceptable manufacturer: Global Plasma Solutions. The design team must receive approval from the College to use other manufacturers.

- 15.21.9 Lab Equipment Basis of Design: Accutrol air valves with ALC controls.
- 12.21.10 All exhaust fans in cafeterias and cafe kitchens shall be vented to the outside and shall be located so that they prevent induction into any air handling unit's outside air louvers.
- 15.21.11 Lab exhaust shall maintain proper plume and be energy efficient. Acceptable manufacturers: Lauren Cook, Greenheck.
- 15.21.12 Chilled beam. Acceptable manufacturers: Price or owner approved equal.
- 15.21.13 Displacement ventilation: Acceptable Manufacturers: Price or owner approved equal.
- 15.21.14 Carbon dioxide (CO₂) sensors: all new buildings shall include CO₂ measurement devices. Devices will be used to regulate the introduction of outside air in, under-air building zones, and shall be set to override outdoor air flow beyond design ventilation rates if the CO₂ exceeds acceptable levels. (In addition, CO₂ sensors shall be used in combination with Demand Ventilation to reduce wasted dumping of conditioned air in part-time occupied spaces. Spaces shall include but not limited to conference rooms, auditorium spaces, mailrooms and closet spaces). Existing buildings shall be scheduled to receive CO₂ sensors as part of any HVAC upgrade until established campus wide. CO₂ sensors are installed in most air-handling units and connected to the BAS.
- 15.21.15 Introduction of outside air shall be designed and operated in compliance with ASHRAE Standards.
- 15.22 System Controls Theory**

Review design and specifications with the Owner at 50% completion and any governmental reviews.
- 15.22.1 Controls requirements: Electronic microprocessor type employing Direct Digital Control (DDC) for all control sequences of total building HVAC system(s) unless specifically stated otherwise in the Control Sequence. Acceptable System: Automated Logic Controls or owner approved equal. Valencia will determine based on project specifics, campus and location.

- 15.22.2 Code considerations for controls logic, air quality and total system design:
Types of occupancy, percentage and grouping of each type by floor
Fresh air requirements for classrooms
Non-recirculated air from science laboratories, toilet rooms and utility spaces
Positive building pressure
- 15.22.3 Owner constraints on air quality:
CO² and VOC sensors
60% max. humidity
Occupancy sensors
Daily/weekly schedules
- 15.22.4 Other Owner considerations: Operating costs and maintenance frequency and costs.
- 15.22.5 A portable operator's panel (laptop computer) shall be furnished which can be connected to the system at any DDC controller location. The minimum requirements for this control panel are as follows:
3.0 Gigahertz i11 processor
4 gigabyte ddr2 ram
14" LED monitor
1 Terabyte hard drive
DVD + RW-RW
802.11ax wireless Bluetooth
1 Gigabyte or Nvidia video card
2-USBC ports
Serial port (can be via adapter)
As this technology is constantly changing verify this requirement with Owner prior to purchase.
- 15.22.6 The Main/Central Control Panel (when provided) shall have the following minimum requirements:
Quadprocessor system
32 gigabytes of RAM
1 gigabyte video card
32" monitor
3 – 4 terabyte drives in a Raid 5 Array
As this technology is constantly changing verify requirement with owner prior to purchase.

- 15.22.7 All DDC controllers shall be connected to a global information handler and to an Operator's panel via a communication bus allowing all controllers and the Operator's Panel access to all information contained within the system and shall be programmed with all points using BACNET/MSTP, BACNET/ARCNET, BACNET/IP PROTOCOL.
- 15.22.8 In addition to the local, workstation controllers shall be capable of seamlessly interfacing with local Campus Building Automation Network. Password access shall also be required. Provisions shall be provided to allow additional controllers to be added for future system modifications or additions.
- 15.22.9 Floor plans shall show heating and cooling zones throughout the building in a range of colors which provide a visual display of zone temperatures relative to their respective set points. The colors shall be updated dynamically as zones' comfort condition changes. All spaces shall have Owner room number identification. In addition, the graphics shall have pop-up graphic menus (minimum) as follows:
- | | |
|-----------------|------------------------|
| <u>Quit</u> | <u>Trends</u> |
| Alarms | Set points |
| Messages | Module Status |
| Schedules | Programming Parameters |
| Schedule Graphs | Utilities |
| Schedule Groups | Chiller Readouts |
- 15.22.10 Building zones shall be according to exterior/compass orientation, interior functions, i.e.,
 Classrooms, academic/computer laboratories, administrative office
 Faculty offices (this requires careful considerations as they are not always grouped together and must not be combined w/ classrooms)
 Assembly areas (over 50 seats)
 Circulation, lobbies, corridors (excluding stairs)
 Building support spaces and toilets which require exhaust
- 15.22.11 Science laboratories require total zone separations with isolated 100% pre-conditioned make-up air and exhaust air discharge above the roof. This system is to be operated twenty-four hours, seven days/week with volume and temperature controlled by occupancy and CO² sensors. Audible and visual alarms shall be provided in all spaces and shall report to the Campus Security Office.
- 15.22.12 Computer server rooms, phone rooms and other areas having sensitive communication equipment that produce heat shall be provided a separate air conditioning system e.g., vrf or mini-split system to maintain that equipment if

failure of the building chiller should occur. These units shall be monitored by BAS and be installed with high temperature alarms.

- 15.22.13 Groups of classrooms shall have individual control of heat/cooling without “averaging”. This must be carefully coordinated with the AHU, fresh/return air requirements and CO² sensors (which is an individual condition).
- 15.22.14 CO²/VOC Sensors: These devices need to have special consideration for side effects on the system. Their primary function shall be to reduce the requirement for outside (fresh) air when unoccupied for a programmed time. This can result in problems with humidity and air balance and would have to respond to the needs of each classroom.
- 15.22.15 Dampers and Operators: Outside, return, relief and exhaust dampers shall be of low leakage proportion/air type with spring return and failure-closed position. Electronic operators shall be positive gear driven. Outside air shall be preconditioned while maintaining a slight positive building pressure.
- 15.22.16 All relays, controls, etc., shall be mounted in accessible dust-tight control panels.
- 15.22.17 Software shall be designed to be user-friendly, modular with complete data-based entry with all programs and alarms/messages, color graphics package w/ floor plans and VC Room numbers. Refer to Division 1 of this document for additional information. The BAS shall interface with the common area lighting panels, main switch gear, variable frequency drives, chillers and generator.
- 15.22.18 Individual comfort levels shall be considered when sizing zones. No more than three individual offices should be on the same zone. Corner offices with large windows shall be a single zone.
- 15.22.19 User Control over System Configuration: Data base creation and modification. All changes shall be done utilizing standard procedures and be capable of being done while the system is on-line and operational. The system shall allow changes to be made through the portable operator terminal and from the central site, including new graphics. To aid the user, instructive prompting software shall be provided.
- 15.22.20 System Power failure; automatic restart: Power failures shall cause the system to go into an orderly shutdown with no loss of program memory. Upon resumption, power system shall automatically restart and print out the time and date of power failure (and restoration). The restart program shall automatically restart

affected field equipment. The operator shall be able to define an automatic power up time delay for each piece of equipment under system control.

15.22.21 System shall accumulate and track energy consumption. KWH and tonnage shall be displayed as actual, comparison to general use and carbon equivalents.

15.22.22 Provide one week of factory training for two operators at the general level and one week for two operators at the advanced level. Include manuals and other materials. Travel expenses will be paid by the college.

15.23 HVAC System Commissioning

15.23.1 This work shall be performed by the design team in accordance with the contract documents. Qualifications shall include ASHRAE Guideline 1-1989 (current issue) and shall be an experienced Florida licensed professional engineer acceptable to the Owner's project manager. This will require full submittal of procedures and documentation requirements at the start of construction including coordination with other systems (fire alarms, etc.). This process must be included in the Project Specifications and shall require coordination with the Owner's training. It shall include startup, checkout and sign-off for every piece of major equipment. The procedures are not performed in a timely manner as System Commissioning cannot occur until all components are complete and a startup and Commissioning Plan has been approved by the Engineer. Test and Balancing (T & B) cannot be performed until systems commissioning is complete.

15.23.2 The HVAC Engineer shall review with the Owner all requirements for this work during the design process and include in the Contract Documents all systems affected. Include requirement for full filter replacement at final acceptance prior to occupancy by Owner as verified by Commissioning Agent and Owner's project manager.

15.24 Test and Balance

15.24.1 T & B shall include all functions and therefore all components must be checked at the alternate season, in both occupied and un-occupied conditions, in order to check all conditions as well as proper functioning of the controls, and internal atmospheric conditions. Refer to Division 1 for additional information.

15.24.2 The T & B Agency shall be a contracted agent of the Owner. The Architect/Engineer shall secure quotations for this service from at least three qualified firms and shall recommend approval to the Owner who will contract and pay for this task. The T & B firm may need to start during the Commissioning

process as they become familiar with the system components. The Architect and engineer shall administer and review the work as performed by the approved T & B agent.

15.24.3 Review with the Owner all requirements for this work during the design process and include them in the Contract Documents.

15.24.4 A Certified T & B Report shall be performed on both the water and air systems of the project. The final Certified Report w/three copies will be delivered to the engineer for review and returned to the Contractor for corrections as required until approved by the engineer. This must occur prior to issuance of substantial completion. The T & B must include all functions and conditions. Therefore, all components and performance must be checked in the Alternate Season in both occupied and unoccupied modes. Refer to Division I for additional information.

15.25 Indoor Air Quality Testing

15.25.1 This work shall be performed by a qualified subcontractor as approved by the Architect/Engineer.

15.25.2 Review with the Owner all requirements for this work during the Design process and include in the Contract Documents. The results of air quality testing must be submitted in writing to the Owner as a condition of substantial completion.

15.26 Fire Suppression Systems

15.26.1 When required by code or by the Owner the Contractor shall furnish an approved and complete automatic wet pipe sprinkler system to serve all areas of the building as shown in the drawings and specifications. The engineer shall require full compliance with NFPA 13 as amended by local ordinances and connection to the municipal water system with appropriate back-flow water protection. This system shall be integrated with the Fire Alarm and Mechanical Systems for fans, dampers, elevator, exits and annunciators. A Fire Test Station and auxiliary drains shall be provided to minimize water damage due to head replacements, etc. Arm-over connections to heads are preferred. Sprinkler heads shall be located in accordance with NFPA 13 to provide complete room coverage. Heads shall be located on long ceiling tile centerlines. If indicated by local authorities or tests that there is insufficient municipal water pressure available to operate such a system at the highest portion of the building, then the engineer shall design an NFPA 20 approved Fire Pump System together with an approved emergency power source. An approved Fire Department connection

shall be available not less than 40' from the new structure. All systems and materials shall be in accordance with applicable NFPA Codes.

- 15.26.2 The engineer shall coordinate the design with all systems and interactions with the various architectural features and limitations such as allowable head locations in lay-in tiles or panels. If exterior heads are required by code at exits, they shall be wall mounted with chrome finish. This system shall be included on the required Systems Coordination Drawings by the Contractor, as well as the Reflected Ceiling Plans and Owner instructions.

ELECTRICAL

The following listed items are features which the Owner requires to be incorporated in the contract documents for a project. It is not to be assumed that the contractor will incorporate these items as part of his field work. The electrical engineer must ensure that these items are specifically called out in Contract Documents.

16.1 Contract Documents

16.1.1 The following information shall be provided in the contract document:
Electrical Panel Legends
Schematic Programs for the Fire Alarm System
Schematic wiring diagrams for all sensor control's, fan and relay controls, science labs safety/emergency circuits and alarms.

16.1.2 Electrical Identification

16.1.2.1 Electrical Panel Legends shall be accurate and detailed. Entries shall be accurate, abbreviated and specific, i.e., Rather than "doors" an entry would read: Auto. Drs.-Rm. 145 (which would indicate the automatic doors at Room 145).

16.1.2.2 Breakers/Panel no. shall be marked on each receptacle plate.
All internal labelling shall be typed.

16.1.2.3 Exterior panel board I.D., name, etc., shall be engraved plastic laminate.

16.2 Equipment Pads

16.2.1 All floor mounted equipment will be installed on 4" (min.) high cast-in-place concrete housekeeping pads. All raceways, conduits, etc., shall terminate at or above this level.

16.2.2 Cast-in-place concrete housekeeping pads that are installed at all outdoor equipment shall be sized such that they provide a continuous 3' wide clear walkway/working surface around the entire perimeter of the equipment and shall be a minimum of 8" above surrounding grade.

16.3 Electrical/Communication Rooms

The rooms shall be sized per building code and manufacturer's working clearances for the specified equipment. Equipment room lighting shall be on an emergency circuit. Communication rooms shall have emergency power and backup cooling on emergency power with alarm to building automation system.

16.4 Conduit

- 16.4.1 All below grade conduit, duct-banks shall be marked with 4" wide yellow plastic tape, installed no less than 12" above conduit with the name of the utility printed in large block letters in a contrasting color at not more than 10' intervals. No direct burial of wire will be permitted except for irrigation control wires or grounding wire per N.E.C.
- 16.4.2 Conduit shall not be run horizontally inside of walls, partitions and shall be run parallel or at right angles to the major building axes. All conduits penetrating walls shall be at 90° degrees to the wall.
- 16.4.3 All conduit shall be concealed except in mechanical or utility spaces and where noted to be exposed. All exposed conduits shall be painted and Panel/Ckt. legibly noted on all J-boxes.
- 16.4.4 Minimum size of power conduit shall be ¾" unless otherwise noted on drawings.
- 16.4.5 Minimum size of communication/data conduits shall be 1" (to a single box). Minimum size of data feeder to under floor duct banks shall be 2". Exposed conduit shall be run parallel or at right angles to the building's lines.
- 16.4.6 Conduit run concealed above ceiling shall be routed parallel or perpendicular (at right angles to building construction) and shall be grouped.
- 16.4.7 Provide spare conduits from the top of each flush mounted panel board tub to area above ceiling for future use. Provide one spare conduit (¾") for every three spare circuit breakers or spaces or part thereof. If panel board is on a partition, then the spare conduits shall be provided equally to both rooms. Provide pull strings in all empty conduits securely tied at ends.
- 16.4.8 Provide groups of spare/capped conduits to five feet outside the building's lines, or 12" beyond adjacent walks) as follows:
- 16.4.9 Conduits will be buried at a depth no less than 30" below finished grade.

- 16.4.10 Groups of conduits will be provided at every cardinal compass elevation of the building not to exceed 150' along a continuous wall of a building.
- 16.4.11 Each group of conduits shall consist of the following: Each with an engraved phenolic tag attached to the capped end identifying the originating panel. All conduits shall have pull strings securely attached at both ends:
One (1) - 1" conduit homerun to the nearest high voltage panel (277/480 v.)
One (1) - 1" conduit homerun to the nearest low voltage panel (120/208 v.)
One (1) - 2" conduit homerun to the nearest communications backboard
- Conduits in the group shall be spaced no greater than 16" apart nor less than 2".
- 16.4.12 The location of each group of spare conduits shall be marked on the outside of the building using a solid brass sign made of 1/8" thick material which shall be secured to the building with stainless mechanical fasteners.
- 16.4.12.1 This sign shall be 6" w x 3" h and shall have engraved in its surface the following: SPARE CONDUITS BELOW. The lettering shall be all uppercase letters, 1/2" h. and block style with letter stroke width of no less than 3/32".
- 16.4.12.2 The sign shall be mounted to the building directly above the centerline of the group of conduits and its bottom edge shall be 12" above finished grade.
- 16.4.13 Branch circuit conduits shall be parallel to building lines, secured to structure and sealed at all wall penetrations. Light fixtures shall not be "daisy chained." Flexible conduit shall be 1/2" min. dia. x 3' max. for motors, etc.; 3/8" min. dia. x 6' max. length for lights. All Junction boxes shall be identified with panel and breaker number.
- 16.4.14 Systems conduits shall be no less than 1" dia. unless otherwise noted on drawings. Multiple runs of 4" schedule 20 PVC (w/pull strings) shall create a loop from the Main Systems Room through all Systems rooms/frame closets and return to the MSR.

16.5 Under Floor Power/Data Duct System

- 16.5.1 Note: Sole Source Item (no equal). All shall be Walkercell Raceway System, as manufactured by Walker Corp., Parkersburg, WV.

Configuration shall be:

WCR1EE-10/24 or WCR2-10/24 w/PK series pre-sets and recessed service fittings per use requirements. Provide supports as required for slab-on-grade or 7" second floor slab system. Coordinate with Owner furniture plan.

16.5.2 Provide Walker floor boxes of the RAKMII Series for installation at concrete slab locations (specify appropriate material i.e., cast iron, stainless steel, etc.) for location.

16.5.3 Provide Walker floor boxes of the WAFI Series for installation at accessible floor installations.

16.5.4 Provide appropriate trim accessories for specified finished floor. Stainless steel at vinyl floors and carpet pans for carpeted rooms.

16.5.5 Provide accessories and fittings as required for electrical power, communications, TV, data, etc., systems. Four Data jacks and two duplex power receptacles are required at each floor box (recessed w/ access cover). Each power duct shall contain three circuits serving alternating floor boxes.

16.5.6 Walkercell Junction boxes (4 way) shall provide a maximum capacity matrix feed to all raceway systems. Box covers shall receive same floor finish as room floors. All data/tel. conduit feeders to the underfloor duct systems shall be 2".

16.6 Recessed Floor Boxes

Recessed floor boxes for power/data connections shall be Series 880 or Omnibox Series as mfgd. by the Walker Corp. Boxes shall be single or multiple gangs as required w/stainless trim.

16.7 Junction boxes and Wiring Troughs

16.7.1 All J-boxes shall have panel/circuit identified on the cover. Empty boxes for future use shall have system/panel I.D. marked on the inside of the box.

16.7.2 Fire Alarm boxes shall be painted red and manually/mechanically marked as such.

16.7.3 Due to cable constraints, systems pull boxes above ceilings for multiple cables, shall be wiring troughs measuring no less than 4"d. x 6"w x required length. They shall be installed with the cover facing down and shall have no obstructions between the ceiling and the trough.

16.8 Terminal Cabinets

- 16.8.1 Shall be flush/recess mounted except in machinery or utility spaces or as noted.
- 16.8.2 Where cabinets are flush or recess mounted, provide six spare 1" conduits out of the top of the cabinet and stub out of the wall 24" above ceiling. Three of the conduits will be stubbed out of one side of the wall and the remaining three out of the other side of the wall. Conduits to be stubbed out 6" from the wall and capped.
- 16.8.3 Terminal cabinets shall be keyed alike and keyed to match the building's electrical panelboards.

16.9 Wiring Devices Standards

- 16.9.1 Switch and Receptacle Colors shall be Ivory except as follows:
 - Receptacles served by emergency power shall be Red
 - Switches served by emergency power shall be illuminated when off
 - Switches and receptacles served by an Uninterruptible Power System (UPS) or surge protected panel shall be Gray
- 16.9.2 Wall plates shall be .040" thick satin finish, 302 grade, stainless steel with beveled edge, plain. Plastic or vinyl plates may be substituted.
- 16.9.3 Devices shall be ganged where permitted by code.
- 16.9.4 Provide a weatherproof GFI protected duplex receptacle every one-hundred fifty (150) lineal feet of exterior wall and near all entrances at a new building.
- 16.9.5 Provide GFI protected duplex receptacles at every air handler room, custodial closet and roof area with equipment. Min. qty: one (1) w/max. spacing of: 15'.
- 16.9.6 The electrical on/off control for automatic doors shall be operated by a rocker switch as opposed to a toggle switch.
- 16.9.7 Receptacle Colors shall be:
 - Emergency – red
 - Switched – Gray with (switched) label.
 - Standard – Ivory
 - Dedicated – Black

16.10 Panelboards

- 16.10.1 All panelboards will be recessed or flush mounted unless installed in machinery or utility spaces.
- 16.10.2 Provide one spare ¾" conduit from flush mounted panelboards to above ceiling for every three spare breakers or spaces or portion thereof. Spare conduits shall stub out of the wall 24" above ceiling for 6" and capped. Quantity shall be divided between both sides of wall; (see 16.4.8).
- 16.10.3 Panelboard legends accurately identifying the devices the breaker protects shall be typed using the Owners Room Numbering System.
- 16.10.4 All panelboards shall be keyed alike.
- 16.10.5 All panel boards shall have a minimum of 9 spare breaker slots.
- 16.10.6 Provide a minimum of two (2) ea. - 20a/1p spare breakers in each panelboard.

16.11 Over-current Protective Devices

Provide a Schedule of Fuses which lists all equipment which uses fuses and the quantity and size of fuses required for each piece of equipment. This schedule shall be framed and glazed and mounted in the spare fuse cabinet. Also provide this schedule in each of the O & M Maintenance Manual provided to the Owner.

16.12 Fixtures, Lamps and Switching Interior Spaces

- 16.12.1 All indoor lighting scheduled for new construction shall be LED unless an exemption is specifically authorized for a particular low usage fixture. As renovation projects continue throughout our campuses, the College intends to replace existing incandescent fixtures with the most current LED fixtures available.

Classrooms and Laboratories:	SP 41
Supporting spaces, Offices and Toilet Rooms:	SP 35
Rotundas and Lobbies: Compact Fluorescent:	SP 35
Acceptable Manufacturer:	Sylvania, G.E.

16.12.2 Interior Fixtures

- 16.12.2.1 Standard fixture is LED 2' x 4' lay-in.
- 16.12.2.2 Classroom storage rooms, laboratory storage rooms, office workrooms, file rooms and storage rooms should have 2' x 4' lay-in or wall mounted LED fixtures.
- 16.12.2.3 Main and secondary corridors should have 2' x 2' lay-in LED fixtures.
- 16.12.2.4 Restrooms should have 1' x 4' lay-in LED fixtures.
- 16.12.2.5 Engineering, custodial, custodial storage rooms should have 1' x 4' chain suspended, industrial type, LED fixtures. Also, provide one lamp (min.) emergency power/illuminated switch.
- 16.12.3 Switching and Vacancy Sensors
 - 16.12.3.1 Dual technology vacancy sensors will be installed in all offices, classrooms, conference rooms and utility rooms to reduce and/or turn off lights in unoccupied areas.
 - 16.12.3.2 Offices (enclosed private): Provide wall mounted vacancy sensors with pushbutton reset.
Offices (open areas): Provide low voltage master switch at the entrance and a ceiling mounted vacancy sensor.
Corridors: Vacancy sensors are not required by code; therefore, none shall be installed.
 - 16.12.3.3 Classrooms, Laboratories: Low voltage room control with two dimming switches at the entrance. Two lighting zones in the room: Front row of class and back of class.

Front row fixtures on emergency relay and separate switch. All conventional LED fixtures shall be on adjustable vacancy sensor with two fixtures per room fed from the emergency power branch via control relays for local switching and/or night light control.

LED fixtures in classrooms, laboratories and all teaching spaces shall be three, (3)-way switched. The other set of light switches shall be mounted adjacent to the marker board/Walltalker located at the front of the teaching space.
 - 16.12.3.4 Lighting panels shall be single room non-networked systems.

- 16.12.3.5 All fixtures occurring in public areas (lobbies, main and secondary corridors, restrooms, etc.) shall be controlled by the BAS.
- 16.12.3.6 Circuits serving corridor lights shall be switched through two contactors in the electrical room, which are scheduled controlled by the BAS system. (One contactor for normal power and one for emergency circuit). Provide BAS low voltage switch, or BAS device with built-in occupancy sensor, at each end of the corridor, for after-hours override on control. (Note: This switch will also turn on the switched receptacles that would be off after hours.)
- 16.12.3.6.1 Switched Receptacles: Circuits serving switched receptacles shall be switched through contactors in the electrical room that are schedule controlled by the BAS system.
- 16.12.3.7 Provide UL listed relays for the emergency circuit, to ensure the emergency lights turn on, when normal power drops in the building (this is a code requirement).

16.13 Exterior Fixtures, Lamps and Switching

- 16.13.1 Fixtures/Lamps. Should have downlighting fixtures for night sky compliance to current green building standards for the system used (LEED, Green Globes, etc.). Outdoor illumination will be LED with the efficacy of the lighting system being no less than 85 lumens per watt. Outdoor lighting shall be certified by the manufacturer as dark-sky compliant. The minimum lighting level at the property line shall not exceed one-foot candle (FC) unless required by code or security. Shielded fixtures shall be considered for all light trespass issues. Outside lighting shall be controlled by analog photocell through the BAS.
- 16.13.1.1 Provide 5100K LED, wall mounted, adjustable, bronze housing security floodlights mounted to the parapet wall at strategic locations. These should be similar to or match existing fixtures on the same campus. Review locations with Owner during the design process. Preferred Lighting Model ALXW LED product: Lithonia.
- 16.13.1.2 Walkway lighting: LED, 12' pole/standard mounted in the grass area adjacent to the sidewalk. These should be similar to or match existing fixtures on the same Campus. Review final selection with the Owner. Design to reflect security concerns, CPTED, etc.
- 16.13.1.3 Parking lot lighting: LED, Lithonia Area Luminaire RSX1 on 30' pole (125 mph. design). Poles shall be similar to, or match, existing on campus. All pole lights to

have fuses and grounding located in the base of the pole. The poles should be mounted on precast concrete bases extending 3' above pavement as a traffic guard.

- 16.13.2 **Switching**
Selected fixtures on Night-Lite ckt. On/off photocell only for safety. Feed from EM panel. On/Off controlled by BAS with photocell backup. Circuits serving exterior lights shall be switched through contactors in the electrical room that are schedule controlled by the BAS. Zones shall be separated by contactors as building exterior, walkway, security lights, parking lots and street lighting. Review final control sequences with owner during design.

16.14 Emergency Egress Lighting System/Fixtures

Internal exit signs shall be of the photo luminescent type that meets NFPA and UL 924 requirements. These signs will be approved by the owner prior to installation.

16.15 Standby Power Generator Systems

- 16.15.1 Emergency electrical power shall be provided and maintained to each facility on all campuses. The standard requirement for emergency power at all sites is a gas (LP or natural) generator providing 277/480v, 3ph, 4 wire service.
- 16.15.2 Diesel engine power will not be considered. Diesel fuel will not be allowed as a fuel.
- 16.15.3 Mufflers and exhaust pipes will be provided with condensate drains.
- 16.15.4 Provide battery charging system.
- 16.15.5 Provide engine run-time meter.
- 16.15.6 The concrete pad for outdoor installation shall extend a minimum of 3' on all sides of the generator.
- 16.15.7 Motor/generator shall be enclosed/air cooled for outdoor installation, including batteries and charger.
- 16.15.8 Generator Control Panel w/full controls, status indication lights, alarms, system meters w/ adj. controls, local and remote. Run/Off/Auto control. All required

features of NFPA 110. Provide MODBUS or BACNET connection so BAS can interface with unit.

16.15.9 Acceptable manufacturers: GENERAC, ONAN, KOHLER

16.15.10 Warranty/Service: Extended warranty; as available from Mfgr./Dealer.
One-year service contract w/installation; proposal to Owner for extension.

16.15.11 Generators shall be secured by walls or fencing on all four sides.

16.16 Primary Service

16.16.1 Primary power is furnished to each campus by a separate power company. The Owner's project manager shall contact the respective utilities company to determine basic requirements and fees to provide or expand existing primary service to the project. A blanket utility easement is generally negotiated with the Utility Co.

16.16.2 All primary service shall be via concrete duct-bank and approved buried PVC pipe to the transformer(s) supplied by the Utility Co.

16.16.3 Primary metering is generally provided by the Utility Co. at each transformer. Provide MODBUS or BACNET connection so BAS can interface with unit.

16.16.4 Underground secondary service shall be kept as short as practical. The engineer shall make provisions in this duct system for anticipated growth and coordination with other utilities on site. The Owner will pay for all required surveys.

16.16.5 Main service entrance gear and dry type transformers, whether floor or wall mounted, are part of the general contract.

16.16.6 The General Contractor shall pay for installation, repair and removal of all required temporary power service, temporary exterior lighting as required until the date of substantial completion of the project. Any such equipment and distribution shall be by the Contractor including removal and be maintained by same in accordance with all applicable codes.

16.16.7 Metering: all new buildings will have submeters installed to measure electrical consumption and, if possible, chilled water consumption.

- 16.17 Surge Suppression/Phase Monitoring Equipment (24V through 480V and Communication)**
- 16.17.1 Provide Surge Suppression at the following locations.
- 16.17.1.1 Each building service entrance switchboard and at other panelboards as determined by use/function.
- 16.17.1.2 At all wiring pairs and cable sheath if used entering or leaving the building: fire alarm, control wiring including emergency power, intercom system, HVAC control system, antennas and irrigation controls. All such equipment shall be UL listed and labeled for respective applications.
- 16.17.1.3 On the fire alarm system wiring at each conductor pair and cable sheath entering or leaving a building's respective terminal cabinet.
- 16.17.1.4 In other locations where equipment sensitivity to surges and transients requires additional protection beyond that inherent to the design of the equipment.
- 16.17.2 Provide Surge Suppression/Phase Monitoring equipment at the following locations for electronics or communication equipment:
- 16.17.2.1 At the point of connection of each piece of equipment item and its power supply conductors (direct wired equipment).
- 16.17.2.2 At all power distribution panels serving computer station receptacles.
- 16.17.2.3 Chiller control panel(s) and at all MDPs serving chillers.
- 16.17.2.4 Variable Frequency Motor Control units at exterior applications.
- 16.17.2.5 RF antenna connections.
- 16.17.2.6 At all pairs of wire entering or leaving a building.
- 16.17.3 Surge suppression/arrestor protection is required as follows: surge suppression or transient voltage surge suppression (TVSS) shall be provided at each building service entrance switchboard and other panel boards as determined by use/function. A quality surge arrestor shall be installed at each end use as well as at the source panel to all utility and communications circuits where they enter the building.

- 16.17.4 Warranties and service: All surge protection devices shall have five-year (min.) warranties and shall be repaired or replaced/at no expense to the Owner during such period. Any equipment that is damaged by such failure during the warranty period shall be repaired or replaced by the Mfgr. and/or Contractor. It is understood that lightning damage may preclude certain items or circumstances (refer to Lightning Protection System of this document).
- 16.17.5 Telephone/data service building interface will be protected by the respective utility suppliers.
- 16.17.6 Inspections: The Owner's project manager shall inspect the installation of all equipment listed above including photographs, if necessary, to assure compliance with the design documents, industry standards/good practices since it is recognized that workmanship and field conditions may affect the success or failure of this equipment.

16.18 Lightning Protection

- 16.18.1 The engineer shall specify/show the installation of a complete lightning protection system which shall be designed and installed in accordance with all requirements of NFPA 780 (at a minimum) and the LPA. This shall include the building(s), chiller yard, irrigation pumping equipment (if used), exterior lighting poles and signage/building illumination. Bond to existing building systems as required and require as-built drawings showing locations of buried grounding cables and access covers at ground rods for periodic measurements as needed. These covers shall be marked so as not to be confused with the irrigation system, or water valve boxes.
- 16.18.2 Label: The contractor shall be required to furnish a UL MASTER LABEL for the system.
- 16.18.3 Coordinate design of down-lead roof penetrations with roofing consultant using noncorrosive materials.
- 16.18.4 Grounding rods shall not be placed closer than two feet from foundations.
- 16.18.5 Require that downleads be routed away from the building electrical system and that connection to water service piping as required by code be marked.
- 16.18.6 Bond fencing at equipment yards to ground rods.

16.19 Fire Alarm System

16.19.1 New buildings shall be compatible with, and report to, existing Campus-wide system and annunciating panel. It must be fully addressable. There shall be at least one (1) FAAP located near the main building entrance. If possible, it should be visible from outside the entrance. Coordinate with Elevator and HVAC controls. This equipment is a Sole Source item.

16.19.2 All conduit, boxes, devices shall be adequately marked or color-coded. Audible/visual alarms are preferred in white; pull stations in red.

16.19.3 Require contractor to coordinate connection and programming to existing Campus system with all required documentation for O&M manuals. Provide the Owner with a copy of the system program and on a disk.

1. Provide lightning/surge suppression protection at FA panels/power sources.

2. All devices and panels will be recessed/flush mounted except in engineering spaces. All cabinets, panels, and devices shall be keyed alike (except elevator).

3. The assigning of device I.D. numbers will be coordinated with the Owner and Owner's System Consultant.

Design and installation shall comply with all current applicable NFPA Codes.

The contractor shall provide full documentation, training and demonstration of the system as required in Division 1. Owner will with-hold Final payment until full testing and acceptance of the system by the project engineer is complete and the Owner has received documentation of three-year warranty and twelve-month service contract.

16.20 Grounding

16.20.1 This Section is intended to ensure that all grounding requirements of the building are compatible and meet the Owner's needs for the various systems, now or in the future, will provide a safe environment and protect the Owner's equipment from possible damage.

16.20.2 All conduits shall have a bare equipment ground wire continuous from all equipment connections and bonded at all boxes and run to the feed panel and subsequently to the Building Equipment Ground.

- 16.20.3 All equipment rooms, communication rooms and closets, antenna connections, and computer/data rooms shall have a bare copper common bus/wire connection sized per the drawings which shall be run to the incoming building ground. It shall terminate in each room with one or more 2" x 8"x ¼" copper local Ground Buss with threaded holes and stand-offs for multiple equipment ground connections.
- 16.20.4 All connections shall be bolted or exothermic welded unless otherwise specified.
- 16.20.5 All grounding rod installations, connections, etc., shall be tested for ground resistance and the Owner shall be provided with a log of such readings, with the O&M submittal.
- 16.20.6 Bond building ground with adjacent equipment yard grounds within 50' of main building.

16.21 Telephone/Computer (Data)/Intercom/ Television Systems

16.21.1 Backboards

16.21.1.1 Backboards will be constructed of ¾" A/C grade plywood painted with fire retardant paint (bridal white - see paint specifications). Backboards shall be mounted with their long dimension 8' run vertically and their horizontal lineal footage will be determined by the size of the system being installed. They shall be mounted on top of ¾" furring strips and the bottom edge of the plywood sheet will be held 4" AFF.

16.21.1.2 Where backboard material is run continuously on a wall or around a whole room for several different systems the following shall apply.

Where one system's backboard ends and another system's backboard commences, a full length (painted) 1" x 2" vertical furring strip shall be installed to mark this separation of systems.

The name of the system shall be stenciled at the top/center of each systems section of backboard material in a contrasting paint color.

16.21.2 Individual System Requirements

An on-staff representative of the Owner will provide detailed systems requirements to the design engineer/architect. Meetings will be coordinated by the Owner's Facility Dept.

- 16.21.2.1 Provide a double-duplex surface mounted (dedicated 20a. circuit) at 18" AFF every four (4) lineal feet at the bottom of all backboard systems. Note: In some instances, the need for these outlets to be on the emergency electrical power system will be specified and required by the Owner.
- 16.21.2.2 Provide #6 insulated copper ground wire from each telephone/communication backboard to service entrance ground. Ground wire may be looped from backboards. Ground wire shall be installed in conduit. Provide ground terminal strip at each backboard. Leave 6' minimum slack of ground wire at each backboard.
- 16.21.2.3 All conduits will be labeled at each end with the opposing end's room number.
- 16.21.2.4 All empty conduits shall be provided with a continuous nylon pull string.
- 16.21.2.5 All conduit bends shall be long radius bends. In no instance shall the inside radius of a bend be less than six (6) times the "internal diameter of the conduit".
- 16.21.2.6 At all locations where flush/recess mounted wall boxes occur, and no device is to be installed (future/spare outlet) furnish and install a blank stainless-steel cover.
- 16.21.3 Electrical Requirements for Communications Rooms
 - 16.21.3.1 All IDF and MDF rooms shall have a dedicated 30 amp. circuit with a twist lock (NEMA L5-30P) receptacle. This should be located no more than 4' from the base of the patch panel rack for network equipment.
 - 16.21.3.2 All IDF and MDF rooms shall have at least a one double outlet box with a dedicated 20-amp circuit and NEMA L5-15P receptacles. This should be located no more than 4 feet from the base of the patch panel rack for network equipment. If possible, at the base of each rack.
- 16.21.4 Electrical Requirements for Tiered Classrooms (see following drawings)
 - 16.21.4.1 If a ceiling mounted projector is to be used, provide a ceiling mounted outlet for an LCD projector 12' from teaching wall and centered. Ceiling pan will be provided by others.
 - 16.21.4.2 If a powered projection screen is to be used, provide power for projection screen with low voltage interface relay and Dalite 40973 low voltage control switch for approved equal.

- 16.21.4.3 If a wall mounted projector is to be used, provide a double outlet for power at 102" AFF. Provide one (1) 1" conduit from 102" AFF to above ceiling for projector connection. Coordinate location with projector mounting plate.
- 16.21.4.4 Four speakers will be installed in the ceiling. Coordinate location with diffusers and lights.
- 16.21.4.5 On the side wall by the teaching station provide a single gang box with a 1" conduit stubbed out above the ceiling for network cables. Provide a quad outlet for power. Provide a double gang box with two 1" conduits stubbed out above the ceiling for A/V cables. These should be located 18" above the floor.
- 16.21.4.6 A/V equipment will be stored in a 2' x 2' cabinet in the corner of the room or in an enclosed podium. The podium will use the outlets at the teaching station (see previous paragraph). If a cabinet is used the same outlets would be needed at the teaching station and behind the cabinet.
- 16.21.4.7 Provide electronic locks on smart classrooms and exterior doors. The college has a continuing contract with:

Signature Systems of Florida
150 Wilshire Blvd.
Casselberry, FL 32707
407 644-8990

INFORMATION TECHNOLOGY

Please see the College standards in a separate document.