DESIGN & CONSTRUCTION STANDARDS

Version 1.0 | Issued 01.20.26

BROWARD COLLEGE

INTRODUCTION

The purpose of these standards is to provide the Design Professional Team and Construction Manager with a general listing of design criteria for Broward College. The manual is divided into Chapters (00-32), which reflect the Construction Specification Institute (CSI) 2020 Master Format. Chapters not applicable to construction design at the College have been omitted or shown as "Not Used". It is not the intent of these standards to insist upon any proprietary products, but merely to serve as a basis of design and quality for the College. The Design Professional Team and Construction Manager @ Risk are responsible for ensuring the items listed herein are incorporated into the project. Variances from the items listed herein should be coordinated with the Broward College Project Managers (BCPM) and confirmed in writing.

The BCPM is the designated single point of contact for administering a project and is considered the Owner's Representative. All contact and direction to the Design Professional Team and Construction Manager should be through this representative.

The Conformance Statement shall be signed by the Architect / Engineer of Record at submittal of the 100% Construction Document to the BCPM. Any comments, suggestions for improvements in the content of these standards are encouraged and always appreciated. We hope this guide will be of assistance to you and your Team. We look forward to a successful project to improve the quality of education at Broward College.

TOC

TABLE OF CONTENTS

BROWARD COLLEGE®

TOC

BROWARD COLLEGE®

TOC

BROWARD COLLEGE®

TOC

BROWARD COLLEGE®

00 1000 | SOLICITATION

1. Broward College holds Architects/Engineers and Construction Managers continuing services agreements for construction projects for the limits allowed by Florida State Statutes. These contracts are usually for a period of 3 years. Project specific solicitations will be issued for Architects/Engineers and Construction Managers for projects as determined by Broward College.
2. Architects/Engineers are engaged in the projects once the projects are approved by the college and an initial program is prepared by Broward College Facilities Budget and Planning Department.
3. A preconstruction agreement may be issued to the Construction Manager (CM) @ Risk to participate during the plan review process and assist with estimating efforts.
4. Once plans have been reviewed and approved by the Building Official, the CM @ Risk will be able to solicit bids. Refer to Appendix 00 01 for purchasing bid limits.
5. The advertisement shall be submitted to the BCPM. The BCPM will submit the draft to the College Procurement Department for review and approval.
6. Any project with an estimated construction cost of $300,000 or more must be advertised for at least three weeks. Projects with an estimated construction cost of less than $300,000 can be advertised for one week.
7. The CM @ Risk is responsible to prepare bid packages, advertise, receive the bid package, evaluate the bids and submit a GMP based on the lowest most qualified and responsive bids. In the event the lowest bid is not the most qualified, the CM @ Risk must submit a justification.
8. The typical GMP submittal package shall include the following documents:
    a. Cover Page
    b. Proposal Letter
    c. Table of Contents
    d. Schedule of Values
    e. Scope of Work, assumptions and clarifications as required
    f. Bid tabulation, scope sheet comparisons along with copies of bids
    g. Evidence of competitive bidding for Self-performed work (copies of bids or letter of refusal)
    h. Advertisement for Bid (newspaper ad, electronic solicitation ad, etc.)
    i. Index of contract documents
    j. Project Schedule
    k. Construction Manager Insurance. Refer to Appendix 00 02 for insurance requirements.
    l. Subcontractors SDBE log
    m. Performance and Payment Bond letter of intent
9. The agreed upon list of subcontractors listed on the GMP shall not be changed without BCPM approval. List shall include contractor name, address, phone number and state license number.
10. Insurance requirements if vendor will be putting work in place on college property:
    a. Broward College must be named as an additional insured and Certificate Holder:
    b. The college address to be use in the certificate of insurance is:
        Broward College
        6400 NW 6 Way, 2nd Floor
        Fort Lauderdale, Florida 33309

c. Coverage must be at least $1,000,000/$2,000,000 in regard to General Commercial Liability and $1,000,000 of Automobile Liability, including Workers Compensation pursuant to FL Statutory Limits.

11. No retainage is held on Preconstruction Purchase Order payments. A separate GMP Purchase Order will be issued to the CM @ Risk. No work shall begin without an executed agreement and Notice to Proceed letter. Refer to Appendix 00 02 for a Notice to Proceed sample letter.
12. BCPM must be invited to attend Bid Openings.

1. Typical General Requirements may vary with the size and complexity of any given project. Coordinate items of inclusion with the BCPM.
2. All design and construction drawings shall be 24" x 36". The architect shall produce a reduced set of construction drawings for use in the field scaled to half size. All details shall be clearly shown and accurately referenced on the construction drawings.
3. At the completion of the 100% construction document phase, the design professional shall provide CAD drawing (.DWG format) and .PDF files to Broward College (BC). The file naming protocol is as follow:
   a. Broward College Project Number first (ie. 0000-C15-00.0)
   b. Project Description (Room number if applicable)
   c. Type of Asbuilt (Discipline and progress phase)
   d. Date
   e. Example: 1032-C15-0.2 Rm 234 Mechanical Asbuilt - Final 04-10-2015 All CAD drawings and PDF documents are to be upload to Procore.
4. A list of all codes referenced on the project shall be included on the drawings. Contact Authority Having Jurisdiction (AHJ) to confirm appropriate version is used for permitting.
5. Any projects over $300,000 will be submitted to FDOE for review and approval. The Design Professional, with assistance from the BCPM, will prepare the following forms: OEF 111B, 208A, 209, and 564.
6. Each project shall include a site plan or at least partial site plan showing relative locations of existing buildings.
7. Field verify all topographic features, elevations, landscaping at project perimeter to ensure seamless tie-ins.
8. When designing a new building, the following shall be considered:
   a. Main building entrances shall be readily identifiable.
   b. Whenever possible, building orientation shall conserve energy and allow for natural light and ventilation.
   c. Provide identification and preservation of natural site feature.
   d. Vegetation buffers and areas to remain unclear shall be clearly noted on the drawing. The Contractor is required to protect these areas during construction.
   e. Provide an exterior building perimeter 2' wide, 4" thick, sloped concrete landscape skirting around the building.
9. Broward College endorses and supports the Integrated Project Delivery (IPD) method and expects all design team members and construction team members to actively participate and work towards maintaining a positive relationship among all team members throughout the project duration.
10. Coordinate with the BCPM when developing design for the following systems: Security & Access Control (refer to Appendix 28 01), Audio Visual systems (refer to Appendix 01 03), Doors and Hardware (refer to Division 8).
11. The structural plans shall clearly show all floor drain locations and the extent/limits that the concrete slab requires pitching towards the drain (i.e. emergency showers, mechanical rooms, etc.). Coordinate drains locations to avoid conflict with doors or other possible tripping hazards.
12. All exterior walls shall be continuous to the underside of the roof deck assembly. Do not design soffits venting into an attic space above interior spaces. Above ceiling spaces shall be designed airtight to prevent outside air from entering ceiling space. Roof insulation shall be designed in the roof deck assembly and not placed on ceiling assemblies.
13. EFIS wall systems shall not be specified for any building or structure.
14. The architect shall state in the contract documents all permits (i.e., Florida Building Code Permit, Water Manage-

ment District, Site, utility, Right of Way Access, etc.) that are applicable to the project. All demolition projects require a demolition permit. All low voltage projects will also require a separate low voltage permit. Architect shall create and maintain a permit matrix for the project.

15. Post all permits in conspicuous location. The contractor shall coordinate all inspections required during construction. CM @ Risk to send invite to BCPM for inspections. Invite to be sent via MS Outlook or similar digital calendar tool.
16. A/E to specify equipment based on the following:
    a. "Owner Furnished/CM Installed" - the Owner will provide the equipment. The CM will be responsible for relocating/receiving, installation, startup, testing and inspecting.
    b. "Owner Furnished/ Owner Installed" - the Owner will provide and be responsible for relocating/receiving, installation, startup, testing and inspecting. CM shall coordinate any additional requirements needed to accommodate the equipment.
17. All room numbering will be done by BC Planning and Capital Budget Department. If a project requires existing rooms to be re-numbered, the changes will need to be reflected on the electrical panels, fire alarm panel, intercom, energy management, security, local law enforcement, fire department, F.I.S.H., etc. and coordinated through the BC EMS group.
18. Designer to check and review the most recent Comprehensive Safety Inspection Report, Environmental Reports, Asbestos Reports, and ADA Survey for inclusion in project design.
19. New construction and renovation designs shall include a storage room for attic stock storage. Room shall be 120 NSF.
20. Provide Key Management System to include lockable key cabinet or cabinets on new facility construction and on major renovation projects. Provide space for every door and key tags. Coordinate with BCPM.
21. Assure door openings and passageways are sufficient for replacement or moving of appliances and/or equipment.
22. Submittals - Provide at least three (3) product options for each item or approved equal. Products identified in this manual shall take precedence. Refer to Appendix 01 04 for digital submittal process guidelines.
23. Verify that all products that require Florida Product Approval are so approved before specifying and the NOA is listed.

01 45 23 | VIBRATION MONITORING

1. Coordinate with the BCPM to evaluate whether seismic and vibration monitoring is necessary based on the scope of construction activities and the proximity of adjacent structures.
    a. The intent is to allow Broward College to monitor and document conditions in case of cracking or damage to adjacent buildings as a result of construction activities such as demolition, pile installation, or other vibration-generating work.
    b. Monitoring data would be documented and accessible to the project team, and notifications would be sent if measured vibration levels exceed the pre-established alert thresholds.
    c. This will ensure potential impacts are identified early and that appropriate monitoring is implemented when warranted.

01 50 00 | GENERAL REQUIREMENTS FOR CONSTRUCTION

1. The contractor is expected to work in a safe manner. The utmost consideration to safety should be given while working around students and staff.
2. Barricades should be maintained where required while construction is occurring and checked regularly. Contractor is required to submit a safety barrier plan and/or maintenance of traffic plan when affecting pedestrians and/or

traffic, to the BCPM and to the BC Building Department if required. A chain link fence 6 feet in height with windscreen will be required around all work sites.

3. Access to and from the construction area needs to be planned and agreed upon by all involved.
4. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise, vibration, odors or other disruption to Owner occupancy with BCPM.
5. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent properties. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
6. Subcontractors shall be required to attend a pre-construction meeting with the project management team before beginning their work. Refer to Appendix 01 01 for proposed agenda.
7. It is the CM @ Risk responsibility to locate all private and public utilities prior to beginning of construction. CM to coordinate the locates with Broward College continuing services surveyor (according to the campus where the project is located). CM @ Risk to make sure Broward College continuing services surveyor is present when locates are being identified. Broward College continuing services surveyor to document the subsurface utilities. This to include but not limited to the following: gas, water and sewer mains, water and sewer laterals, storm water, chilled water, electric transmission, recycled water, telephone and fiber optics. Existing utilities damaged during construction will be the CM @ Risk's sole responsibility to repair.
8. Clean construction site and construction debris daily.
9. Interaction with students and staff without BCPM presence is prohibited.
10. The CM @ Risk shall submit a comprehensive company safety plan with provisions specific to the project. The contractor, subcontractors and workers shall abide by the Broward College security procedures while on site.
11. The Architect shall require the CM @ Risk to submit Material Safety Data Sheets (MSDS) for all hazardous products and make them available at the job site.
12. Hot Work Permits shall be managed and issued by the CM @ Risk. All welding, torch and brazing activities require this permit.

01 57 19 | TEMPORARY ENVIRONMENTAL CONTROLS

1. The following conditions shall be specified to prevent issues due to mold growth in renovation and new construction projects.
   a. New construction and/or renovation: Prevent water intrusion into the building (including dew point/condensation conditions) during construction.
   b. Should water intrusion occur, the contractor shall take steps to immediately remove water, including dehumidification of the atmosphere as required to dry out the building, prevent entrapment of moisture with construction materials, and all other components of construction.
   c. Dehumidification through the use of building HVAC systems require the use of adequate filters to prevent distribution of construction dust, etc., in air handling and duct systems.
   d. If water intrusion occurs, all efforts shall be done to dry out affected material and material shall be removed immediately. Inspections shall be made on a continual basis to ensure no mold growth or conditions for mold growth exists, including, drywall, wall cavities or concealed areas affected by moisture. If mold is observed, the contractor shall be responsible to utilize consultant services to address the process and procedure for removing

mold by treatment and/or material removal.

e. Sequence of construction installations shall be coordinated in such a way that the building is weather tight and acclimated per manufacturer's requirements for finish products installation.

01 70 00 | CLOSE OUT REQUIREMENTS

1. CM @ Risk as-built site drawings to be submitted to the Broward College (BC) shall be certified by a professional land surveyor and clearly show all as-built conditions, elevations and utilities. The final survey must be incorporated into the BC Master Plan. CM @ Risk to coordinate with BCPM for surveyor vendor selection.
2. Architect to provide to CM @ Risk updated record CAD drawings inclusive of all revisions to each sheet for the CM to prepare as-builts. The contractor shall be required to submit a complete set of as-built drawings in Auto CAD (.DWG), a PDF copy and a hard copy.
3. BC requires surveys to be performed from time to time to support the design of improvements at the colleges various campuses.
4. The surveyor must meet with CM @ Risk to determine the site limits, scope of work, and insight into the purpose of the survey. Field work, in most cases, will take place during normal operational hours, so consideration must be made to not disturb the students or faculty. The surveyor should consult with staff to coordinate access and gain any security clearances that may be needed, before scheduling field work.
5. All survey work shall meet the Florida Rules 5J-17.050 - Minimum Technical Standards for Surveying and Mapping, as well as the specifications set forth herein.
6. When a project does not require a Building official (work such as painting, flooring installation, pressure washing, or similar activities), Broward College issues a Certificate of Completion for the project record. See Apendix 01 02 for a sample template.
7. Contractor to provide a Master Maintenance Schedule listing all equipment in the project that will require routine maintenance and showing the proper time intervals for each.

02 00 00 | EXISTING CONDITIONS

1. 1Architect / Engineer shall conduct an existing conditions assessment/observation including above ceiling and applicable mechanical and electrical rooms. The assessment shall be coordinated through the BCPM.
2. Architect & CM @ Risk shall reference BC's environmental reports prior to beginning of design/demolition activities. If hazardous materials are encountered during demolition, notify the BCPM immediately.
3. Where remediation procedures are required, CM @ Risk shall provide landfill records indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
4. The Design Professional shall invite BCPM to inspect existing inventory of equipment and components within area of work, and prepare a list of items to be removed, discarded, sold, relocated or stored. BC maintains right of first refusal.
5. Existing utilities indicated to remain in service shall be maintained and protected against damage during demolition or selective demolition operations. Allow for a timeframe (72 hours minimum) for notification prior to shut-downs or excavations that may affect existing infrastructure or operations.
6. Any areas damaged during demolition or selective demolition shall be repaired immediately, with approval of the Architect or Engineer, using approved methods and materials. Restore to match prior existing conditions.
7. CM @ Risk shall comply with governing EPA notification regulations before beginning demolition and with hauling and disposal regulations of authorities having jurisdiction.
8. Contractor shall notify Architect and Engineer of any discrepancies between the existing conditions and the building depicted in the plans and details.
9. Unsafe conditions discovered during construction shall be immediately shored and the Contractor immediately shall notify Broward College, the Architect, and Engineer.

02 40 00 | DEMOLITION

1. A pre-demolition conference shall be scheduled by the CM @ Risk 2 weeks prior to demolition activities.
2. CM @ Risk shall provide to the BCPM a building demolition schedule for approval prior to the start of demolition.
3. CM @ Risk shall submit pre-demolition photographs and/or video documenting all existing conditions before the work begins including roadway routes trucks will be utilizing.
4. When required by the College, CM @ Risk shall submit a logistics plan indicating area to be protected during demolition.
5. Building demolition shall be conducted so that operations of adjacent occupied spaces will not be disrupted.
6. Confirm that Sustainable Rating System requirements for Building Reuse for the project have been met.
7. Provide temporary closure of all roof, fascia, wall, and other openings to protect building from exposure to undesirable elements until new construction is weatherproofed, at which time such temporary construction shall be removed. All temporary exterior walls that are subject to wind loads are to be designed by a Florida licensed engineer.

03 00 00 | CONCRETE

1. A pre installation conference shall be conducted.
2. Mix Designs shall be submitted for each class of concrete or precast concrete by primary supplier. It is highly recommended to have secondary supplier's mix designs approved in the event the primary supplier can't accommodate the schedule.
3. The Design Professional shall identify materials and/or assemblies that need to be tested and indicate which testing agency is responsible for the testing. General Contractor shall retain services of independent third-party testing agency. Broward College reserves the right to retain services of testing agency for the project.
4. Testing Agency shall be an independent agency qualified in accordance to ASTM C 1077 and ASTM E 329 for testing indicated and other applicable agencies.
5. Shoring shop drawings and calculations shall be signed and sealed and prepared by or under the supervision of a professional engineer registered in the state of Florida.
6. Shoring shall be inspected by Florida licensed engineer that specializes in the design of shoring, prior to concrete placement. Inspection approval letter shall be provided to Broward College, the Architect, and Engineer.
7. Where required, contractor shall provide documentation indicating percentages by weight of postconsumer and preconsumer recycled content for products having recycled content. Include statement indicating cost for each product having recycled content for projects pursuing Sustainable Rating certification.

03 01 00 | CONCRETE REHABILITATION

1. Prior to starting repairs, install all temporary shoring, bracing, and supports. If the Contractor is unsure of these requirements, the Contractor shall retain a Florida licensed engineer to design and inspect the shoring, bracing, support, and stability of the structure. Work sequence shall not be performed in a manner that creates an unsafe condition or overloads the existing structural framing.
2. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means.
3. Sandblast corroded steel to a white metal finish to remove all contaminants and rust.
4. Apply corrosion inhibitor to cleaned and exposed reinforcing steel. Repair mortars shall have integral corrosion inhibitor.

03 30 00 | CAST-IN-PLACE CONCRETE

1. Steel reinforcing shop drawings shall include placing drawings.
2. Reinforcement fabrication shall be in compliance with CRSI's Manual of Standard Practice.
3. Formwork shop drawings shall be prepared by or under the supervision of a professional engineer registered in the state of Florida.
4. Informational submittals shall include current welding certificates, material certificates and material test reports.
5. The Design Professional shall provide a floor flatness and levelness schedule based on structure type and finish material.
6. Where required, Contractor shall provide Product Data for liquid floor treatments and curing and sealing compounds documentation including printed statement of VOC content for projects pursuing Sustainable Rating certification.
7. Where required, Contractor shall provide Product Data for each concrete mixture containing fly ash and/or slag as

replacement for Portland cement or other Portland cement replacements, and for equivalent concrete mixtures that do not contain Portland cement replacements for projects pursuing a Sustainable Rating certification.

8. Design Professional shall indicate control joint pattern for all slabs-on-grade. For exposed concrete applications, joints need to be cleaned and filled with approved joint filler compound for specific application. Location of all expansion/control joints shall be shown on plans.
9. Design Professional shall specify concrete finishes.
10. Waterstops shall be provided as follows:
    a. Flexible Rubber Waterstops: CE CRD-C 513.
    b. Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber waterstop.
    c. Flexible PVC Waterstops: CE CRD-C 572.
11. Provide Underslab Vapor Retarder System under all building slab on grade in compliance with ASTM E1745 Class A, with a water vapor permeance of not more than 0.010 perms, and not less than 15 mils thick. Seal joints, seams and penetrations watertight as specified by the vapor retarder manufacturer. Provide complete system from single source. Documents to include all penetration details.
12. Coordinate curing compound with concrete finish requirements for compatibility.
13. Expansion and Isolation Joint Filler Strips shall comply with ASTM D 1751, asphalt- saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork. Confirm compatibility of sealant with expansion joint filler material. Joint shall be covered with an approved flexible sealant.
14. A copy of all concrete test reports shall be provided to Broward College, the Architect, and Engineer.
15. Provide protection for Nosing on concrete steps with a factory fabricated two-part rounded cast nosing with nonslip surface.
16. Provide a non-slip aggregate surfacing on exposed concrete surfaces of ramps, stair treads and landings.

03 41 00 | PRECAST CONCRETE

1. The project specifications and drawings shall include information regarding structural performance of precast structural concrete, including loading criteria and fire resistance rating. It shall also include finish type, profile and reveals.
2. Structural precast shop drawings shall include member locations, plans, elevations, dimensions, sections, openings, support conditions, reinforcement and fabrication and installation of precast structural concrete units, signed and sealed by the professional engineer registered in the state of Florida responsible for their preparation.
3. Delegated structural design calculations for precast structural concrete shall comply with performance requirements and design criteria, including analysis data, signed and sealed by the professional engineer registered in the state of Florida responsible for their preparation.
4. Shop drawings shall be submitted to the design team for review. Review comments provided by the Design Professional shall be addressed in the shop drawings. Final shop drawings, after all review comments have been addressed, shall be submitted to the AHJ.
5. Informational submittals shall include qualification data for installer, fabricator and testing agency, welding certificates, material certificates, material test reports, source quality control reports and field quality control reports.
6. Fabricator qualifications shall require a firm experienced in the type of precast structural concrete in the project. In addition, fabricator's participation in PCI's Plant Certification and Erectors Certification programs will be required.
7. Welding qualifications shall include qualification of procedures and personnel in accordance to AWS D1.1, "Structur-

al Welding Code - Steel" and AWS D1.4, "Structural Welding Code - Reinforcing Steel". The Design Professional shall specify criteria for visually inspected and/or tested welding connections, frequency and type of tests.
8. Comply with the latest and/or adopted edition of ACI and PCI publications.
9. Concrete, admixtures, grout and steel reinforcement shall comply with ASTM standards.
10. Architect/Engineer to specify mockup sample to demonstrate reveals, surface finishes, texture, color and standard workmanship.

03 47 13 | TILT-UP CONCRETE

1. Tilt-up concrete shop drawings shall include panel locations, plans, elevations, dimensions, shapes, reveals, cross sections, reinforcing, details of steel embedment, MEP embedded items, additional steel reinforcement to resist hoisting and erection stresses, location and details of hoisting points and lifting devices, and fabrication and installation of tilt-up concrete units. It shall also include finish type, profile and reveals.
2. Shop drawings and/or calculations for the lifting, erection and temporary bracing of the panels, signed and sealed by the Professional Engineer registered in the State of Florida responsible for their preparation shall be required.
3. Shop drawings shall be submitted to the design team for review. Review comments provided by the Design Professional shall be addressed in the shop drawings. Final shop drawings, after all review comments have been addressed, shall be submitted to the AHJ.
4. Informational submittals shall include qualification data for installer, manufacturer and testing agency, welding certificates, material certificates, material test reports and field quality control reports.
5. Manufacturer qualifications shall require a firm experienced in the type of tilt-up concrete in the project is required. In addition, confirm that certification according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" is also required.
6. Installer qualifications shall include providing a qualified installer who employs a supervisor on Project who is an ACI-certified Tilt-up Supervisor.
7. Mockups are required and shall include casting and erecting tilt-up concrete panel to demonstrate typical reveals, panel joints, surface finishes, texture, color and standard workmanship. Include a window opening (no window) to demonstrate head, jamb and sill conditions.

03 52 16 | LIGHTWEIGHT INSULATING CONCRETE

1. The Design Professional shall indicate Design Mixtures required for each lightweight insulating concrete mix and testing schedule.
2. Provide an average insulation value of R-20 minimum and/ or more as required to meet the project's energy performance goals.
3. Material thickness shall be coordinated with roof drains, curbs and parapets.
4. Material thickness shall be accounted for in the structural design.

04 20 00 | UNIT MASONRY

1. Contractor shall submit samples for verification for each type and color of exposed masonry units and colored mortars.
2. Informational submittals shall include material certificates for each type and size of product.
3. Contractor shall provide submittal of design mixes for each type of mortar and for grout.
4. The Design Professional shall identify materials and/or assemblies that need to be tested and indicate which testing agency is responsible for the testing. General Contractor shall retain services of independent third-party testing agency. Broward College reserves the right to retain services of testing agency for the project.
5. Contractor shall provide building sample panel mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects.
6. Broward College requires blocks to be saw-cut only. Architect/Engineer to indicate in the project's specifications.
7. Do not use defective units (chips, cracks, etc.).
8. Exterior face of CMU cavity wall shall be fully coated with appropriate barrier to prevent moisture and water intrusion. Architect to provide complete specification.
9. Bituminous damp-proofing shall be specified as a troweled, rolled or sprayed-on application. If a sprayed-on application is considered acceptable, it shall be specified to be applied in no less than three separate coats per approved manufacturer's recommendations and verified to the Owner's satisfaction. Specify mill thickness in addition to number of coats (tolerances).
10. All exterior brick support angles shall be specified to be hot dipped galvanized or stainless steel.
11. All control/expansion joints shall be shown on the plans. Architect to show brick joints and engineer to show CMU joints. Engineer to provide all locations for control joints and expansion joints on approved documents.
12. Through-wall flashing systems shall be detailed on the drawings.
13. Split-face block shall be used as veneer only, not solid unit load bearing walls.

04 21 13 | BRICK MASONRY - FACE BRICK

1. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units.
   a. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished. On Drawings, show details of special conditions and special shapes required.
   b. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
   c. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
   d. For consistency, use face of brick. Saw cut is needed. Avoid turning and using end of brick to eliminate color variations (zipper effect).
2. Provide Facing brick complying with ASTM C 216, Grade SW, Type FBX or HBX Subject to the College's Approval.
   a. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67.
   b. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
   c. Surface Coating: Brick with colors or textures produced by application of coatings will not be allowed.
   d. Color and Texture: Size and color of Brick shall be coordinated with adjacent buildings and Campus standards.

Where shown to "match existing," provide face brick matching color range, texture, and size of existing adjacent brick-work.

e. A stand-alone 5' x 5' minimum Mock up shall be provided from a mixed sample of bricks.

3. Plastic/vinyl weep with cotton wick and stainless steel insect screen shall be used.
4. Only brick manufacturer's approved cleaning chemical shall be used. Specify final cleaning to be performed at completion of construction.
5. Brick tie backs shall be shown on the design documents.

05 00 50 | GENERAL METALS

1. Pre installation conference shall be conducted for all structural steel and joist framing installations.
2. Contractor shall submit documentation indicating percentages by weight of postconsumer and pre-consumer recycled content for products having recycled content, Include statement indicating cost for each product having recycled content for projects pursuing Sustainable Rating certification.

05 12 00 | STRUCTURAL STEEL FRAMING

1. Steel members exposed to the exterior and weather shall be specified as hot- dipped galvanized.
2. Contractor shall be responsible for scheduling all weld testing per plans/specs and manufacturer's recommendations.

05 21 00 | STEEL JOIST FRAMING

1. Where primer is required, it shall be shop applied. Joists that are permanently exposed to view shall be specified to be painted unless they are to receive spray fireproofing.

05 40 00 | COLD-FORMED METAL FRAMING

1. Cold-formed metal framing shop drawings shall include layout, spacings, sizes, thicknesses and type of cold-formed steel framing; fabrication; fastening and anchorage details, including mechanical fasteners; reinforcing channels; opening framing; strapping, bracing, bridging, splices, accessories, connection details and attachment to adjoining work.
2. Cold-formed metal framing calculations for all exterior applications that are subject to dead, live and/or wind loads, shall be signed and sealed by the Florida registered Professional Engineer responsible for their preparation and following the design criteria indicated in the structural drawings.
3. Shop drawings shall be submitted to the design team for review. Review comments provided by the Design Professional shall be addressed in the shop drawings. Final shop drawings, after all review comments have been addressed, shall be submitted to the AHJ.
4. Contractor shall submit product data for each type of cold-formed steel framing product and accessory required for installation.
5. Informational submittals shall include welding certificates, product test reports, and research reports.
6. All exterior cold-formed metal framing shall be G90 coated. All cold-formed metal framing 16-GA or thicker shall have a yield strength of 50ksi. Framing thinner than 16-GA shall have a yield strength of 33ksi.
7. Miscellaneous materials shall be in compliance with the following:
    a. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B.
    b. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404.
    c. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing silica sands, Portland cement, shrinkage- compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.
    d. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.
    e. Sealer Gaskets: Closed-cell neoprene foam, 1/4-inch-thick, selected from manufacturer's standard widths to match width of bottom of exterior track or rim track members.

1. Preferred materials and finishes for the following:
    a. Ladders:
        i. Exterior locations: Aluminum, Class I Natural Anodized Finish.
        ii. Interior locations: Steel, Galvanize after fabrication to ASTM A123/A123M requirements.
    b. Metal Railings
        i. Exterior locations: Aluminum, Class I Natural Anodized Finish.
        ii. Interior locations:
            1. Aluminum, Class II Natural Anodized Finish or high-performance multiple coat thermally cured fluoropolymer system meeting AAMA 2604.
            2. Steel, Prefinished, high-performance polyester powder coating system meeting performance requirements of AAMA 2604.

06 00 50 | GENERAL MATERIAL AND FINISH STANDARDS

1. Low Emitting Materials: As general practice, composite wood and agrifiber products used on the interior of the building (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins and that laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins. Composite wood and agrifiber products include plywood, panel substrates and door cores.
2. Wood sourcing shall conform to Florida Statute 255.20; Specification of State-produced lumber.

06 10 53 | MISCELLANEOUS ROUGH CARPENTRY

1. Provide only pressure treated material for all lumber in contact with concrete, masonry, the ground, or water. Verify that the types of treatment that are acceptable for each type of exposure and the retention level of preservative been specified.
2. The Design Professional shall indicate the type and treatment of fasteners in contact with pressure treated lumber.
3. Plywood backing panels shall be installed on all walls in the telephone/communications/ data rooms and closets. Treat with a low VOC, water based, intumescent, fire retardant paint.
4. Metal Blocking is preferred over wood blocking for support of finishes, fixtures, specialty items, accessories and trim. See 09 21 00 - Non-Structural Metal Framing and Gypsum Board Assemblies.

06 10 53 | INTERIOR ARCHITECTURAL MILLWORK

1. All interior architectural woodwork to be "Custom" grade in accordance with latest edition of the AWI "Quality Standards", unless higher grade is specifically required by the College.
   a. All joints shall be glued under pressure and nailed. Use of staples is not acceptable.
   b. Drawer's joints to be locked shoulder (dovetail), glued under pressure and nailed.
2. Wood Based Components: Core Materials
   a. Exterior Grade Veneer Core Plywood, Grade AB, minimum 7-ply, comply with PS-1.
   b. Lumber: Solid wood hardwood, Grade 1, kiln-dried to minimum of 12 percent moisture content at fabrication.
   c. The use of Medium-Density Fiberboard (MDF) is not permitted.
3. Plastic laminate shall be in compliance with NEMA Standard LD3-2005, in thicknesses as follows:
   a. Exposed exterior vertical: 0.030 inch
   b. Exposed interior surfaces (including backs of doors): 0.020 inch
   c. Toe space base (black): 0.030 inch
   d. Countertop horizontal surfaces and edges: 0.050 inch
   e. Backsplash vertical surfaces and edges: 0.050 inch
   f. Drawer fronts: 0.050 inch
4. Provide Plastic Laminate on all exposed surfaces of cabinets, including doors, drawers, countertops, and back splashes unless otherwise noted. Finish shelves on all sides and edges with plastic laminate.
5. Hinges for 3/4-inch thick doors shall be steel with satin finish, concealed, self-closing flush overlay type and 165 degree opening.
   a. Product Basis of Design: Blum Inc., CLIP top 170, www.blum.com
6. Surface-mounted, ADA compliant, decorative pulls shall be in US26D (satin chrome) finish, by Stanley, EPCO, or equivalent.
   a. Pull Style must be reviewed and approved by BCPM.

7. Door catches to be provided as follows:
    a. For doors up to and including 38-inches, provide one heavy-duty magnetic type catch, slotted for adjustment.
    b. For doors over 38-inches, provide two (2) heavy-duty magnetic type catches.
8. Shelf supports to be provided as follows:
    a. End supported standards, KV #255 Steel, Knape & Vogt or equivalent, secured with No.5 flat-head screws. Where chemicals will be stored, provide aluminum standards.
    b. End support clips, zinc plated, KV #256ZC, Knape & Vogt or equivalent.
9. Fabrication requirements: Conform to AWI (full overlay design) unless specifically directed otherwise by the College.
10. Use Exterior Grade Veneer Core Plywood, typical, unless noted otherwise, in thickness as follows:
    a. Cabinet body, End Panels, Countertops, Doors and Drawer faces: ¾ inch thick.
    b. Cabinet Backs: 1/4 inch thick.
    c. Drawer sides, back, sub-front, and bottom: 1/2 inch thick.
    d. Shelving: 3/4 inch Shelving: ¾ inch thick.
        i. Maximum 36 inches unsupported width.
        ii. Capable of supporting 50 pounds per lineal foot.
    e. Base: 4 inch high, 3/4 inch Exterior Grade Veneer Core Plywood or Lumber.
        i. Provide each base cabinet with its own unit base, factory applied.
11. Omit dust covers.
12. Countertops, Backsplashes, and End Splashes:
    a. Provide 4 inch min. backsplash and end splashes.
    b. Plastic laminate is typical material. Other materials may be allowed based on BCPM review and approval.
13. Configuration
    a. ADA Compliant Sinks: Provide sloped removable plastic laminate panels under countertops typical.
    b. Preferred Microwave location is on top of the counter.
    c. Provide no less than 18 inches between the countertop and upper cabinets.
    d. Standard countertop heights are 36 inches typical, and 34 inches where required for ADA compliance.
    e. Use standard width cabinet dimensions as much as possible, provide filler panels where needed.
14. Restroom Lavatory Counters: See requirements in Appendix 09 02.
15. Installation requirements: Coordinate, locate and install wall structure reinforcement, wood grounds and back bracings in wall construction prior to installation of casework items. Attach countertops securely to base units. Spline and glue joints in countertops. Provide concealed mechanical clamping of joints.
16. Rough-in requirements: Provide holes in casework for plumbing and electrical work using templates furnished by suppliers of plumbing fixtures and electrical devices. Unnecessary oversize cut opening or sloppy opening will not be acceptable. Escutcheon plates shall be used when penetration is exposed to view.

06 83 16 | FIBERGLASS REINFORCED PANELING

1. Provide at Janitor's closets, all walls, full height.
2. Basis of Design: Crane Composites, Inc. Sequentia embossed wall panels.
3. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
4. Moldings and Trim: Polypropylene; color coordinating with pane

5. Panel Size: 4 by 8 feet.
6. Panel Thickness: 0.09 inch.
7. Color: White.

07 00 50 | GENERAL STANDARDS

1. All new, repair, and replacement roofing projects shall have plans and specifications developed by a registered architect. Plans and specifications are subject to BC Facilities Construction Project Manager and Roofing Consultant approval.
2. General: Rooftop MEP Systems are to be minimized to the greatest extent practicable. Do not locate air handlers on the roof. Where unavoidable, provide code required clearances from surface of roofing system for proper maintenance and drainage of roof. Accommodate MEP systems with prefabricated curbs, carriers, and penetration seals.
   a. Roof Penetrations: Provide factory fabricated roof penetration seals and equipmentsupports to all roof penetrations.
   b. Pitch pans will not be permitted.
   c. Pre-manufactured boots and sleeves shall be used.
   d. When the placement of MEP equipment on the roof is unavoidable, support with pre-engineered equipment supports or round pipe supports fabricated of aluminum, stainless or hot-dipped galvanized steel (G-90).
3. Product Test Reports shall be required for roof materials, indicating that roof materials comply with Solar Reflectance Index requirement for projects pursuing Sustainable Design certification.
4. The following roof drainage requirements shall be met: Provide roof system with a minimum positive slope to drain of 1/2-inch per linear foot.
5. External rainwater systems such as scuppers, collector heads, gutters and downspouts that discharge into underground storm collection system are preferred for new construction. Discuss and decide on a direction pertaining to this item with the BCPM
6. If used, roof drains are to be positioned at low points in the roofing system (not over columns). For new construction, drains are to be connected to storm drainage leaders located adjacent to perimeter building walls. Drains are to be a minimum 24" away from vertical walls and are to be sump pumped into roof. All roof drains shall have cast iron lids.
7. Crickets and saddles shall be provided between drains and on the up-slope side of equipment penetrations as per NRCA and FBC.
8. Maintenance access requirements: Provide roof walks at logical access ways to protect roofing system from maintenance traffic. Provide OSHA compliant roof access for maintenance personnel. Whenever possible, a stairwell shall be extended to the roof leveland an access door 3' x 7' shall be provided. Provide exterior rain guard, overhang and upturned curb threshold support for door weather protection. Provide OSHA compliant signage for fall protection on door.
9. Parapet walls shall have roofing membrane installed as a complete system including coping.
10. All buildings shall have a roof building identification number. Refer to Appendix 07 01.
11. Provide roofing manufacturers standard heavy-duty walking pads to all mechanical equipment and around all sides of equipment, a contrasting color is preferred.
12. Unless required by Structural Engineer, all supports, and penetrations shall be round pipe. Square pipe, angles or unistrut through roofing system is not permitted.
13. Specification of OSHA roof tie downs shall only be used if no other options are available. The College prefers not to install tie downs since they require annual certifications and testing.
14. Provide roof access hatches and ladders to high roof areas, example: auditorium roofs, gymnasium roofs, cafeteria roofs and multistory classroom roofs.

07 11 00 | WATERPROOFING

1. Waterproofing shall be required on the soil side at below grade conditions. Where hydrostatic pressure is likely, sheet membrane waterproofing or "Bentonite" or equal shall be employed. Required at all elevator pits.
2. Provide a seamless continuous positively bonded elastomeric waterproof membrane at "between slab" on plaza decks, parking decks, or at planters primarily on concrete and masonry surfaces.
3. Wet walls shall utilize a waterproofing membrane compatible with the finish product to be installed over it. Showers shall utilize a waterproofing membrane on floors and full height of walls. Provide complete system with valves, sleeves and accessories.
4. All waterproofing membrane systems shall include a minimum 10-year warranty.
5. Sprayed on waterproofing for masonry restoration shall be water based only unless prior written approval by BCPM.

07 18 00 | TRAFFIC COATINGS

1. Material compatibility shall be required so that primers; base, intermediate and topcoat; and accessory materials are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience. Indicate sourcing limitations for traffic coatings and pavement markings from single source from single manufacturer respectively or be compatible.

07 27 00 | AIR BARRIERS

1. Use Air Barrier Association of America (ABAA) Evaluated Air Barrier Assemblies. Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.
2. Ensure a a continuous seal is formed by a vapor and air barrier for each building enclosure.
3. Where masonry veneers are used a water proofing barrier over substrate is required.

07 41 00 | METAL ROOF PANELS

1. Product Test Reports shall be required for roof materials, indicating that roof materials comply with Solar Reflectance Index requirement for projects pursuing a Sustainable Rating certification.
2. Warranty Requirement: Minimum 30 year Manufacturer's Weathertightness Warranty.
3. Performance requirements:
    a. Exterior products under this section shall meet or exceed requirements of the Florida Building Code (latest edition), including the high-velocity hurricane zone requirements, for wind resistance of components and cladding, with any local code amendment requirements. Product approval required.
    b. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and wind loads and stresses within limits and under conditions indicated, based on testing according to ASTM E330.
4. Approved Metal Roofing: Factory-Formed, Seamed-Joint, Standing-Seam Metal Roof Panels formed with vertical ribs at panel edges and flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels, and mechanically seaming panels together. Include clips, cleats, pressure plates, and accessories required for weather tight installation. Metal roof panels shall not be roll formed on the job site unless approved by BCPM

5. Approved panel materials:
   a. Aluminum-zinc alloy-coated steel complying with ASTM A792/A792M; minimum AZ50 coating or Aluminum complying with ASTM B209.
   b. Recycled Content of Steel Sheet: Postconsumer recycled content plus one- half of pre-consumer recycled content not less than 25 percent. AAMA 621.
6. Coating requirements: Color as approved by Broward College.
   a. Exposed Finish: Fluoropolymer Multi-Coat System complying with AAMA 2605: Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' writing instructions.
   b. Required to achieve a Solar Reflectance Index (SRI) equal to or greater than 78 or 29 (depending on slope) when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency.
   c. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil."
   d. Finish Warranty: Minimum 20 years.
7. Insulation requirements: Polyisocyanurate (ISO) Board Insulation, ASTM C1289 or Extruded-Polystyrene Board Insulation, ASTM C 578, Type X, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively. Insulation must be listed as part of tested roof system assembly per the Product Approval.
8. Underlayment requirements: Self-Adhering, Polyethylene-Faced Sheet: ASTM D 1970, 40 mils thick minimum, consisting of slip-resisting polyethylene-film reinforcing and top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied. Underlayment must be listed as part of tested roof system assembly per the Product Approval.
9. All roof curbs shall be provided and installed by the roof system manufacturer and be designed for that specific roof system.
10. All lightning arrestor system parts shall be secured to the metal roofing standing seams with anchor clips acceptable to or provided by the roofing manufacturer.
11. Do not adhere anchors to the standing metal seam roof system.
12. Penetrations must be kept to a minimum.

07 52 16 | STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE ROOFING

1. Built-up modified bitumen roofing system with an average insulation value of R-20 and/ or as required to meet the project's energy performance goals, light-colored ceramic granular surfacing.
2. Warranty: 20-year "No Dollar Limit" Total Roof System warranty inclusive of roofing materials from roof deck to finish membrane. Include 1 year maintenance in conformance with warranty requirements.
3. Basis of design shall be Soprema or equal as determined by ASTM equivalents.
4. Performance requirements:
   a. Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
   b. Exterior products shall meet or exceed requirements of the latest Florida Building Code including the high velocity hurricane zone requirements and its amendments for wind resistance of components and cladding with any local code amendments. Product approval required.

   c. The roofing system design criteria shall meet with the requirements of ASCE
5. Insulation requirements: Code compliant material capable of providing required average R-value. Insulation manufacturer shall guarantee the re-roof ability of the insulation substrate.
   a. Lightweight Insulating Concrete shall be compatible with the roofing system and the requirements of this Section.
      i. Coordinate deck venting requirements with roofing manufacturer requirements.
6. Minimum Two ply SBS modified bitumen roofing assembly compliant with ASTM D6164 Type I
   a. Base ply shall be Mechanically Attached where applicable so to provide maximum uplift resistance
   b. Base ply may be partially adhered over LWIC deck using a cold adhesive or torched applied where applicable so to provide maximum uplift resistance
7. SBS-modified bitumen membrane. Non-woven polyester reinforcement. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods: Minimum Thickness: 118 mils (3.0 mm)
8. SBS-modified bitumen membrane Cap Sheet with mineral granule top surface. Non- woven polyester reinforced. UL Class A for specified roof slope requirements. Meets or exceeds ASTM D6164, Type I, Grade G, per ASTM D5147 test methods: Minimum Thickness: 157 mils (4.0 mm)
9. Solar Reflectance Index (SRI) no greater than 75 when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency.
10. Wall flashings and Roof penetrations shall be flashed using manufacturer's approved 2 plies of SBS-modified bitumen membrane. Non-woven polyester reinforcement. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods: Minimum Thickness: 118 mils (3.0 mm). Manufacturer's approved reinforced liquid applied flashings.
11. Provide Walkway Cap Sheet Strips providing access to all rooftop equipment, Grade G, Type I or II, composite polyester- and glass-fiber-reinforced, SBS- modified asphalt sheet; granular surfaced; suitable for application method specified, in compliance with ASTM D 6162 and granule color gray.
12. Sealants shall not be used as the primary waterproofing system component at terminations in the roofing system components.
13. All base flashings shall extend a minimum of 10" up the vertical surface of curbs, walls, or roof penetrations. It should be noted that the dimension is from the top of the membrane to the top of the base flashing.
14. The Design Professional shall coordinate the preferred installation method with Broward College's Project Manager. Hot mop method is preferred but may not be suitable for projects where in close proximity to occupied facilities.
15. Roofing systems by GAF will not be permitted based on past performance.

07 54 16 | KETONE ETHYLENE ESTER (KEE) ROOFING

1. Ketone Ethylene Ester (KEE) based sheet roofing system with an average insulation value of R-20 and/ or as required to meet the project's energy performance goals, membrane color shall have a high solar reflectivity (SR) and infrared emittance (IE) as rated by Cool Roof Rating Council.
2. Warranty: 20-year "No Dollar Limit" Total Roof System warranty inclusive of roofing materials from roof deck to finish membrane. Include 1 year maintenance in conformance with warranty requirements.
3. Performance requirements:
   a. Exterior products under this section shall meet or exceed requirements of the Florida Building Code (latest edition), including the high-velocity hurricane zone requirements, for wind resistance of components and cladding, with any local code amendment requirements. Product approval required.

4. Membrane roofing shall be mechanically fastened, or fully adhered KEE membrane roofing system as defined by ASTM D6754 Standard Specification for Ketone Ethylene Ester Based Sheet Roofing.
5. Basis of Design is Fibertite Roofing Systems 50 mil Fibertite-XT.
6. Insulation requirements: Code compliant material capable of providing required average R-value.
7. Provide manufactured required flashing components and accessories specific to the selected system.
8. Provide manufactured required bonding adhesive specific to the selected system.
9. Walkway protection materials providing access to all rooftop equipment are required. Walkway protection product shall be equal to Fibertite Mellow Yellow walkway material (Basis of Design) KEE modified vinyl formulation with UV stable yellow pigment and ribbed texture.

07 62 00 | SHEET METAL FLASHING & TRIM

1. Require Fabricated and Manufactured sheet metal items, including flashings, copings, edge metal, scuppers, rain water collector heads, gutter, downspout and rainleader systems of the following materials:
   a. Aluminum: ASTM B209, Multiple coat, thermally cured fluoropolymer finish system meeting AAMA 2605, 0.040 thickness at edge detail and 0.050 thickness at coping.
   b. Stainless Steel: ASTM A 167-91 Type 304, soft temper 24 gauge minimum thickness, smooth 2B finish.
2. Comply with SMACNA (ASMM) requirements and the Florida Building Code (FBC), whichever is stricter.
3. Copings shall be provided at all parapets regardless of height. Provide joints with standing seams, or under-plate splice cleats for all coping installations.
4. Copings must meet ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by the FBC.

07 71 29 | MANUFACTURED ROOF EXPANSION JOINTS

1. Performance requirements:
   a. Exterior products under this section shall meet or exceed requirements of the latest Florida Building Code including the high velocity hurricane zone requirements and its amendments for wind resistance of components and cladding with any local code amendments.
2. Roof Expansion Joints installer is required to be the same as the Roofing installer for quality assurance.
3. Source Limitations: Obtain roof expansion assemblies approved by roofing membrane manufacturer and that are part of roofing membrane warranty.

07 72 00 | ROOF ACCESSORIES

1. Performance requirements:
   a. Exterior products under this section shall meet or exceed requirements of the latest Florida Building Code including the high velocity hurricane zone requirements and its amendments for wind resistance of components and cladding with any local code amendments. Product Approval required.
2. All roof accessories shall be in compliance with SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
3. Approved metal materials:
   a. Aluminum Sheet: ASTM B 209, alloy and temper recommended by manufacturer for type of use and finish.

b. Aluminum Extrusions and Tubes: ASTM B 221, alloy and temper recommended by manufacturer for type of use, mill finished.
c. Stainless steel sheet and shapes: ASTM A 240/A 240M or ASTM A 666 type 304.

4. Roof hatches:
   a. Fabricate with insulated double-wall lids and insulated double-wall curb frame with integral deck mounting flange and lid frame counter flashing, Aluminum preferred.
   b. Weld or mechanically fasten and seal corner joints.
   c. Provide continuous weather tight perimeter gasketing.
   d. Provide integral telescoping ladders when a fixed wall mounted ladder can't be provided. Where a wall mounted fixed ladder is installed, provide a vertical safety post (Bilco ladder up or equal). Provide a fall arrest system if over 24 feet in height.
   e. Provide aluminum roof hatch units minimum size 48"x48" as manufactured by Bilco Company, "Models S50, F50HZ", or equivalent. Opening dimensions must meet requirements of the Florida Building Code (FBC) Section 1011.12.2 Roof access.
   f. Hatch shall be located over 10 feet away from away from roof edge to avoid code required guard rails.
   g. Provide hatch with access control tie in.

07 92 00 | JOINT SEALANTS

1. Acceptable manufacturers include Sonobourne, Dow, Tremco, Chemlink or equal.
2. Sealant color, where applicable, shall match color of adjacent surface(s), typical.
3. Urethane sealants with minimum 10 year warranty will be accepted. Silicon sealants with minimum 20 year warranty will be accepted.
4. Field pull test shall be mandatory on all sealants by certified agent.

07 95 00 | EXPANSION CONTROL

1. All exterior sealants shall be adequate for UV exposure.
2. Contract documents to indicate joint type, location, dimensions and sealant to be used. All interior and exterior joints shall receive sealant, including sidewalks.
3. All floor-to-floor systems shall be recess mounted, mechanically anchored, Class II, clear anodized aluminum metal, heavy duty traffic and/or pedestrian rated as required with dual durometer gaskets with a flat profile, free of ridges/reveals that collect dirt.
4. Coordinate recess block outs for expansion joints and adjacent finishes for a continuous floor surface.

08 00 50 | GENERAL STANDARDS

1. All exterior openings shall be provided and installed as a system or assembly and are required to meet or exceed requirements of the Florida Building Code (latest edition), including the high-velocity hurricane zone requirements, for wind and impact resistance of components and cladding. Exterior products shall be designed and tested to be impact resistant as a system in accordance with the Florida Building Code and provide Product Approval.
2. All exterior entry doors shall be insulated and recessed the width of the door or provided with an exterior overhang for weather protection.
3. Main entry doors shall be equipped with ADA operators including the proper signage. Coordinate with operation of Card Readers when required.
4. Doors to group toilets shall be equipped with ADA operators. Avoid doors in series at restrooms and configure floor plan to avoid sight lines into restrooms.
5. A minimum door leaf size of 3′-0″ x 7′-0″ shall be specified for both interior and exterior doors. Standard door height is 7′-0″ (6′-8″ door height is not permitted in new construction projects).
6. Where large furniture, fixtures and equipment are included in the project, or may be required in the future, doors (both exterior and interior) shall be sized to allow for moving the items in and out.
7. All doors must comply with ADA/Florida Building Code requirements for size, opening/closing force, time delay on closer-equipped doors, etc.
8. Hollow Metal Doors are preferred for most applications. Flush wood doors are acceptable for offices and as approved by BCPM. Provide Aluminum storefronts for main entries.
9. All mechanical, IT, Communications and elevator machine rooms shall have insulated hollow metal doors.
10. All janitor closet doors shall swing out and shall be protected with a non-metallic impact protection panel at bottom 42″ of door (interior side).
11. Wall louvers shall be provided in lieu of exterior louvered HM doors whenever possible.
12. Provide door and frame assemblies that meet the STC rating required per the STC chart in Division 09.
13. Vision Panels and Sidelights:
    a. Indicate vision panels and sidelights on door schedules or interior elevations for BCPM review and approval.
    b. Provide glass that meets the required fire and smoke rating of the opening or partition.
    c. Vision panels and sidelights should not have any window treatment to block vision such as blinds, curtains, drapes, or frosting.
    d. Provide door vision panels or sidelights per the following guidelines:
        i. Classrooms, Labs, and Conference Rooms: Provide a vision panel or a sidelight. If the room has windows or storefront on the same side as the door, then no vision panel or sidelight is required, unless that glass is frosted, or vision is blocked in any way by a window treatment.
        ii. Offices: Provide sidelights only, no vision panels on doors.
        iii. Corridor / Stair access: Provide a vision panel or a sidelight.

08 11 13 | HOLLOW METAL DOORS & FRAMES

1. Exterior Doors: Provide a sealed top cap to prevent water from accumulating in door. Specify full gasketing and threshold install in full bed of sealant. SDI Standard steel doors level 3 – Model 2 (Extra Heavy duty – seamless). Exterior Door Face Metal Thickness: 16 gauge, minimum.

2. Interior Doors: SDI Standard steel doors level 2 – Model 2 (Heavy duty – seamless). Interior Door Face Metal Thickness: 18 gauge, minimum.
3. Fabrication of hardware reinforcement plates shall be from same material as door face sheets to comply with the following minimum sizes:
   a. Hinges: Minimum 0.123 inch thick by 1-1/2 inches wide by 6 inches longer than hinge, secured by not less than 6 spot welds.
   b. Closers, and Concealed Holders: Minimum 0.067 inch thick.
   c. All Other Surface-Mounted Hardware: Minimum 0.067 inch thick
4. Provide Standard Steel Frames in compliance with ANSI A250.11, and in accordance with Door and Hardware Institute (DHI) publication "Installation Guide for Doors and Hardware".
   a. Exterior HM frames to be at least 14 gauge. All exterior HM frames shall be grouted.
   b. Interior HM frames to be at least 16 gauge.
5. Require Zinc Coating for all Doors and Frames: Provide metal components zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M.
   a. Exterior locations, or Interior locations subject to corrosive conditions: A60/ZF180.
   b. Interior locations, typical: A25/ZF75.
6. All hollow metal doors and frames shall comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Finish standard steel door and frames after assembly.
7. Field-painted doors and frames shall be shop primed. Shop Primer: Manufacturer's standard, one coat of baked-on rust inhibiting prime paint in accordance with ANSI/SDI A250.10; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.
8. Knockdown frames not allowed. Welded frames required.
9. Wrap around frames are required at service area (Maintenance, cafeterias, etc.).
10. Provide continuous sound batt insulation at the inside of all interior steel frames.
11. All hollow metal frames set in masonry shall have the interior field coated before installation with a brushed applied bituminous coating and grouted solid during installation. Frames set in CMU masonry construction shall have 4 inch heads. For new construction, tie frames to block-work rather than bolting.

08 14 16 | FLUSH WOOD DOORS

1. Contractor shall submit chain-of-custody certificates indicating that flush wood doors comply with F.S.C. requirements and further indicate cost for each certified wood product as applicable for projects pursuing Sustainable Design certification.
2. Contractor shall submit product data for adhesives and composite wood products documentation indicating that product contains no urea formaldehyde for projects pursuing Sustainable Design certification.
3. Provide factory finished white birch quartered slice, slip matched, Grade A veneered- faced doors with lumber core assemblies with lifetime warranty (for interior use only). Stain color to be confirmed with owner.
4. Provide solid staved core conforming to WDMA I.S. 1A with a minimum style width of 2 inches. Particleboard cores are not permitted. Closure hardware shall be fastened with through bolts and finish washers. The top and bottom of wood doors shall be coated at the jobsite after hanging with clear varnish to seal the exposed wood. This shall be required even if doors are "Factory Sealed.

08 31 13 | ACCESS DOORS AND FRAMES

1. Provide Flush, Insulated, Fire-Rated (when applicable) Access Doors and Frames with Flush Trim: Fabricated from steel sheet with spring type automatic closer and self-latching bolt operated by key with interior release.
2. Provide Flush Access Doors and Trimless Frames: Fabricated from steel metallic-coated steel sheet at Gypsum board wall and ceiling surfaces with spring-loaded concealed pin type hinges and screw driver or pinned-hex access operated cam latch. Size as appropriate to meet accessibility requirements of device.
3. Provide stainless steel access doors at bathrooms, custodial closets and finish tiled surfaces.

08 31 23 | FLOOR ACCESS DOORS - EXTERIOR

1. Provide door and frame assembly designed to withstand AASHTO H-20 Wheel Loadings suitable for use in off-street locations where not subjected to high density traffic with the following features:
   a. ¼ inch Aluminum diamond pattern plate cover and ¼ inch aluminum channel frame with recessed anchors.
   b. Type 316 Stainless steel hardware.
   c. 1-1/2 inch drain coupling and heavy duty check chain
   d. Engineered lift assistance for one-hand operation and automatic hold-open arm locks.
2. Refer to Appendix 08 01 for Basis of Design.

08 33 23 | OVERHEAD COILING DOORS

1. Exterior aluminum Kynar finished overhead coiling doors to withstand design wind load with current NOA without evidencing permanent deformation or disengagement of door components. Large manufacturer sticker not allowed.
2. Provide Fire Rated Stainless-Steel Door Curtain Slats at food service locations: ASTM A 666, Type 304; sheet thickness of 0.025 inch (0.64 mm).
3. Provide Endlocks and Windlocks for Service Doors to have safety switch along bottom of door and gasketing to prevent water intrusion.
4. Coordinate power requirements with electrical and coordinate with fire alarm as required. Provide and coordinate a complete operational system including structural support framing, anchorage, and trim.

08 33 26 | OVERHEAD COILING GRILLES

1. Provide Open-Curtain Grilles for open areas that require security. Manual or motorized door operation as confirmed by BCPM.
   a. Aluminum Grille Curtain: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
2. Provide bottom bar finished to match grille with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
3. Provide concealed installation of overhead coiling grilles at all interior/occupied spaces.
   a. Where a concealed condition is not possible, provide aluminum hood 0.040-inch- (1.02-mm-) thick aluminum sheet complying with ASTM B 209 (ASTM B 209M).
4. Coordinate power requirements with electrical as required. Provide and coordinate a complete operational system including structural support framing, anchorage, and trim.

08 41 13 | ALUMINUM FRAMED ENTRANCES AND STOREFRONTS

1. Provide heavy-duty commercial systems for interior and exterior applications as follows:
   a. Doors/ Entrances: Provide manufacturer's standard designs. Custom designs permitted only approved by Broward College.
   b. Finish: Provide manufacturer's standard finish colors for BCPM approval.
2. Structurally Reinforced Members:
   a. Exterior Applications: Coordinate the structural framing system with the Product Approval (NOA) allowable opening sizes to accommodate the storefront system.
   b. Interior Applications: Require the submittal of delegated engineered drawings and calculations to confirm adequate structural support of the interior system.
   c. Provide steel members with aluminum cladding, finished to match frames, as required to meet the design intent of the glazed openings.
   d. Applied trim must be of the same metal and finish as storefront system. Plastic trim is not allowed.
3. Sill flashing shall be provided as part of exterior storefront system.
4. Contractor shall submit Product Data for adhesives and sealants used inside of the weatherproofing system, including printed statement of VOC content for projects pursuing Sustainable Design certification.
5. Contractor shall submit documentation indicating percentages by weight of postconsumer and preconsumer recycled content for products having recycled content, Include statement indicating costs for each product having recycled content for projects pursuing Sustainable Design certification.
6. Provide exterior aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.
7. Provide a Finish Warranty: 10 years for anodized finish and 20 years for factory coating system. .
8. Provide Field Testing for water penetration and air leakage of installed exterior storefront system in accordance with AAMA 503.
9. Interior Storefront Systems for Offices: Demountable Partitions preferred, see Division 12.

08 44 23 | GLAZED ALUMINUM CURTAIN WALLS

1. The structural framing system shall be coordinated with Product Approval (NOA) allowable clear spans to accommodate curtain wall system.
2. All miscellaneous steel connections for curtain wall system shall be coordinated with the building's structural system.
3. Curtain-wall systems shall maintain an average U-factor of not more than 0.66 Btu/sq. ft. x h x deg F when tested according to AAMA 1503, or as required to meet energy efficiency project requirements.
4. Provide manufacturer's standard finish colors for BCPM approval.
5. Installer Qualifications: shall be capable of assuming engineering responsibility and performing work of this Section and who is acceptable to manufacturer. Engineering Responsibility: Preparation of data for structural-sealant-glazed curtain-wall systems including the following:
   a. Shop Drawings, Project-specific preconstruction-testing program development, and comprehensive engineering analysis by a qualified professional engineer.
   b. Quality-control program development and reporting complying with ASTM C 1401 recommendations including, but not limited to, system material qualification procedures, preconstruction sealant-testing program, and

procedures and intervals for system fabrication and installation reviews and checks.

6. Qualifying procedures and personnel shall be according to AWS D1.2, "Structural Welding Code-Aluminum."
7. Structural-Sealant Glazing shall be provided in compliance with recommendations in ASTM C 1401, "Guide for Structural Sealant Glazing."
8. Provide a Finish Warranty: 10 years for anodized finish and 20 years for factory coating system.
9. Provide Field Testing for water penetration and air leakage of installed curtain wall system in accordance with AAMA 503.

08 51 13 | ALUMINUM WINDOWS

1. For aluminum windows, all extrusions shall be 0.125 inch minimum thickness with stainless steel hardware fasteners. Screens shall be included and specified as aluminum.
2. Finish: Provide manufacturer's standard finish colors for BCPM approval.
3. If windows are designated as Egress windows, required signage and egress must not conflict with window shades.
4. Applied trim must be of the same metal and finish as Storefront system. Plastic trim is not allowed.
5. Provide a Finish Warranty: 10 years for anodized finish and 20 years for factory coating system.
6. Provide Field Testing for water penetration and air leakage of installed windows in accordance with AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440.

08 62 00 | SKYLIGHTS

1. Skylights are not permitted without prior Owner's approval. The use of clerestories is preferred.

08 71 00 | FINISH HARDWARE

1. Coordinate Finish Hardware requirements for each room with BC PM and BC Locksmith
   a. For existing building renovations, perform a walk-through to confirm proper operation of existing door hardware and for coordination with new access control devices.
2. Provide each kind of hardware from one hardware supplier (DHI Certified Architectural Hardware Consultant) to the greatest extent possible.
3. All card reader access door locations shall be coordinated with Broward College Access Control Manager and all applicable frames shall be identified for preparation.
4. Provide hardware that conforms to published templates generally prepared for machine screw installation.
5. Contractor shall provide a covered and dry secure lock-up for all hardware items delivered to the project for storage until installation has been completed. Protect installed hardware through Substantial Completion and issuance of Certificate of Occupancy.
6. Supplementary marking on door: Provide UL label indicating Fire Door to be equipped with fire exit hardware and provide UL label on exit device indicating "Fire Exit Hardware" where panic exit devices are required on fire-rated doors.

7. Acceptable Manufacturers:

PRODUCT	ACCEPTABLE MANUFACTURER	ACCEPTABLE SUBSTITUTE
Hinges	Ives	Hager, Stanley, Bommer
Locks and Latches	Schlage	None or equal with BC Locksmith Approval
Cylinders, Keys, and Keying	Schlage Primus	None or equal with BC Locksmith Approval
Exit Devices	Von Duprin	None or equal with BC Locksmith Approval
Door Closers	LCN - installed parallel to door	None or equal with BC Locksmith Approval
OH Stops and Holders	Glynn Johnson	Rixson
Magnetic Hold Opens	LCN	Dor-O-Matic
Wall Stops, Floor Stops, and Flush Bolts	Ives	Glynn Johnson, Trimco
Kick Plates	Ives	Trimco, Quality
Thresholds and Weather Stripping	National Guard	Reese, Zero
Silencers	Ives	Glynn Johnson, Trimco
Key Cabinet	Lund	Key Control

8. Hardware finishes:
   a. Exterior Hinges and rooms that may contain moisture or chemicals (A/C, custodial, bathrooms, kitchens, science labs, storage, etc.) to be Stainless Steel (32D)
   b. Interior Hinges to be Satin Chrome (26D)
   c. Door Closers shall be aluminum
   d. Locks shall be Satin Chrome (26D)
   e. Exit Devices shall be Satin Chrome (26D)
   f. Overhead Holders shall be Satin Chrome (26D)
   g. Flat Goods shall be Satin Chrome (26D) or Stainless Steel (32D)
   h. Thresholds shall be Mill Finish Aluminum.
9. Hinges and pivots:
   a. Exterior hinges on all out swinging doors shall be ball bearing type furnished with non-removable pins (NRP).
   b. Provide ball bearing type at all doors with closers.
   c. Interior butts shall be as listed.
   d. Doors 5′ or less in height shall have two (2) butts. Furnish one (1) additional butt for each 2′6″ in height or fraction thereof.
   e. Dutch Doors: Provide two (2) hinges per leaf.

10. Keying requirements:
    a. All locks and cylinders shall be 11 Pin Schlage Primus key system (level 9) Everest 29 Primus-keyway, all bittings shall be issued by Schlage Lock through the College's locksmith.
    b. Lock cylinders for all projects shall be keyed into the Campus' existing grandmaster key system. Contact the college locksmith for additional information.
    c. Provide Two (2) each change keys per lock and Six (6) each grand master and master keys. Provide Two (2) Control keys for each keyway. All keys to be patent restricted.
    d. For each new construction or renovation project provide 200 Everest 29 Primus key blanks.
    e. All keys to be Primus originals.
11. All exterior (non-entry doors) shall be provided with a drip guard. Provide Pempko or equal.
12. Locksets requirements:
    a. Locksets shall be Heavy Duty ANSI Grade 1 – "D" Series (4000) Commercial Grade 1 Cylindrical type with large format interchangeable cores, unless specified otherwise, in "ND" series, Vandgard, Rhodes design or "L" series 06A design as manufactured by Schlage at exterior doors.
    b. Where required by the College provide programmable units; "AD" series, as manufactured by Schlage or "MiFare Readers". Units shall have the capability of being networked with other electronic locks or operate in a stand-alone mode of operation to be reviewed by the College Access Control Personnel.
13. Exit devices requirements:
    a. All devices shall be Von Duprin 98 Series ANSI Grade 1 in types and functions specified. All devices must be listed under "Panic Hardware" in accident equipment list of Underwriters Laboratories. All labeled doors with "Fire Exit Hardware" must have labels attached and be in strict accordance with Underwriters Laboratories.
    b. All exit devices shall be tested to ANSI/BHMA A156.3 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 1,000,000 cycles must be provided.
    c. All surface strikes shall be roller type and come complete with a plate underneath to prevent movement and shall be provided with a dead-latching feature to prevent latch bolt tampering.
    d. Provide exit devices with large format interchangeable core cylinders.
    e. Exposed vertical riser bars on doors with panic devices shall be specified as stainless steel with stainless steel vertical rod guards. Aluminum shall not be specified or accepted.
14. Door Closer requirements:
    a. All closers shall be LCN 4011/4111 series ANSI Grade 1 having non-ferrous covers, forged steel arms separate valves for adjusting back check, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power. Closers shall be furnished with parallel arm mounted on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Furnish with non-hold open arms unless otherwise indicated. Perpendicular arms shall not be used.
    b. Door closer cylinders shall be of high strength cast iron construction to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
    c. Door closers shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees Fahrenheit to -30 degrees Fahrenheit, without requiring seasonal adjustment of closer speed to properly close

the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with UL 10C.

d. Door closers shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging from particles within the closer. Closers shall have separate and independent screw valve adjustments for latch speed, general speed, and hydraulic back check. Back check shall be properly located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location to protect the door frame and hardware from damage. Pressure relief valves (PRV) are not acceptable.
e. Door closers shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a period of ten (10) years commencing on the Date of Final Completion, and in the event of failure, the manufacture is to promptly repair or replace the defective with no additional cost to the Owner

15. Trim and Plates requirements:
    a. Kick plates, mop plates, and armor plates, shall be Stainless Steel 18 gage minimum, with 32D finish. Kick plates to be 10" high, mop plates to be 4" high. All plates shall be two (2) inches less full width of door.
    b. Provide Kick plates at all back-of-house locations, science labs, libraries, and as coordinated with BCPM review.
    c. Push plates, pull plates, door pulls, and miscellaneous door trim shall be shown in the hardware schedule.
16. Door Stops requirements:
    a. Doorstops shall be furnished for all doors to prevent damage to doors or hardware from striking adjacent walls or fixtures. Wall bumpers to be Ives WS407 series are preferred, but where not practical furnish floor stops Ives FS436/438 series. Where conditions prohibit the use of either wall or floor type stops, furnish surface mounted overhead stops equal to Glynn Johnson, 450 Series.
    b. Provide metal blocking in wall for wall bumpers, see 09 21 00 – Non-Structural Metal Framing and Gypsum Board Assemblies.
17. Door Silencer requirements:
    a. Furnish rubber door silencers equal to Ives SR64 for all new interior hollow metal frames, (2) per pair and (3) per single door frame.
18. Fasteners requirements are indicated:
    a. Hardware as furnished shall conform to published templates generally prepared for machine screw installation.
    b. Furnish each item complete with all screws required for installation. Typically, all exposed screws installation.
    c. Insofar as practical, furnished concealed type fasteners for hardware units that have exposed screws shall be furnished with Phillips flat head screws, finished to match adjacent hardware.
    d. Door closers and exit devices to be installed with closed head through bolts.
19. All doors at interior stairs shall be on hold open connected to Fire Alarm System unless indicated otherwise by Broward College.

08 80 00 | GLAZING

1. The Design Professional shall evaluate Low-E glass options for exterior applications with regards to visible light transmittance and solar heat gain as best suited for the project and the targeted energy saving goals.
2. The Design Professional shall evaluate and include glazing strategies that increase day lighting properties throughout the space and reduce the requirement for electric lighting through the implementation of day lighting sensors, for projects pursuing Sustainable Design certification.
3. Contractor shall submit product data for glazing sealants used inside of the weatherproofing system, including

printed statement of VOC content, for projects pursuing Sustainable Design certification.

4. Exterior products shall be designed and tested to be impact resistant as a system with frame in accordance with the latest edition of the Florida Building Code. Provide Product Approval/NOA Number written verification that the exterior window products provided and installed as a system or assembly meet or exceed requirements of the latest edition of the Florida Building Code and Supplements, for wind resistance of components and cladding with any local code amendment requirements.
5. The Design Professional shall provide Glass type schedule including thicknesses for each size opening and location. Glass types to be reviewed and approved by BCPM.
6. Gray tinted glass is preferred, other types may be considered based on review and approval by BCPM. For existing partial replacement, match existing glass.
7. Provide interior clear glass units typical unless the College requires tinted units.
   a. Doors, classrooms and offices: provide with clear tempered glass vision kits.
8. Where tinted or frosted/opaque exterior glazing units are required, tinting or treatment of units is to be part of an integral laminated process and not applied.
9. Contractor shall provide qualification Data for installers, manufacturers of exterior glass units and sealant testing agency.
10. Safety glazing shall be permanently marked with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
11. Provide sound insulating glass units as required by sound control assembly manufacturer to comply with the STC chart in Division 09.
12. Factory install glazed lights according to requirements of tested assembly to achieve STC rating indicated.
13. Sound insulating glass locations shall be coordinated with the project acoustic requirements.

08 90 00 | LOUVERS AND VENTS

1. Provide Horizontal Storm-Resistant Fixed with Product Approval/NOA, Extruded- Aluminum Louvers. Basis-of-Design Product: Ruskin ELF 6375 DXD Drainable Stationary Louver or equal with interior rain hood option and Kynar finish.
2. Provide Louvers licensed to bear the the AMCA Certified Ratings Seal, based on tests and procedures performed in accordance with AMCA Publication 511 and complying with the requirements of the AMCA Certified Ratings Program, in addition to the following:
   a. Provide Louvers AMCA 540 and AMCA 550 Listed.
   b. Provide Intake Louvers designed to allow maximum of 0.01 oz/sq ft water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.
3. Provide Stainless Steel Louver Screens (Insect Screening) at the interior face of each exterior louver, secured to Louver Frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c. and with Louver Screen Frames fabricated with mitered corners to louver sizes indicated.
4. Provide Uninsulated, Blank-Off Panels: Metal sheet attached to back of louver. Where required.
   a. Aluminum sheet for aluminum louvers, not less than 0.050-inch nominal thickness.
   b. Panel Finish: Same type of finish applied to louvers, but black color.
   c. Attach blank-off panels with sheet metal screws, continuously seal all edges to create a waterproof seal.

09 00 50 | GENERAL MATERIAL AND FINISH STANDARDS

1. In general, all materials shall be assessed for long range, life-cycle cost analysis for projects pursuing Sustainable or Green Certification.
2. The Design Professional shall coordinate all color and material color selections with the BCPM and BC Facilities Planner.
3. A material and finish schedule and sample board showing color code/name, reference # as illustrated in plans, shall be provided for interior finishes, such as paint, vinyl, base, carpet, tile, bathroom partitions, etc., as well as exterior finishes, such as paint, glazing, etc.
4. Provide a complete Finish Schedule, Finish Plans and Elevations (as required by the complexity of the project) in the Contract Documents for BCPM review and approval prior to Bidding.
5. A/E to require BCPM review and approval of Submittals for Samples of all finishes and finishing material, and when requested by BCPM, review and approval of related Shop Drawings. . For any nonstandard finishes a field mock-up (minimum 4' x 4' with each texture finish) is required. Location to be coordinated with BCPM.
6. Vinyl wall coverings shall not be specified for any location without written approval from BCPM.

09 21 00 | NON-STRUCTURAL METAL FRAMING AND GYPSUM BOARD ASSEMBLIES

1. The Design Professional shall indicate interior framing systems (supports for partition walls, framed soffits, furring, etc.) and interior suspension systems (supports for ceilings, suspended soffits, etc.).
2. Fire test-response characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
3. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf and L/360 at 5 psf at tile or veneer assemblies and systems to receive water resistant gypsum board or backer board.
   a. Corrosion Protection Coating Designation: Provide G40 or equivalent in accordance with AISI S220. Provide G60 for materials in contact with concrete or masonry.
4. Metal Blocking is preferred over wood blocking. Install mechanically fastened steel channel or sheet blocking for support of finishes, fixtures, specialty items, door stops, accessories and trim.
5. Structural framing, Loadbearing Studs, Exterior Walls, or Partitions exceeding 15'-6" in height: Require Delegated engineering and see Section 05 40 00 – Cold-Formed Metal Framing.
6. For STC-Rated Assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
7. Provide two beads of acoustical sealant under bottom tracks of STC-Rated Assemblies.
8. Provide Floor Plans that indicate STC-Rating requirements (as required by the complexity of the project) in the Contract Documents for BCPM review and approval prior to Bidding.
9. A/E to provide single or composite walls, floor-ceiling and roof-ceiling assemblies that provide the following sound transmission class (STC) ratings when separating a core learning space from an adjacent space:

SOUND TRANSMISSION CLASS (STC) RATINGS														
	AUDITORIUM	MUSIC ROOM	CLASSROOM	CONFERENCE ROOM	CORRIDORS / STARIS	DINING AREAS	EXTERIOR	RESTROOMS	GYMNASIUM	KITCHEN	LABORATORY	MECHANICAL	LIBRARY	OFFICE
AUDITORIUM	60	60	60	60	60	60	60	60	60	60	60	60	60	60
MUSIC ROOM		60	60	60	60	60	60	60	60	60	60	60	60	60
CLASSROOM			50	50	50	50	50	50	60	60	50	60	60	50
CONFERENCE ROOM				50	50	50	50	50	60	50	50	50	60	50
CORRIDORS / STAIRS					45	50	35	45	45	45	50	45	60	45
DINING AREAS						50	45	45	45	45	50	45	60	50
EXTERIOR							--	35	35	35	50	35	60	50
RESTROOMS								35	35	35	50	35	60	50
GYMNASIUM									45	45	50	45	60	50
KITCHEN										35	50	45	60	50
LABORATORY											50	50	60	50
MECHANICAL												35	60	50
LIBRARY													60	50
OFFICE														45

Doors and Glazed Openings:

1. Walls with a STC rating of 45 or less require doors with a STC rating of 25.
2. Walls with a STC rating of 50 or less require doors with a STC rating of 30.
3. Walls with a STC rating of 60 or less require doors with a STC rating of 40.
4. Entry doors across a corridor should be staggered to minimize noise transmission.
5. Exterior glazed opening shall have a minimum STC rating of 35.

Adjacencies:

1. Do not locate mechanical equipment rooms, restrooms, music rooms, gymnasiums, or any other noisy space adjacent to a classroom or core learning space.
2. In new construction, do not locate gymnasiums, dance studios, or other high-impact activities above core learning spaces.

10. Impact Insulation Class (IIC) is a rating for the ability of a floor-ceiling assembly to block impact/structure borne noise from transmitting to the space below. IIC ratings for floor- ceiling assemblies above core learning spaces should be between IIC-45 to IIC-50 (measured without carpeting on the floor).
11. In existing facilities IIC-65-70 (depending on the volume of the space below) is recommended if gymnasia, dance studios or other high floor impact activities are located above core learning spaces.
12. All gypsum board shall be a minimum of 5/8 inches thick.

13. Full height approved high moisture resistance panels shall be used in the following rooms:
    a. Janitor closets
    b. Wet laboratory areas
    c. Drinking fountains
    d. Mechanical rooms
    e. Restrooms
    f. Kitchens
    g. Showers
    h. Bathrooms
    i. Dishwashing areas.
14. Finish gypsum board as follows:
    a. Level 5 at walls and ceilings to receive gloss paint finish, wallcovering, and specialty finishes.
    b. Level 4 at walls and ceilings to receive walls and ceilings to receive paint finish, typical applications.
    c. Level 3 at back-of-house and utility areas.
    d. Level 2 behind cabinetry and on backing board to receive tile finish.
    e. Level 1 at fire-resistance-rated wall areas above finished ceilings.

09 24 00 | PORTLAND CEMENT PLASTER (STUCCO)

1. Technical Services Information Bureau (TSIB Org.) to be used as the reference standard or stucco finishes.
2. Product Data for each product specified is required to be submitted.
3. Material Certificates shall be signed by the manufacturer for each kind of plaster aggregate certifying that the materials comply with specifications.
4. All cementitious materials are required to be delivered to the Project site in their original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number and are further required to be stored inside, under cover, and dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.
5. The contractor shall comply with requirements of the referenced plaster application standards and the recommendations of the plaster manufacturer for environmental conditions before, during, and after plaster application including requiring that plaster not be applied when the ambient temperature is below 40 degrees F.
6. Architect to require a mock-up (based on the size of the installation) panel for review and approval prior to installation that shows each phase of installation.
7. Metal ceiling supports for suspended and furred ceilings and soffits shall be sized to comply with ASTM C 1063. Contractor to provide specialty engineering signed and sealed drawings for any exterior metal framing work. See Section 05 40 00 – Cold-Formed Metal Framing.
8. Trim pieces inclusive of corner beads, casing beads, control joints and expansion joints shall be indicated to be fabricated from high-impact PVC installed in bed of sealant with sealed joints.
9. Architect / Engineer to specify a design that minimizes the use of plastic accessories. Metal accessories will not be allowed unless otherwise approved by the BCPM.
10. Job-Mixed Finish-Coat Cements shall be Portland cement, ASTM C 150, Type I, cement color gray.
11. Lime shall be specified as special non air-entraining hydrated lime for finishing purposes, ASTM C 206, Type S; or

special non air-entraining hydrated lime for masonry purposes, ASTM C 207, Type S.

12. Sand Aggregate for Base Coats shall meet ASTM C 897.
13. Aggregate for Finish Coats is to comply with ASTM C 897 system and to be manufactured of natural sand.
14. Fiber for the Base and Scratch Coat only shall be specified as alkaline-resistant glass or polypropylene fine fibers 10 mil maximum width, 1/2 inch maximum long, free of contaminants, manufactured for use in Portland cement plaster.
15. The water for mixing shall be potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
16. A non-re-emulsifiable acrylic emulsion-type bonding admixture shall be used for the base coat in two-coat. Approved products include:
    a. Thoroseal Acryl 60, manufactured by Harris Specialties Chemicals, Inc.
    b. Xycrylic, manufactured by Xypex Chemical Corp.
    c. Sika Latex manufactured by Sika Chemical Corp.
17. Bonding agents applied to surface and left beyond manufacturer's time recommendation shall be removed and reapplied.
18. The mix shall be compliance with ASTM C 926 for base-and finish-coat mixes as applicable to plaster bases, materials, and other requirements indicated, except that plastic cement and masonry cement are not permitted.
19. Base Coat Mixes and Compositions shall be as listed below for proportion of materials for respective coats in parts by volume for cementitious materials and in parts by volume of aggregate per sum of cementitious materials to comply with the following for each method of application and plaster base indicated. (Mix proportions may be adjusted within limits specified to attain workability.)
20. Fiber Content shall be as follows: Add fiber to brown coat of 3-coat mixes after ingredients have mixed for at least 2 minutes. Comply with fiber manufacturer's written instructions, but do not exceed 1 lb/cu. ft. of cementitious materials. Reduce aggregate quantities accordingly to maintain workability.
21. Three Coat Work Over Metal Lath (limited to protected horizontal applications) shall be as follows: Base-coat proportions as indicated below (comply with ASTM C-926):
    a. Scratch Coat: 1 part Portland Cement, 0 to 3/4 parts lime, and 2-1/2 to 4 parts sand.
    b. Brown Coat: 1 part Portland Cement, 0 to 3/4 parts lime, and 3 to 5 parts sand.
    c. Finish Coat: 1 part Portland Cement, 3/4 to 1 1/2 parts lime, and 3 parts sand.
    d. For fire rated walls refer to FBC.
22. Two-Coat Work over Concrete Unit Masonry shall be as follows: Base coat proportions 1 part Portland cement, 3/4 to 1-1/2 parts lime, and 3 to 4 parts sand. Water to be mixed with bonding admixture in proportion as recommended by admixture manufacturer. For fire rated walls refer to FBC.
23. Job-Mixed Finish Coats shall be as follows: Proportion materials for finish coats in parts by volume for cementitious materials and parts by volume of aggregates per sum of cementitious materials: 1 part Portland Cement, 3/4 to 1-1/2 parts lime, 3 parts sand.
24. Mechanically mix cementitious and aggregate materials for plasters shall comply with applicable referenced application standard and with recommendations of plaster manufacturer.
25. Metal lath over concrete or concrete unit masonry is not permitted, Provide direct applied cement plaster.
26. Metal Lath and Furring shall be specified only at surfaces with framing and sheathing at protected horizontal surfaces (soffits): Comply with EMLA 920, "Guide Specifications for Metal Lathing and Furring," and with the requirements of ASTM C 1063.

27. The installation of supplementary framing, blocking, and bracing at terminations in work and for support of fixtures, equipment services, heavy trim and similar work is to comply with details indicated or, if not otherwise indicated, to comply with applicable written instructions of lath and furring manufacturer.
28. Where lathing and metal support system abuts building structure horizontally and where a partition or wall abuts an overhead structure, the design shall be sufficiently isolated from structural movement to prevent transfer of loading from building structure. Further slip-or cushion-type joints to absorb deflections but maintain lateral support shall be indicated.
29. Both sides of control joints shall be framed independently so the detail does not bridge joints with furring and lathing or accessories.
30. Contractor shall clean plaster bases and substrates for direct application of plaster, removing loose material and substances that may impair the Work.
31. Contractor shall immediately before plastering, dampen the concrete and concrete unit masonry surfaces indicated for direct plaster application. The contractor must determine and apply the amount of moisture and degree of saturation that will result in optimum suction for plastering.
32. Control joints shall comply with the following criteria unless otherwise indicated by the A/E:
    a. Provide sealed pre-manufactured connector strips or interceptors at all junctions of screeds. Butt joints acceptable.
    b. Where an expansion or contraction joint occurs in surface of construction directly behind plaster membrane.
    c. Distance between Control Joints: Not to exceed 18 feet in either direction or a length- to-width ratio 2-1/2 to 1.
    d. Vertical Surfaces, not more than 144 sq. ft. in area.
    e. Horizontal Surfaces, such as suspended ceilings (soffits), not more than 100 sq. ft. in area.
    f. Where plaster panel sizes or dimensions change, it should be specified to extend joints full width or height of plaster membrane.
    g. Provide prefabricated expansion joints of 2-piece design (1/4 inch joint width for interior work, 3/8 inch for exterior).
    h. Channel screeds (reveals): Where ends of channel sections meet, set in bead of sealant; set all splice plates in mastic.
33. Contractor shall apply plaster materials (including requirements to moist-cure plaster base and finish coats), composition, and mixes to comply with ASTM C 926 Plaster Application Standard, including written instructions for time between coats and curing in "Annex A2 Design Considerations".
34. It is prohibited to use materials that are caked, lumpy, dirty, or contaminated by foreign materials. No re-tempering acceptable.
35. Flat Surface Tolerances shall not deviate more than plus or minus 1/8 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed at any location on surface.
36. Contractor shall sequence plaster application with installation and protection of other work so that neither will be damaged by installation of other.
37. The following number of coats and thicknesses are required for 3-coat work on metal lath bases at horizontal surfaces:
    a. 1st (scratch) coat 1/4 inch
    b. 2nd (brown) coat 1/4 inch
    c. 3rd (finish) coat 1/8 inch
    d. Total (minimum) 5/8 inch

09 30 00 | TILE

1. The following areas are to receive tile at wall surfaces only:
   a. Drinking fountains.
   b. Wet walls at restrooms: full height.
   c. Showers: entire wall perimeter at full height.
   d. Janitor's closet: Refer to 06 83 16 – Fiberglass Reinforced Paneling.
2. The Design Professional shall determine preferences for tile finishes from conferences with BCPM and BC Facilities Planner.
3. Refer to Appendix 09 02 - Restroom Standards.
4. Architect to require a mock-up for each type of tile (based on the size of the installation) for review and approval prior to installation, incorporating all components specified for the location.
5. Finish schedule shall indicate type and size at each condition.
6. Trim Units and Special Shapes: Specify all necessary trim and accessory items for a complete installation, including:
   a. External Corners: Provide metal trim accessory.
   b. Internal Corners: Provide metal trim accessory or color matched silicone sealant.
   c. No visible cut tile edges shall be permitted
   d. Open Edges: Provide tile or metal trim accessory bullnose shape at top of non-full height wall applications.
7. Grout materials:
   a. Provide Polymer-Modified Tile Grout: ANSI A118.7, color as selected.
   b. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable, color as selected. Use at showers and other areas based on approval from BCPM.

09 51 23 | ACOUSTICAL TILE CEILINGS

1. Acoustical Tile Ceilings Tolerances shall be as follow:
   a. Free of irregularities and level to within 1/8-inch in 12 feet
   b. Maximum Deflection: 1/360 of span
2. Acceptable Manufacturers: Armstrong World Industries, USG Corp., Chicago Metallic Corp., Rockfon or equal.
3. Acoustical Tile Ceilings Suspension System shall be in compliance with ASTM C635, intermediate duty, exposed Tee system for 24" x 24" lay-in acoustical ceiling tiles, with white factory applied baked enamel finished grid, stabilizer bars, clips, splices and matching edge moldings. Refer to Appendix 09 01. Provide from same manufacturer as for acoustical ceiling tiles.
4. Provide Acoustical Ceiling Tile as follows. Refer to Appendix 09 01.
   a. Applications: Typical areas.
      i. Armstrong-Dune or approved equal
      ii. NRC: 0.50
      iii. Edge detail: Square, unless otherwise approved by BCPM
      iv. Thickness: 5/8-inch
      v. Size: 24" x 24"
   b. Applications: Classrooms, Offices, Conference rooms and areas requiring higher sound absorption.
      i. Armstrong-Ultima or approved equal
      ii. NRC: 0.75

iii. Edge detail: Square, unless otherwise approved by BCPM.
iv. Thickness: ¾ inch.
v. Size: 24" x 24".

c. Applications: Provide non sag / humidity resistant, washable, acoustical ceiling tile at food service areas restrooms, janitor's closet or other high moisture areas as applicable.
i. Armstrong - Optima Health Zone or approved equal.
ii. NRC: 0.95
iii. Edge detail: Square, unless otherwise approved by BCPM.
iv. Thickness: 1 inch
v. Size: 24" x 24".
vi. Texture: smooth

09 60 00 | FLOORING - GENERAL REQUIREMENTS

1. Preparation and Testing requirements of concrete substrates for floors to receive the following types of floor coverings:
   a. Resilient tile and sheet flooring
   b. Fluid-applied Resinous flooring
   c. Carpet
   d. Thin-set tile
2. Testing:
   a. Perform the following tests, unless otherwise indicated or required by flooring manufacturer:
      i. Moisture vapor emission testing in accordance with ASTM F1869; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet.
      ii. Internal relative humidity testing in accordance with ASTM F2170; in same locations as moisture vapor emission tests.
      iii. Alkalinity (pH) testing in accordance with ASTM F710; in same locations as moisture vapor emission tests.
      iv. Adhesive bond and compatibility test; comply with requirements and recommendations of floor covering manufacturer.
   b. If test results are not within limits recommended by flooring manufacturer and adhesive materials manufacturer (if applicable) follow manufacturer's remediation procedures before proceeding with installation.
3. Preparation:
   a. Remove sub-floor ridges and bumps. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching or underlayment compound.
   b. Confirm that interior building floor slabs meet the following standards for flatness and levelness as determined by FF/FL test procedures per ASTM E1155.
      i. Overall Value: FF 35 / FL 25
      ii. Local Value: FF 21 / FL 15
   c. Provide Cementitious Self-leveling underlayment if required as remediation treatment.

1. The following areas shall receive resilient flooring:
    a. Storage rooms
    b. Corridors
    c. Science Labs
    d. Break rooms/lounge areas
    e. Health science areas (full sheet roll goods)
2. IT, data and electric rooms; provide floor coverings with static-control properties in compliance with ASTM F 150 with 100-V applied voltage.
3. Vinyl Composition Tile shall be in compliance with ASTM F 1066, Class 2 - Through pattern tile; 12" x 12" size, 3/32-inch thick; marbleized design. Acceptable Manufacturers: Armstrong, and Tarkett Flooring or approved equal.
    a. Applications: Storage rooms and back of house areas.
4. Luxury Vinyl Tile (LVT): Comply with ASTM F1700.
    a. Applications: Preferred for all other areas to receive resilient flooring.
    b. Acceptable Manufacturers: Milliken, Interface, or approved equal.
    c. Wear Layer Thickness:
        i. Typical applications: 0.020 inch, minimum.
        ii. Science labs, elevators, and high traffic areas: 0.030 inch, minimum.
5. Accessories to include resilient transition strips for transition conditions between resilient flooring and carpet.
6. Preparation and testing requirements for Resilient Flooring:
    a. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
    b. Concrete substrates: prepare according to ASTM F 710. Test in accordance with 09 60 00 – Flooring – General Requirements.
7. Preparation: Remove sub-floor ridges and bumps. Fill low spots, cracks joints, holes, and other defects with subfloor filler. Verify flatness and levelness measurements in accordance with 09 60 00 – Flooring – General Requirements.
8. Installation: Tightly adhere resilient flooring to sub-floor without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand roll at perimeter of each covered area to assure adhesion.
9. Prohibit Traffic on floor finish for 48 hours after installation.
10. Clean floor surfaces in accordance with manufacturer's instructions.
11. Seal and wax VCT flooring in accordance with manufacturer's written instructions.
12. Provide extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
    a. Floor Tile: Furnish 1 box for every 100 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.
13. Provide Wall Base in compliance with ASTM F 1861, Type TS rubber, vulcanized thermoset.
    a. Basis of Design: Tarkett Traditional Wall Base, Colors: TA6 Bedrock CG, 20 Charcoal WG, 18 Navy Blue, or approved equals from Roppe.
14. Provide Cove base (with top-set toe) at areas receiving resilient flooring and Straight (toeless) at areas to receive carpet with minimum thickness of 0.125 inch, 4 inches in height, smooth surface and pre-molded outside and inside

corners.

15. Provide Resilient Stair Treads in compliance with ASTM F2169. Acceptable Manufacturers: Tarkett, Mannington, and Roppe Corporation.
16. Tread material: Rubber, Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees with Lengths and depths to fit each stair tread in one piece.

09 67 23 | RESINOUS FLOORING

1. Applications: Provide resinous flooring at all janitor closets, public restrooms toilet and shower rooms, and in other locations as may be required by the College. See Appendix 09 02 – Restroom Standards for Basis of Design and details.
2. Contractor shall obtain primary resinous flooring materials, including primers, resins, hardening agents, and sealing or finish coats through one source from a single manufacturer.
3. Contractor shall obtain secondary resinous flooring materials including patching and fill materials, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.
4. Contractor shall submit Product Data for adhesives and sealants, including printed statement of VOC content for projects pursuing Sustainable certification.
5. Provide a Mock-up for review and approval prior to installation to serve as basis for evaluation of texture, slip resistance, and workmanship.
6. Flooring System Components: Resinous floor surfacing system consisting of primer, body coat(s) including resin, hardener, aggregates, and colorants (if any), and sealing or finish coat(s).
7. Project Conditions for Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminates incompatible with resinous flooring.
    a. Comply with ASTM C811 requirements unless manufacturer's published instructions are more stringent.
    b. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's published recommendations.
    c. Test for moisture and alkalinity (pH) in accordance with 09 60 00.
8. The application of components of resinous flooring system shall be according to manufacturer's published instructions to produce a uniform monolithic wearing surface of ¼ inch minimum thickness.
    a. Slope to Drain: Provide resinous flooring with minimum 1/8-inch per slope minimum slope to floor drains.
9. Provide Integral 6 inch high Cove Base with rounded internal and external corners Install cove base according to manufacturer's published instructions.
    a. Provide aluminum trim accessory to terminate or transition the top of base.
    b. Basis of Design:
        i. At transition to wall tile: Schluter Schiene
        ii. At termination with no wall tile: Schluter Jolly.
10. Resinous flooring shall be cleaned not more than four (4) days before dates scheduled for inspections intended to establish date of Substantial Completion. Use cleaning materials and procedures recommended in writing by resinous flooring manufacturer.

09 68 13 | TILE CARPETING

1. Provide modular, tufted textured loop carpet tile for office areas, computer labs, and other spaces as required by Broward College.
2. Delivery, storage and handling shall be in compliance with CRI 104.
3. Field conditions shall be in compliance with CRI 104 for temperature, humidity, and ventilation limitations. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
4. Standards for Carpet Tile:
   a. Color and pattern: As selected by Architect and approved by Broward College
   b. Fiber Type: Post-Consumer content type 6 nylon
   c. Pile Characteristic: Tufted Textured Loop pile
   d. Pile Thickness: 0.093 inch for finished carpet tile according to ASTM D 6859
   e. Primary Backing/Back coating: Manufacturer's Standard GlasBac® Tile or equal
   f. Applied Soil-Resistance Treatment: Manufacturer's standard material: Protekt²® or equal
   g. Antimicrobial Treatment: Manufacturer's standard material
5. Provide adhesives having VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
6. Concrete slabs shall comply with ASTM F 710 and the following:
   a. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests in accordance with 09 60 00 – Flooring – General Requirements. If test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer, follow manufacturer's recommended remediation procedures. Proceed with installation only after unsatisfactory conditions have been corrected.
7. Floor preparation requirements:
   a. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
   b. Use trowel able leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
   c. Verify flatness and levelness measurements in accordance with 09 60 00 – Flooring – General requirements.
   d. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.
8. Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.

09 91 00 | PAINTING

1. Interior paints and coatings products shall be in compliance with VOC limits indicated by the latest edition of the applicable Sustainable Rating System Reference Guide for projects pursuing a Sustainable Rating certification.
2. Contractor shall submit product data for paints and coatings, including printed statement of VOC content for all projects.
3. The Design Professional shall list each product by name and indicate total thickness of paint, per coat, by "dry mil"

or "wet mil" thickness (according to which is recommended by the paint manufacturer) for each application. **(MPI system reference will not be accepted.)**

4. Project conditions: Do not paint in rain, fog, mist, or when relative humidity exceeds 85 percent, or to damp or wet surfaces.
5. Paint materials not displaying manufacturer's identification as a standard, best grade product will not be accepted.
6. Provide pure, non-fading, applicable color pigment types to suit substrates and service life specified.
7. Surface preparation requirements: Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly painted surfaces.
    a. Ferrous Metals: Clean ferrous surfaces that are not galvanized or shop-coated of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning
    b. Galvanized Surfaces: Clean per SSPC-SP1 using detergent and water or a degreasing cleaner then prime as required.
    c. Aluminum Surfaces: Remove all oil, grease, dirt, oxide and other foreign material by cleaning Per SSPC-SP1 Using detergent and water or a degreasing cleaner then prime as required.
8. Application requirements: Provide additional coats when undercoats, stains or other conditions show through the final coat or paint, until paint film is of uniform finish, color and appearance.
    a. Access Panels and Removable or Hinged Covers: Paint backsides of these items to match exposed finished surfaces.
    b. Prime Coats: Apply prime coat to surfaces required to be painted (or finished) that have not received a factory-prime coat.
        i. Re-Coat primed or sealed surfaces where there is evidence of "suction spots" or unsealed areas in prime coat to insure no "bleed-through" of the finish coat, or other defects due to insufficient priming or sealing.
9. Requirements for pigmented (opaque) finishes: Completely cover to provide opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be accepted
10. The completed work shall match approved samples for color, texture and coverage.
11. Provide Basis of Design products from preferred manufacturer: Sherwin Williams. Subject to compliance with requirements other acceptable manufacturers include the following:
    a. Benjamin Moore and Co.
    b. PPG Industries
12. Interior Paint Systems
    a. Latex System: Vinyl Acrylic, Low Odor – Zero VOC Finish
        i. Basis of Design Product: Sherwin-Williams ProMar 200 Zero VOC Interior Latex.
    b. Hi-Performance Latex System: 100% Acrylic, Low Odor – Zero VOC Finish
        i. Basis of Design Product: Sherwin-Williams ProMar 200 HP Zero VOC Interior Latex.
    c. Epoxy Wall System: Pre-Catalyzed, Water Based
        i. Basis of Design Product: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy.
    d. Dry Fall System: Waterborne
        i. Basis of Design Product: Sherwin-Williams Waterborne Acrylic Dryfall.
    e. Urethane System: Water Based
        i. Basis of Design Product: Pro Industrial WB Alkyd Urethane.

f. Epoxy Floor System: Two-component Polyamine Water Based Epoxy Floor coating
    i. Basis of Design Product: Sherwin-Williams ArmorSeal 8100.
g. Primers: As recommended by top coat manufacturer for specific substrate.

13. Interior Paint Schedule by substrate:
    a. Concrete - (Interior Walls & Ceilings, Poured Concrete, Precast Concrete, Cement board, Tilt-Up, Cast-In-Place) including PLASTER - (Walls, Ceilings)
        i. Latex System
            1. Semi-Gloss Finish for walls
            2. Flat Finish for ceilings
        ii. Epoxy Wall System: For high traffic or high abuse areas
            1. Semi -Gloss Finish for walls
    b. Concrete - (Ceilings): For large interior concrete ceiling areas such as parking garages:
        i. Dryfall System
            1. Flat Finish
    c. Masonry - (Interior CMU - Concrete, Split Face, Scored, Smooth, High Density, Low Density, Fluted)
        i. Latex System
            1. Semi-Gloss Finish
    d. Metal - (Aluminum, Galvanized): For metal doors and frames.
        i. Hi-Performance Latex System
            1. Semi-Gloss Finish
        ii. Urethane System: For high traffic or high abuse areas
            1. Semi-Gloss Finish
    e. Metal: For existing field painted handrails
        i. Urethane System
            1. Gloss Finish
    f. Metal - (Galvanized); For Ceilings, Duct work
        i. Dryfall System (for use at 10'-0" A.F.F. min)
            1. Flat Finish
        ii. Primer: Optional, if the Ceilings - Structural Steel, Joists, Trusses, and Beams are already primed. Contractor shall check for adhesion and compatibility prior to painting.
            1. Spot prime any bare areas with S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series or equal.
        iii. Verify elevation per mfg. requirements.
    g. Metal - (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous & Ornamental Iron, Structural Iron, Ferrous Metal)
        i. HI-Performance Latex System
            1. Flat Finish
    h. Wood - (Trim): For special applications as approved by Broward College.
        i. Latex System: For equipment rooms and janitor closets only
            1. Semi - Gloss Finish
        ii. Stain and Varnish System: For Wood Doors

1. Satin Finish

i. Drywall - (Walls & Ceilings): For Classroom, Offices, storage areas and similar.
   i. Latex System:
      1. Semi-Gloss Finish for equipment rooms and janitor closets only
      2. Egg-Shell Finish
      3. Flat Finish for ceilings only
   ii. Epoxy Wall System: For Hallways, high traffic and high abuse areas.
      1. Semi -Gloss Finish or
      2. Egg-Shell Finish:

j. Concrete - (Floors): Mechanical, exterior electrical rooms and similar applications. Add sand/paint for all utility rooms, exterior accessible mechanical/electrical rooms.
   i. Epoxy Floor System
      1. Low Luster Finish

14. Exterior Paint Systems
   a. Exterior Coating System
      i. Basis of Design:
         1. Previously painted concrete surfaces: 1st Coat: Sherwin Williams Loxon Conditioner, A24-100 Series. (Coverage: 200-300 sq ft/gal). 2nd & 3rd Coats: Sherwin Williams Loxon XP Waterproofing System, A24 Series. (14.0 to 18.0 wet mils; 6.4 to 8.3 DFT mils per coat)
         2. New/ bare concrete surfaces: 1st & 2nd Coats: Sherwin Williams Loxon XP Waterproofing System, A24 Series. (14.0 to 18.0 wet mils; 6.4 to 8.3 DFT mils per coat)
   b. Textured Exterior Coating System
      i. Basis of Design:
         1. 1st Coat: Sherwin Williams Loxon Concrete & Masonry Primer Sealer (3.2 mils DFT minimum).
         2. 2nd Coat: Sherwin Williams ConFlex UltraCrete Acrylic Texture Coating (13.0 mils mils DFT minimum).
         3. 3rd and 4th Coats: Sherwin Williams Duration Exterior Acrylic (2.6 mils DFT minimum, each coat).
   c. Exterior Latex System: Acrylic
      i. Basis of Design Product: Sherwin-Williams Duration Exterior Acrylic.
   d. Urethane System: Water Based
      i. Basis of Design Product: Pro Industrial WB Alkyd Urethane.
   e. Primers: As recommended by top coat manufacturer for specific substrate.
15. Exterior Paint Schedule by Substrate:
   a. Concrete - (Stucco, Tilt-up, Precast, and Cast-in-place)
      i. Exterior Coating System - Stucco, Precast, and Cast-in-place
         1. Flat Finish
      ii. Textured Exterior Coating System - Tilt-up
         1. Satin Finish
   b. Masonry (Concrete Masonry Units [CMU]- Cinder or Concrete Block)
      i. Exterior Latex System
         1. Flat Finish

c. Metals:
    i. Urethane System
        1. Semi-Gloss Finish For metal doors and frames
        2. Gloss Finish: For existing field painted handrails

10 11 00 | VISUAL DISPLAY SURFACES

1. The following items to be furnished and installed by the general contractor: Marker boards and Tack boards.
2. Porcelain-Enamel Marker-board Assembly: balanced, high-pressure, factory- laminated Marker board assembly of 3-ply construction consisting of backing sheet, core material, and porcelain-enamel coated steel face sheet with low-gloss finish.
   a. Provide Marker tray.
   b. Warranty for Porcelain-Enamel face sheets: Life of the building; Failures include:
      i. Surfaces lose original writing and erasing qualities
      ii. Surfaces exhibit crazing, cracking, or flaking.
3. Tack board Assembly: Composition cork factory laminated to backing.
4. Joints: Hidden spline.
5. Provide structural supports and blocking to suit project conditions.
6. Review locations of Tack boards and Marker boards with BCPM for approval.
7. Refer to Appendix 01 03 Audio Visual Standards for coordination of Marker board locations in Classrooms and Conference rooms. Marker board surfaces should be accessible when projection screen is lowered, board length to extend past both sides of screen.

10 14 00 | SIGNAGE

1. Refer to the Broward College Sign Standards Manual for all interior and exterior signage.
2. Room signage: Refer to the Broward College Sign Standards Manual.
   a. The construction documents shall indicate room identification signage for each interior room that includes the building number and room number and any applicable suffice (i.e., "A", "B", etc.). Coordinate requirements with BC Project Manager and BC Facilities Planner.
3. Emergency Evacuation signage: Refer to the Broward College Sign Standards Manual.
   a. Allow for one Evacuation Map sign in each space with an occupant load of 6 or more and not having a door open directly to the exterior. Confirm quantity and locations with BC Project Manager and BC Fire Marshall.
4. Building Identification signage: Refer to the Broward College Sign Standards Manual.
   a. Provide for each Building exterior to identify the building name and building number.
5. Maximum Capacity signage: Provide for all rooms that exceed 50 occupants, such as Classrooms and Multi-purpose spaces.
6. Signage shall be in compliance with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction. Interior Code Signage: Provide signage as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:
   a. Illuminated Exit Signs.
   b. Fire Doors.
   c. Room Capacity.
   d. Elevator Signs.
   e. Stairway Identification.
   f. Signs for Accessible Spaces.

10 21 13 | TOILET COMPARTMENTS

1. Provide solid plastic toilet compartments and urinal partitions, Basis of Design products by Scranton Products, or equal as approved by Broward College. See Appendix 09 02 – Restroom Standards for details.
2. Provide doors, panels and pilasters, floor-mounted headrail-braced, as follows:
   a. High density polyethylene (HDPE), single thickness panel. Waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.
   b. 1 inch thick with edges rounded to 1/4 inch radius.
   c. Recycled content: Minimum 25 percent or as required by project.
   d. Color: Charcoal Gray unless otherwise approved by Broward College Facilities Planner.
3. Provide hardware as follows:
   a. Hinges: 8 inches long, fabricated from heavy-duty extruded aluminum with bright dip anodized finish, wrap-around flanges, adjustable on 30-degree increments, through bolted to doors and pilasters with stainless steel, Torx head sex bolts. Hinges operate on field-adjustable nylon cams, field adjustable in 30 degree increments.
   b. Door Strike and Keeper: 6 inches long, fabricate from heavy-duty extruded aluminum with bright dip anodized finish, with wrap-around flanges secured to pilasters with stainless steel tamper resistant Torx head sex bolts. Bumper: Extruded black vinyl.Latch and Housing: Heavy-duty extruded aluminum surface mounted unit designed for emergency access.
   c. Coat Hook/Bumper required at all stalls. Combination type, chrome plated Zamak, sized to prevent door from hitting mounted accessories.
   d. Door Pulls: Chrome plated Zamak or manufacturer's standard unit for outswinging doors.
4. Required components:
   a. Doors and Dividing Panels: 55 inches high, mounted 14 inches above finished floor.
   b. Pilasters: 82 inches high, fastened to pilaster sleeves with stainless steel tamper resistant Torx head sex bolt.
   c. Pilaster Sleeves: 3 inches high, one-piece molded HDPE, secured to pilaster with stainless steel tamper resistant Torx head sex bolt.
   d. Privacy Strips: Interlocking half lap design of pilasters and panels to eliminate sight gap between doors and pilasters.
   e. Wall Brackets: 54 inches long, heavy-duty aluminum, bright dip anodized finish, fastened to pilasters and panels with stainless steel tamper resistant Torx head sex bolts. Provide continuous metal brackets at all panel joints for privacy.
   f. Headrail: Heavy-duty extruded aluminum, anti-grip design, clear anodized finish, fastened to headrail bracket with stainless steel tamper resistant Torx head sex bolt and at top of pilaster with stainless steel tamper resistant Torx head screws.
   g. Headrail Brackets: 20 gage stainless steel, satin finish, secured to wall with stainless steel tamper resistant Torx head screws.
5. Provide, unless otherwise directed, 24-inch wide in-swinging doors for ordinary toilet stalls and 32-inch wide (clear opening) out-swinging doors at stalls equipped for use by the handicapped.

10 26 00 | WALL AND DOOR PROTECTION

1. Provide corner guards in open spaces, corridors, hallways, and classrooms. Refer to Appendix 10 01 for details.
2. Corner guard assembly: Continuous vinyl cover installed over continuous vinyl retainer; designed to spring back when hit.
3. Provide wall protection in classrooms. Refer to Appendix 10 01 for details.
4. Wall protection assembly: Rigid vinyl, 0.040 (1mm) thick, with matching vinyl trim pieces.
5. Review corner guard and wall protection locations and applications with BCPM for approval.

10 28 00 | TOILET, BATH AND JANITORIAL ACCESSORIES

1. All toilet accessory items (including those to be provided by the College and contractor installed) contractor shall confirm full-functionality and dimensional fit. See Appendix 09 02 – Restroom Standards for details.
2. Clearances shall comply with the requirements of the Florida Accessibility Code and as follows:
   a. Provide 36-inch minimum clearance width in all toilet compartments
   b. Provide 1'-6" minimum from centerline of lavatory to nearest adjacent wall
3. Bobrick shall be listed as the preferred manufacturer, or approved equivalent.
4. Provide fixed, non-tilted, stainless steel mirror units at handicap accessible lavatories.
5. Contractor shall furnish and install the following accessories:
   a. Grab bars: configuration and length to be noted in drawings
   b. Sanitary Napkin Disposals
   c. Mirrors
   d. Waste receptacles, wall-mounted, non-recessed type only.
   e. Baby Changing Stations
   f. Door Hooks
6. Owner-Provided/Contractor installed Equipment, see Appendix 10 02:
   a. Soap dispensers
   b. Paper Towel Dispenser: Roll paper dispenser type
   c. Toilet Paper Dispenser: Jumbo roll dispenser
   d. Waste receptacles, free-standing.
   e. Toilet Seat Cover Dispenser.
7. Owner's custodial vendor shall furnish and install custodial accessories at all janitor closets.
8. Contractor shall furnish and install accessories at all public use shower rooms:
   a. Extra heavy-duty shower curtain rod
   b. Shower curtain
   c. Folding shower seat (at all accessible shower stalls)
   d. Vandal resistant soap dish
   e. Robe hook
9. Sanitary napkin and tampon vendor unit shall not be specified or installed.

1. Locate hose and valve cabinets so the centerline of the hose valve is in accordance with NFPA Pamphlet 14. Locate fire extinguishers and fire extinguisher cabinets in accordance with the Florida Fire Prevention Code.
2. Maintain the full fire rating and acoustical rating of walls wherever hose and valve cabinets and fire extinguisher cabinets are installed
3. Fire hose cabinet units shall be steel with baked enamel finish, flanged, semi- recessed mounted types (similar to fire extinguisher cabinets) large enough to accommodate a fire extinguisher beside the fire hose. Provide each cabinet with a lockable, full glazed, clear acrylic type door.
4. Whenever possible, all valves and fittings for fire department connections shall be rotated approximately 22-1/2 degrees down from vertical to facilitate easy hose connection.
5. Provide semi-recessed type fire extinguisher/valve cabinets with 2 1/2-inch rolled edge trim projection and full clear acrylic glazed door with lock. Basis of Design: Larsen's Lock with clear anodized aluminum finish from the Architectural Series.
6. Provide manufacturer's standard fire extinguisher brackets appropriate for the type of fire extinguisher to be supported.
7. Provide Blade style sign per the Broward College Sign Standards Manual.

11 30 00 | SMALL EQUIPMENT AND APPLIANCES

1. Require Contractor to provide all plumbing, power, exhaust venting, wiring and connections required to install all appliances and equipment, whether Contractor or Owner provided.
2. Coordinate rough-in dimensions and clearances for proper installation and functioning.
3. The following are guidelines. Coordinate with BCPM for project-specific required appliances and equipment and identify on the Contract Documents.
    a. Workrooms: Copiers, Printers.
        i. Provide one (1) dedicated power/data point per photocopier/printer unit.
        ii. Provide one (1) additional power outlet for electric stapler, pencil sharpener, etc.
    b. Breakrooms: Coffee / Beverage station, Microwave, Refrigerator.
        i. Provide one (1) dedicated power outlet for a Microwave. If the breakroom serves more than 10 individuals, add a second Microwave dedicated power outlet.
        ii. Provide one (1) dedicated power outlet for a Refrigerator.
        iii. Provide at least two (2) dedicated power outlets (three (3) preferred as space permits) in the counter backsplash area for User-provided appliances such as multiple coffee machines and toaster ovens.

11 66 50 | GYMNASIUM EQUIPMENT

1. All proposed equipment shall meet standards set forth by the National Collegiate Athletic Association (NCAA) and the USA Volleyball.
2. Review all proposed gymnasium equipment with BCPM for approval.
3. Source Limitations: Obtain each type of gymnasium equipment through one source from a single manufacturer.
4. Coordination:
    a. Coordinate floor inserts with structural floors and finish flooring installation and with court layout and game lines and markers on finish flooring.
    b. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension system components with other construction including light fixtures, HVAC equipment, fire suppression system components, and partition assemblies.

11 66 70 | BASKETBALL EQUIPMENT

1. Backboards:
    a. Folding Type per the manufacturer's standard assembly for backboard, ensure that the specified hardware and fittings permit the backboard folding.
    b. Tempered glass, rectangular shaped, safety padding.
    c. Electric Operator.
2. Basketball Goals: Breakaway spring-loaded, self-resetting, nylon net.
3. Goal Height Adjuster: Electric with integral gear-drive motor to adjust from 8 to 10 feet.

This section includes:

11 66 80 | VOLLEYBALL EQUIPMENT

1. Provide a court system of adjustable posts, net, and tensioning winch meeting requirements for FIVB, USA Volleyball, NCAA and NFHS competition requirements.
2. Include the following accessories:
   a. Floor plates to cover inserts
   b. Judges' Stand.
   c. Safety Pads: Provide pads with a hook-and-loop closure or attachments for the following components: Post Standards, Net Lines, Judges' Stands.
   d. Wall Storage Rack: Provide a standard unit designed for mounting on walls and for storing post standards.
   e. Storage Cart.

11 66 90 | SAFETY PADS

1. Provide Safety Pads at gymnasium walls and columns.
2. Mounting: Removable; Z-clips fixed to wall and to padding, top and bottom.

12 24 00 | WINDOW SHADES

1. Non Powered Roller Shades
   a. Basis of Design Manufacturer: MechoShade Systems, Inc. Mecho/5 System with Standard Bracket and Square Fascia, clear anodized finish.
   b. To be installed at all exterior office and classroom windows.
2. Powered Shades
   a. Basis of Design: MechoShade Systems, Inc. Intelligent Motor Control System / Whisper Shade-IQ Motor System.
   b. Provide at special conditions based on BCPM review and approval.
   c. Provide wall switches.
3. Shade Cloth
   a. See Appendix 12 01 Roller Shades.
   b. Basis of Design: MechoShade Systems, Inc. ThermoVeil group, Series 2100.
   c. Basket Weave: 2 by 2 basket-weave pattern.
   d. Openness Factor: 10%.
   e. Content: 75% PVC and 25% Poly; 16.4 oz/sq.yd.
   f. Warranty: 10-year Limited
4. Provide Basis of Design listed above or approved equal from one of the following manufacturers:
   a. Draper, Inc: www.draperinc.com.
   b. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com.
   c. SWFcontract, a division of Springs Window Fashions, LLC.: www.swfcontract.com.
   d. Other manufacturers may be acceptable based on BCPM review and approval.
5. At designated Egress windows, window shades must not conflict with required signage and egress function.

12 40 00 | FURNITURE

1. Furniture systems and non-attached FF&E items are provided by the College unless determined otherwise.
2. Demountable Partitions: Owner purchased, Contractor Installed. Indicate Layout, Power and Data on Contract Documents for Contractor coordination.

12 48 13 | ENTRANCE MATS AND FRAMES

1. Provide permanent walk-off mats as part of project at every exterior opening.

13

DIVISION 13
SPECIAL CONSTRUCTION

NOT USED

BROWARD COLLEGE®

14 20 00 | ELEVATORS

1. Preferred manufacturers offering elevators that may be incorporated into the Work include, but are not limited to, the following:
   a. KONE
   b. Otis Elevator Co.
   c. Schindler Elevator Corp.
   d. TK Elevator
2. Provide manufacturer's standard enameled-steel car enclosures with removable wall panels, suspended ceiling, trim, accessories, access doors, doors, power door operators, sills (thresholds), lighting, and ventilation.
3. Minimum requirements:
   a. New Construction: Consider two elevators based on BCPM review and approval.
   b. Buildings 3 stories or under: Holeless Hydraulic, machine-room-less.
   c. Buildings 4 stories and over: Electric Traction, machine-room-less.
   d. Rated Load: 3500 lb. min. or as required to suit project. Provide min. 5,000 lb. rated loads at all laboratory/science buildings typical.
   e. Wireway to include cabling that will support IP cameras and access control.
   f. Provide two-way visual communication, continuously monitored, and in compliance with ASME A17.1 requirements.
   g. Controls: Automatic recall.
   h. Car Enclosures: As follows unless otherwise required:
      i. Inside Width: 80 inches.
      ii. Inside Depth: 65 inches.
      iii. Inside Height: 95 inches.
      iv. Front Walls Graffiti and Scratch resistant: Satin stainless steel with integral car door frames or as approved by the College.
      v. Car Fixtures: Satin stainless steel.
      vi. Door Faces (Interior): Satin stainless steel.
      vii. Door Sills: Aluminum.
      viii. See Appendix 14 01 – Elevator Interior Finishes
4. Additional requirements for elevators:
   a. Provide inspection certificate in each car, mounted under acrylic cover with satin Stainless-steel frame.
   b. Provide protective blanket hooks in all four sides of each car and one complete set of full-height blankets.
5. The Design Professional shall coordinate specific building equipment clearances with elevator openings and capacity in the case of Laboratory Buildings or similar. Note that items such as fume hoods and other lab specific equipment may require specific clearances.
6. Require Coordination between Elevator manufacturer / installer and other installers for equipment provisions necessary for proper elevator operation.
7. Require a Preinstallation Meeting.
8. Require a Maintenance Contract:
   a. Provide Initial Maintenance Contract of elevator system and components in accordance with ASME A17.1 for 12 months from Date of Substantial Completion.

b. Submit proposal for five-year continuation of Maintenance Contract in accordance with ASME A17.1 and requirements below for installed elevator equipment.
   i. Perform maintenance contract services using competent and qualified personnel under the supervision and direct employ of the elevator manufacturer or original installer.
   ii. Include systematic examination, adjustment, and lubrication of elevator equipment periodically
   iii. Maintain and repair or replace parts, whenever required, using parts produced by original equipment manufacturer.
   iv. Perform work without removing cars from use during peak traffic periods.
   v. Provide emergency call back service within two hours for 24 hours a day, 7 days a week throughout period of the maintenance contract.

15-20

DIVISIONS 15-20
RESERVED FOR FUTURE EXPANSION

NOT USED

BROWARD COLLEGE®

21 00 00 | FIRE SUPPRESSION GENERAL REQUIREMENTS

1. All new buildings shall be equipped with automatic fire suppression systems in accordance with NFPA 13.
2. Comply with latest editions of the Florida Building Code, Florida Fire Prevention Code, NFPA and all other required Codes and regulations.
3. Fire protection systems shall be designed by a Florida licensed Fire Protection Engineer or a Florida licensed Mechanical Engineer with (5) years of experience in fire protection systems.
    a. The Fire Protection engineer shall provide 1/8th scaled drawings that meet the minimum requirements established in FAC 61G15-32.004 (2) (a-j) for the Performance Based Design.
    b. In addition to the above requirements, provide RCP plans identifying sprinkler head locations (centered on ceiling tile typical). RCP shall include all ceiling mounted devices or potential conflicts, including low voltage WAP devices, lighting, HVAC, A/V, access control and cameras.
    c. Plans shall also include sprinkler main size and routing, sprinkler type, temperature, and k-factor, area of coverage, valves and riser locations, riser elevations, penetration details through walls and slabs, service entrance details from exterior of building, drain locations, and hanger and support details.
4. Final Inspections: All Fire Protection inspections are performed by the BC Fire Marshall. Buildings leased by the college require local AHJ/Fire Marshal inspections in addition to BC Fire Marshall inspections.
5. Submittals/Shop Drawings:
    a. A licensed Fire Sprinkler Contractor shall provide 1/8th scale working plans, prepared according to the Florida State Statutes and NFPA 13, that have been approved by the Engineer of Record and authorities having jurisdiction, including hydraulic calculations. 1/4 scale drawings shall be provided for congested areas such as fire pump and riser rooms. Both shop drawings and hydraulic calculations shall be signed and sealed.
    b. All materials and equipment shall be submitted and reviewed by the Engineer of Record prior to procurement.
6. Sprinkler pipe material requirements and joining methods.
    a. Piping Materials
        i. Schedule 40 Black Steel Pipe (NPS 2-1/2" and Smaller)
            1. Specification: ASTM A53 Type E, Grade B
            2. Material: Black steel
            3. Wall Thickness: Standard weight (Schedule 40)
        ii. Schedule 10 Black Steel Pipe (NPS 3" and Larger)
            1. Specification: ASTM A135 or ASTM A795
            2. Material: Black steel
            3. Wall Thickness: Schedule 10
    b. Joining Methods
        i. Small Pipe Sizes (NPS 2" and Smaller)
            1. Threaded connections only
            2. Factory or field threaded.
        ii. Large Pipe Sizes (NPS 2-1/2" and Larger)
            1. Threaded connections, Welded connections, Roll-grooved with mechanical couplings
            2. Plain end or field prepared to match joining method.
            3. Grooved-End-Pipe Couplings for Steel Piping shall include two ferrous housing sections to ASTM A536,

EPDM-rubber gasket to ASTM D2000, and bolts and nuts to ASTM A449.

Pipe Size	Schedule	Material	Joining Method
NPS 2" and smaller	40	Black Steel	Threaded Only
NPS 2-1/2"	40	Black Steel	Threaded, Welded, or Roll-Grooved
NPS 3" and larger	10	Black Steel	Threaded, Welded, or Roll Grooved

c. All fire protection piping shall be painted red.
d. CPVC fire protection piping systems are not acceptable.

7. Provide frangible glass bulb quick response type sprinkler heads with ordinary temperature rating of 155°F except where subject to high temperatures caused by heaters, kiln equipment, hot pipes, radiant ceilings, or other heat sources in which case they shall be of the high temperature type.
   a. Fire Sprinkler Acceptable Manufacturers:
      i. Viking Corporation.
      ii. Reliable Automatic Sprinkler Co., Inc.
      iii. Tyco Fire & Building Products LP.
      iv. Victaulic Company.
8. Flat plate concealed sprinkler heads are acceptable and preferred.
   a. In areas where ceilings are provided, concealed pendent sprinklers shall be utilized.
   b. In areas without ceilings and/or open to structure, upright sprinklers shall be utilized.
   c. Sprinklers subject to mechanical injury shall be provided with listed guards. Areas include, but are not limited to gymnasiums, storage rooms, and mechanical rooms.
9. Sprinkler heads shall be placed under all obstructions greater than 48" wide, or any size obstruction that would prevent total coverage of the floor area.
10. Flexible sprinkler head connections are acceptable with approval and shall be UL listed and FM approved.
11. Electrical rooms SHALL NOT contain sprinkler heads. In lieu of fire sprinklers, all electrical rooms shall be 2-hour fire rated, shall not be used for storage, shall contain dry-type electrical equipment only, and shall be equipped with heat detectors.
12. Sprinkler piping shall not be routed through or above electrical or communications rooms.
13. Each individual building shall be provided with a dedicated fire sprinkler riser consisting of alarm check valve, water flow switch, and indicating butterfly valve with tamper switch. An electric driven bell shall be provided on the exterior of the building adjacent to the water entrance.
14. Each individual building shall be provided with a dedicated freestanding Fire Department Connection. Fire Department Connections shall be located not more than 100 feet from a fire hydrant and shall be provided with signage indicating the building served.
15. Backflow preventers serving fire sprinkler systems shall be Double Detector Check Valve (Ames Series 3000SS shall be the basis of design) with stainless steel main valve body and OS&Y gate valves equipped with tamper switches. All test and drain valves shall be equipped with stainless steel valve stems and handles. All nuts and bolts on backflow preventer shall be stainless steel. Backflow preventers shall be installed on 6" concrete pads that extend a minimum of 12 inches past the assembly in all directions.

16. Utilize clean agent fire extinguishing systems in special conditions only if required by users.
17. Utilize pre-action fire suppression systems in special conditions only if required by users.
18. Testing of complete fire protection system: Include in the specifications the requirement that the contractor shall pretest under full emergency mode all components inclusive of emergency generator, transfer switch, sequence of operations, fire pump, emergency lighting, strobes, smoke detectors, etc., prior to State Fire Marshal inspection. Specifications shall address and detail appropriate piping and appurtenances required to perform the test and demonstrations as stipulated by NFPA.
    a. Testing shall only be conducted when building is unoccupied. A minimum of 72 hours of notice shall be given to Broward College prior to any testing. Contractor shall assume all costs associated with testing.
19. Standpipe hose valve systems shall be provided in buildings where the floor level of the highest story is located more than 30 feet above the lowest level of fire department vehicle access. Installation shall be in accordance with FBC and NFPA 14.
20. Renovations to buildings without fire suppression systems.: Fire protection engineers shall confirm with architect and code official to determine whether a fire suppression system should be added to the building.

21 22 00 | CLEAN-AGENT FIRE EXTINGUISHING SYSTEMS

1. Documents call for extinguishing-agent containers: Steel tanks, with manifold for multiple storage containers [and with reserve-supply storage containers].
    a. Extinguishing Agent: [FK-5-1-12] [IG-541].
    b. Discharge Nozzles: One-piece brass or aluminum alloy.
    c. Control Panels
    d. Voltage: Coordinate with available electrical circuit
    e. Mounting: Recessed flush with surface/Surface
    f. Separate supervised circuits for each independent hazard area
    g. Automatic switchover to standby batteries
    h. Storage container, low-pressure indicator
    i. Detection Devices
    j. Ionization detectors.
    k. Photoelectric detectors
    l. Remote air-sampling detectors
    m. Manual Stations
2. Surface/Semi recessed mounted with clear plastic hinged guard including the following:
    a. Manual release.
    b. Abort switch.
    c. EPO switch.
3. Switches shall be provided for the following:
    a. Low-agent pressure switches.
    b. Power transfer switches.
    c. Door closers.

4. Alarm Devices shall be included for the following:
    a. Bells

b. Horns
c. Strobe lights.

5. Exterior Installations: All exterior mounted devices or devices exposed to non-conditioned air shall be weatherproof.

21 31 13 | ELECTRIC DRIVE CENTRIFUGAL FIRE PUMPS

1. Fire pumps shall be electric drive, horizontal split case type, UL/FM approved.
2. Fire pumps shall be provided with an Automatic Transfer Switch and emergency power supply from an on-site emergency generator.
3. Motor starting methods shall be closed transition Y delta.
4. Fire pump and jockey pumps that are base mounted shall be placed on a pre-poured chamfered housekeeping pad (refer to Division 03 for details and finish). Secondary pour of pad after pump is installed is not acceptable.
5. Fire pump rooms shall be 2-hour rated and shall not contain any storage. Fire pump rooms shall only contain equipment related to the building fire suppression system and/or domestic water system. Fire pump rooms shall be provided with sound attenuation. Fire pump rooms shall be located so that they have access from the exterior of the building with full size double doors.
6. Fire pump rooms shall be equipped with a floor drain connected to the sanitary sewer system.
7. Provide Nameplate: Identify model number, size, capacity, electrical characteristics, serial number, along with other items scheduled for equipment on drawings. Indicate motor horsepower, voltage, phase, cycles, RPM, full load amps, locked motor amps, frame size, manufacturer's name and model number, Service Factor, Power Factor, efficiency and other pertinent information. Locate motor nameplates for easy reading. Relocate or provide new nameplates on motors if original nameplates are not located for easy reading.
8. Fire pumps shall be provided with vibration pads/vibration isolates.

22 00 00 | PLUMBING GENERAL REQUIREMENTS

1. When a discrepancy between the Broward College Design Standards, the engineering specifications, and the engineering drawings is found, the most stringent requirement shall apply. The discrepancy shall be immediately brought to the attention of Broward College and the engineer and documented through an RFI.
2. No piping carrying domestic water, CHW, fire sprinkler water, etc. shall be run through or over any of the electrical rooms, equipment rooms, or telecommunication rooms.
3. Installation of any plumbing piping inside the block cores of exterior concrete masonry unit (CMU) walls is prohibited. Coordinate with the architect and install piping in furred walls, pipe chases, etc.
4. Wall hydrants to be located along the building exterior at 100 foot intervals and shall be installed in flush hydrant boxes. Wall hydrants and hose bibbs shall have integral vacuum breakers.
5. 3/4" flush mounted anti-siphon wall hydrants with stainless steel covers shall be used for all building interior and exterior installations. 3/4" hose bibbs shall only be used in mechanical rooms.
6. A hose bibb and floor drain shall be installed in each mechanical room.
7. A wall hydrant shall be provided below the lavatory or group of lavatories in each restroom.
8. Each horizontal sanitary and storm drain pipe shall be provided with a clean out at the upstream end of the pipe. Offset cleanouts so they are not located in classrooms or general office spaces. Use floor cleanouts whenever possible. All piping shall run at 1/8" per foot slope, minimum. Wall cleanouts shall be sealed tight to wall as to not allow any fluids or waste down the inside of the wall.
9. Cleanouts shall be provided at 100 foot minimum intervals and at every change in direction greater than 45 degrees.
10. Each building drain shall be provided with a two-way grade cleanout within 5 feet after exiting the building. If the two-way cleanout is installed in a grass area, it shall be embedded in a reinforced 18" x 18" x 8" thick concrete pad.

22 05 13 | COMMON MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT

1. Poly phase motors: Design B, medium induction motors.
   a. Efficiency: Energy efficient.
   b. Service Factor: 1.15.
   c. Multispeed Motors: Variable torque
   d. Rotor: Random-wound, squirrel cage.
   e. Enclosure Material: Cast iron for motor frame sizes [324T] and larger; rolled steel for motor frame sizes smaller than [324T].

22 05 53 | IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

1. Provide identification for all piping, valves, and equipment including labels, tags, and color coding. Where required, identify all existing piping systems by color-coding and arrows indicating the direction of flow. Conform to ANSI A13 1-75 Scheme for Identification of Piping Systems. Piping Systems include:
   a. Domestic Cold Water - Dark Green
   b. Domestic Hot Water - Light Green
   c. Acid Piping – Yellow
   d. Sanitary Waste and Vent
   e. Storm

22

DIVISION 22
PLUMBING

This section includes:

f. Propane Gas - Gloss Rust
g. Gas Utility Piping – Yellow

22 11 16 | DOMESTIC WATER PIPING

1. Loose Domestic water piping shall be Type K copper with brazed fittings and joints for use below grade. Above ground shall be Type L copper with soldered or pressure sealed joints. Pressure sealed joints and fittings shall be Viega ProPress only. CPVC is prohibited.
2. Do not run domestic water piping over or through electrical or IT rooms.

22 11 19 | DOMESTIC WATER PIPING SPECIALTIES

1. Loose key stops shall be provided for all sinks, lavatories, hose bibs, and wall hydrants.
2. Wall hydrant basis of design: Zurn Z1330-C-SS
3. Valves: All valves 2-1/2-inch and smaller shall be full-port bronze ball valves. Valves over 2-1/2 inches shall be butterfly valves. Basis of design manufacturer shall be NIBCO. Do not use gate valves). All valves shall be provided with stainless steel handles and valve stems (stainless steel trim).

22 13 16 | SANITARY WASTE AND VENT PIPING

1. Sanitary sewer piping shall be ASTM D 1785 Schedule 40 Solid Wall PVC for use below grade, and CISPI 301 NO-HUB cast iron for above grade installations. Schedule 40 PVC may be used with College approval on single story buildings. Copper drainage tube (DWV) may be used for waste arms and traps above grade.

22 13 19 | SANITARY WASTE PIPING SPECIALTIES

1. Provide floor drains with automatic trap primers in all, but not limited too, toilet rooms, janitorial closets, and mechanical equipment rooms.
2. All floor drains and floor sinks shall be equipped with trap primers connected to the discharge pipe of the water closet flush valve in order to prevent the evaporation of the trap seals. In areas where that is not possible, the primer connection shall be made to the domestic water line of a lavatory or a sink or p-trap tail-piece.
3. Floor Drains, Roof Drains, and Cleanouts basis of design:
   a. Zurn
   b. Watts
   c. Josam
   d. J.R. Smith

22 13 23 | SANITARY WASTE INTERCEPTORS

1. Grease Interceptors:
   a. Gravity Precast Concrete
   b. Polyethylene hydromechanical
2. Oil Interceptors:
   a. Factory-fabricated cast iron or steel.
   b. Polyethylene

3. Sand Interceptors: Factory-fabricated cast iron or steel.
4. Precast-concrete manhole risers.

22 13 29 | SANITARY SEWERAGE PUMPS

1. Submersible, quick-disconnect, double-seal effluent pumps:
   a. Number of Pumps: One
   b. Pump Casing: Cast iron, with open inlet.
   c. Impeller: abrasion-resistant cast iron, closed or semi-open design.
   d. Pump and Motor Shaft: Stainless steel
2. Submersible, quick-disconnect, progressing-cavity, grinder sewage pumps:
   a. Number of Pumps: Dual
   b. Pump Body: Cast iron
   c. Pump Bearings: Radial and thrust types.
   d. Pump Shaft: Steel.
   e. Rotor: Stainless steel.
   f. Seal: Packing gland and mechanical types.
   g. Motor: Hermetically sealed, capacitor-start type.

22 14 13 | FACILITY STORM DRAINAGE PIPING

1. Storm sewer piping shall be ASTM D 1785 Schedule 40 Solid Wall PVC for use below grade, and CISPI 301 NO-HUB cast iron for above grade installations. Schedule 40 PVC may be used with College approval on single story buildings.

22 14 14 | EQUIPMENT DRAIN AND CONDENSATE

1. Provide copper DWV above grade and Schedule 40 PVC below grade.

22 15 19 | PACKAGED AIR COMPRESSORS AND RECEIVERS FOR HVAC

1. Provide reciprocating air compressors to operate pneumatic valve actuators for operation of chilled water systems:
   a. Compressor(s): Use 2 stage for above 5 HP.
   b. Mounting: Freestanding
   c. Receiver: Steel tank.
   d. Pressure lubricated
   e. Automatic drains for air dryers and receivers

22 15 20 | PACKAGED AIR COMPRESSORS AND RECEIVERS FOR CLASSROOM LABS

1. Reciprocating air compressors:
   a. Compressor(s): Use 2 stage for above 5 HP.
   b. Mounting: Freestanding
   c. Receiver: Steel tank.
   d. Oil free for labs or specialty use
   e. Automatic drains for air dryers and receivers

22 15 21 | PACKAGED AIR COMPRESSORS AND RECEIVERS FOR TOOLS AND EQUIPMENT ROOMS

1. Reciprocating air compressors:
   a. Compressor(s): Use 2 stage for above 5 HP.
   b. Mounting: Freestanding
   c. Receiver: Steel tank.
   d. Pressure lubricated
   e. Automatic drains for air dryers and receivers

22 30 00 | PLUMBING EQUIPMENT

1. Water heaters: Use point of use units whenever possible. Generally use electric units up to 85 gallons and gas heaters for larger tanks if gas service is available. All water heaters shall be ASHRAE 90 rated and glass lined. Show on the plumbing fixture schedule.

22 40 00 | PLUMBING FIXTURES

1. Plumbing fixtures: Provide complete list and catalog cut sheets to the College prior to the completion of Construction Documents. Fixture tags shall be shown on the Drawings (including risers and detail sheets). Acceptable manufacturers include the following:
   a. Sloan (basis of design)
   b. American Standard
   c. Kohler
   d. Zurn
2. Water Closets
   a. Style: Vitreous-china, floor mounted, one piece bowl with sensor operated battery powered flush valve.
      i. Bowl Type: Elongated siphon-jet design. Include bolt caps matching fixture.
      ii. Height: Standard (15") and Accessible (17")
      iii. Design Consumption: 1.28 or dual flush 1.1/1.6 gal./flush
      iv. Color: White
      v. Supply Size: NPS 1
   b. Basis of Design:
      i. Toilet: Sloan #ST-2009-STG
      ii. Flush Valve: Sloan ECOS #111-1.6/1.1-LT
      iii. Seat: Centoco #500CC
3. Urinals
   a. Style: Vitreous-china, wall mounted, back outlet, one piece urinal with sensor operated battery powered flush valve.
      i. Type: Siphon-jet
      ii. Strainer or Trapway: Integral cast strainer with integral trap
      iii. Height: Standard and Accessible
      iv. Design Consumption: 0.125 gal./flush
      v. Color: White

vi. Supply Size: NPS 3/4
vii. Fixture Support: Urinal chair carrier

b. Basis of Design:
i. Urinal: Sloan #SU-1009-STG
ii. Flush Valve: Sloan ECOS #8186-HW-0.125

4. Lavatories
a. Style: Vitreous-china, counter mounted, one piece ADA lavatory with sensor operated battery powered faucet.
i. Style: Center hole cut only.
ii. Height: Accessible
iii. Design Consumption: 0.5 GPM
iv. Color: White
v. Supply Size: NPS 1/2
vi. Fixture Support: Counter Mounted

b. Basis of Design:
i. Lavatory Bowl: American Standard Mezzo Semi-Countertop Sink #9960.001
ii. Faucet: Sloan EBF-415-BAT-0.5GPM-CP
iii. Drain: McGuire #155WC
iv. P-Trap: McGuire #8872
v. Supply Stops: McGuire #H2165LK
vi. Insulation Kit: Truebro 103

5. Service Sinks
a. Style: Flush-to-wall, floor mounted, precast terrazzo fixture with rim guard.
i. Shape: Sqaure
ii. Size: 24 by 24 inches
iii. Height: 12 inches
iv. Tiling Flange: On three sides.
v. Rim Guard: On all top surfaces
vi. Drain: Grid with NPS 3 outlet

b. Basis of Design:
i. Bowl: Fiat #MSB 2424
ii. Hose & Hose Rack: Fiat #832-AA
iii. Mop Hangar: Fiat 889-CC
iv. Wall Guard: Fiat MSG2424
v. Bumperguards: Fiat E-77-AA
vi. Faucet: T&S #B-0665-BSTR

6. Driking Water Fountains
a. Include one water / bottle filler combination drinking fountain per floor.
b. Acceptable Manufacturers:
i. Oasis
ii. Elkay

7. Lavatories shall be provided with cold water only. Lavatories shall be limited to 0.5 GPM and provided with laminar flow aerators.
8. All ADA lavatories shall be provided with insulated P-traps installed parallel to the wall.
9. All new lavatories, water closets, and urinals shall be sensor operated and battery powered.
10. Water closets in all new projects shall be high efficiency 1.28 GPF or dual flush 1.1/1.6 GPF fixtures. Urinals in all new projects shall be 0.125 GPF.
11. Water closets installed in back-to-back such as in group toilets shall be provided with double 45 degree wye or double combination wye 1/8th bend fittings. The use of double sanitary tees is prohibited.

22 62 19 | VACUUM EQUIPMENT FOR LABORATORY FACILITIES

1. Documents call for packaged, oil-free, rotary, sliding-vane vacuum pumps:
   a. Vacuum Pump(s): One
   b. Mounting: Freestanding
   c. Receiver: Vertical, steel tank.
   d. Automatic control switches to alternate lead-lag vacuum pumps for duplex vacuum pumps.

23 00 01 | GENERAL HVAC REQUIREMENTS

1. Mandatory Prefabrication / Installation Meeting: The general contractor shall include all associated trades in a mandatory pre-fabrication and pre-installation meeting on site. The sheet metal contractor shall be responsible for providing coordinated shop drawings for final coordination with all other trades.
2. Standards: All equipment and devices shall bear U.L. label, the label of an industry recognized approved testing agency or A.G.A. certification for said item of equipment or device. All electrical devices must be U.L. approved.
3. Drawings: Architectural and structural drawings take precedence over mechanical drawings with reference to the building construction. Mechanical drawings are diagrammatic and indicate the general arrangement and extent of work. Architectural drawings indicate more exactly the desired relationship between diffusers, registers, lighting fixtures, equipment, electric panels and devices, plumbing fixtures, and other items which remain exposed in the completed building. Exact locations and arrangement of materials and equipment shall be determined, with the acceptance of the Architect/Engineer, as work progresses to conform in the best possible manner with the surroundings and with the adjoining work of other trades. Where locations of equipment, devices or fixtures are controlled by architectural features, establish such locations by referring to dimensions on Architectural drawings and not by scaling drawings.
4. All electrical and data rooms shall be air conditioned by the primary building air conditioning system during chiller plant normal hours of operation. Data rooms shall be air conditioned by a secondary standard split system during off hours. Provide BMS controls for all applications.
5. Specify a minimum of 25 CFM differential for positive and negative rooms. Provide positive 0.06 inches-WG referenced to outdoor pressure.
6. Commissioning should be performed by third party.
7. Roof mounted air handlers are not allowed.
8. Specified HVAC systems will be selected with the following design conditions:
    a. Summer
        i. Outside Air Temperature: 95°F dry bulb and 78°F wet bulb
        ii. Inside Conditions: 75°F and maximum 60% relative humidity
    b. Winter
        i. Outside Air Temperature: 46°F
        ii. Inside Conditions: 68°F and maximum 60% relative humidity
    c. Systems
        i. Chillers shall be selected for 41°F leaving water temperature (LWT) and 56°F entering water temperature (EWT).
        ii. AHU coils shall be selected for 41°F EWT and 56°F LWT.
9. Documents shall incorporate life-cycle considerations and a holistic approach with respect to energy conservation to avoid over-designing of systems.
    a. Energy Conservation: Refer to State Requirements for Educational Facilities (SREF) concerning heat recovery and thermal storage. The College wishes to maximize all feasible energy conservation measures. Consult with local electric utility and provide current program information to the BCPM for consideration for each project.
    b. Provide energy calculations including cooling, heating, and ventilating loads.

10. Documents shall call for plans, elevations, sections, and detail drawings to fully show the extent, nature and requirements of mechanical work. Plan notations shall identify the following:
    a. Rooms and their usage
    b. Locations for ducts, VAV's and accessories
    c. Piping and accessories
    d. Equipment and accessories
11. Descriptive notations must be used with symbols.
    a. Floor Plans and Site Plans: Show all ducts, piping, and equipment properly located and drawn to scale.
    b. Renovation Work: Determine where structural limitations will permit component installation and indicate those locations on the Drawings with accurate dimensions.
    c. Coordination: All trades must coordinate installation to avoid conflicts and/or code violations.
    d. Maintenance Access: Show coil pull, filter pull and motor access areas for all air handling units.
    e. Service Piping: Show all chilled water piping with insulation to scale. Include plans and elevations to ensure access and serviceability.
12. Architect/Engineer shall confirm that clear space requirements for the installation of mechanical equipment have been met. Contract documents shall leave no question that clear space requirements can be met. Shop drawing equipment layout plan submittal required for mechanical room.
13. Electrical Provisions for HVAC design: Scope of Divisions 22 and 23 shall include the electrical requirements which are indicated to be integral with mechanical work and which can be summarized to include, but are not limited to, the following:
    a. Motors.
    b. Motor starters & VFD's
    c. Wiring from mechanical equipment to electrical work termination (junction box or disconnect switch).
    d. Control switch, pilot lights, interlocks and similar devices.
    e. Electrical heating coils and similar elements in mechanical equipment.
    f. Electrical work specified in Division-23 for the HVAC control system.
    g. Drip pans to protect electrical work.
14. Motors, Starters, Switches: Provide with all motorized mechanical equipment unless otherwise indicated.
15. Piping: Coordinate all pipe routes with adjacent equipment. Do not run piping directly above electrical (or electronic) equipment. Layout drawings for mechanical rooms shall show all equipment and mounting locations.
16. Access to mechanical rooms in new construction shall be located for access without disturbing occupied spaces.
17. HVAC subcontractor shall layout, and mark, all wall penetrations with dimensions and elevations during framing layout for coordination of all trades. These shall also be shown on shop drawings.
18. Provide UL listed penetration details including sleeves as needed to allow passage of items installed under any section of Division 23.
19. Interruption of existing services: Any interruption of existing services shall be coordinated 2 weeks in advance with the Broward College Project Manager (BCPM). Shutdown time and duration of critical services shall be approved by the Owner.

20. Cleaning and protection
    a. Ductwork and Components: Keep the interior of the duct system free from dirt and rubbish and other foreign matter by use of temporary protection film on each duct component. All fan motors, switches, and other items, shall also be protected from dirt, rubbish and other foreign matter during building construction. Thoroughly clean all components of the ductwork and remove all dirt, scale, oil and other foreign substances which may have accumulated during the installation process. Remove all pen/ permanent marker markings from duct & equipment.
    b. Equipment: All mechanical equipment provided shall be thoroughly cleaned of all dirt, oil, concrete, etc. Any dents, scratches or other visible blemishes shall be corrected and the appearance of the equipment made "like new" and to the satisfaction of the BCPM. Keep the interior of the equipment free from dirt, rubbish, and other foreign matter.
    c. Upon completion, and before final acceptance of the work, all debris, rubbish, leftover materials, tools and equipment shall be removed from the site.
    d. Temporary/Permanent Filters: Install temporary filters on supply and return grills during construction (MERV 7). Provide temporary filters in mechanical equipment (AHU's, FCU's, Split Units, etc.). Install permanent filters at TCO date. Provide one complete replacement set of filters and belts as attic stock.
    e. CPU's required to monitor and operate equipment shall be rack mounted in data rooms. Do not locate this equipment in mechanical/electrical rooms.
21. Shop drawings
    a. Submit shop drawings for duct layouts, enlarged mechanical room layouts with sections and elevations, piping, duct and piping penetration locations and dimensions, dampers, fire alarm devices, RCP overlay, known obstructions, condensate drain routes, valves, temperature sensors, NEC clearances for electrical connections. The design team shall coordinate shop drawings between trades prior to submission to Owner.
    b. Shop drawings shall clearly show Technical and descriptive data in detail equal to or greater than the data given in the item specification. Indicate all characteristics, special modifications and features. Where performance and characteristic data is shown on the drawings or specified, submitted data shall be provided in a degree which is both quantitatively and qualitatively equal to that specified and shown so that comparison can be made. Present data in detail equal to or greater than that given in item specification and include all weights, deflections, speeds, velocities, pressure drops, operating temperatures, operating curves, temperature ranges, sound ratings, dimensions, sizes, manufacturers' names, model numbers, types of material used, operating pressures, full load amperages, starting amperages, fouling factors, capacities, set points, chemical compositions, certifications and endorsements, operating voltages, thicknesses, gauges and all other related information as applicable to particular item.
    c. Shop drawings technical information brochure:
    d. Submit to BCPM, within fifteen days after Notice to Proceed, a hard- cover, 3-ring binder, 8-1/2" x 11" submittal package. Provide correct designation on outside cover and on spine of binder, i.e., "Mechanical." A n electronic (AutoCAD/PDF format) copy shall also be submitted. All shop drawings shall be submitted at one time; partial submittals will not be accepted.
    e. The first page shall list all the Project related information (Broward College Project Number, Campus, Building Number, Architect/Engineer, Contractor, and all major subcontractors and suppliers name and contact information) for this Project. The second page in the submittal package shall be a photocopy of the Division 23 Index from the project specific specifications.
    f. Provide reinforced separation sheets tabbed with the appropriate specifications section reference number and

typed index for each section.

g. Shop drawing technical and descriptive data shall be inserted in the brochure in proper order on all items. Mark the appropriate specification section or drawing reference number in the right-hand corner of each item. Provide complete information, including, but not limited to, wiring and control diagrams, scale drawings showing that proposed substitute equipment will fit into allotted space (indicate all service access, connections, etc.), test data, and other data required to determine if equipment complies fully with the specifications. All typewritten pages shall be on contractor or equipment manufacturer printed letterhead.

h. Shop drawings for piping systems and duct systems (mandatory). The HVAC systems in this project are of a higher-than-normal complexity and will require the mechanical/sheet metal contractor to produce shop drawings for piping systems and duct systems. All shop drawings shall be done in (minimum) AutoCAD/PDF format and shall be of sufficient scale to verify clearances and equipment locations. AutoCAD base files of the building will be provided to the contractor. Shop drawings shall show actual approved mechanical equipment dimensions and all maintenance and operational clearances required. Shop drawings shall also include sections through congested areas such as the corridors of the first and second floors including lighting, multiple levels of ductwork, etc. All trades should be coordinated. Title drawings shall include identification of project and names of Architect, Engineer, Contractor, subcontractor and/or supplier, date, be numbered sequentially and shall indicate the following:
    i. Architectural and structural (as required) backgrounds with room names and numbers, etc., including but not limited to plans, sections, elevations, details, etc.
        1. Fabrication and Erection dimensions.
        2. Arrangements and sectional views.
        3. Necessary details, including complete information for making connections with other work.
        4. Kinds of materials and finishes.
        5. Descriptive names of equipment.
        6. Modifications and options to standard equipment required by the contract.
        7. Leave blank area, size approximately 4 by 2-1/2 inches, near title block (for Engineer's shop drawing stamp imprint).
    ii. In order to facilitate review of drawings, insofar as practicable, they shall be noted, indicating by cross reference the contract drawings, note, and/or specification paragraph numbers where item(s) occur in the contract documents.
    iii. Also provide shop drawings, using architectural reflected ceiling plans, which indicate locations of the following (to be verified by Contractor): Air distribution devices, sprinkler heads, lights and access panels.

i. Air handling unit and ductwork configuration shop drawings
    i. Contractor shall submit a shop drawing for each air handling unit. Such shop drawings shall meet the following requirements:
        1. Be drawn at not less than a scale of 1/4" = 1'-0". Contractor may elect to use a larger scale if he desires (i.e., if drawing of unit is at 1/4" = 1'-0", 1/2" = 1'-0" may be used.).
        2. Clearly show all proposed ductwork configuration changes (sizes, routing, and similar differences) that are different in any respect from the Drawings. Extent of shop drawings shall show all ductwork to and from each unit beginning with and terminating at those points where ductwork is intended to remain unchanged as shown on Drawings. Coordinate with other trades for potential conflicts.

3. Where proposed changes affect any other work such as structure, housekeeping pads, piping, equipment, electrical work or any other work, shop drawings shall clearly show those proposed changes.
4. Where Drawings show units in plan only, shop drawings shall show proposed units in plan and also in elevation in ½" scale. Elevation shall include all related components and controllers associated with the units.
5. Shop drawings shall also show exact locations of related work (such as bar joists, columns, beams, sound attenuators, and like items) which affect the proposed ductwork routing and unit location and configuration.
6. Each section of each air handling unit shall be clearly identified in plan and elevation views. Indicate access door orientation, filter pull, coil and miscellaneous clearances (i.e. b l o w e r m o t o r, coil section, fan section, filter section, mixing box section, etc.).
7. Include copy of all operating manuals.
8. Failure to submit these shop drawings together at the same time with the air handling unit shop drawings will result in total disapproval of the proposed air handling units. Time delays or other reasons will not be considered.

22. Maintenance information: Submit for acceptance Maintenance Information consisting of manufacturer's printed instruction and parts lists for each major item of equipment. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe maintenance.
23. Manufacturer's acceptance: Acceptance by Manufacturer's Representative (for major items of equipment): At completion of construction and after performance verification information as above-mentioned has been gathered, submitted and accepted, provide one copy of this information to the manufacturer's representative. Work required under this section shall include having the representative examine the performance verification information, check the equipment in the field while it is operating, and sign a start-up certification and. at final completion, an acceptance certification for c e r t i f i c a t i o n for record. Submit a copy of the c e r t i f i c a t i o n on each major item of equipment for each brochure. Certification shall be inserted on each brochure with the performance verification information and submittal data. Certifications shall be submitted before equipment is placed into operation and prior to request for final acceptance.
24. System warranty: The work required under Division 23 shall include a one year warranty. This warranty shall be by the Contractor to the Owner to replace for the Owner any defective workmanship, equipment, or material which has been furnished under this Contract at no cost to the Owner for a period of one year from the date of acceptance of the System. This warranty shall also include adjustments of the system required for proper operation during the warrantee period. Explain the provisions of warrantee to Owner at the "Instruction in Operation Conference".
25. Owner's demonstration and training: The Contractor shall give notice in writing to the BCPM that they are ready to give the Owner an "Instruction in Operation Conference". After this notification is received, the BCPM will notify the Contractor the time and date the conference can be held with the Owner. At the end of the conference, a copy of the memo certifying Instruction in Operation and Completed Demonstration shall be signed by the Contractor, Subcontractor, and Owner, and a copy inserted in each brochure.
26. Acceptable manufacturers: Materials and Equipment specified in these contract documents are accepted only in regards to general performance and quality. It shall be the Contractor's responsibility to insure that acceptable materials and equipment meet or exceed the efficiencies, capacities, electrical characteristics, performance and quality of the equipment herein specified. Acceptable equipment must also generally conform, without extensive modification of related systems to the accessories, weights, space and maintenance requirements, etc., of the specified equipment. Any modification to related systems of this or other trades shall be made at the Contractor's expense and the

Contractor shall be responsible for coordination between trades. Any difference in capacity, efficiency, electrical characteristics, weights or quality of product, etc., between specified materials and equipment and acceptable alternates shall be submitted to the BCPM and Architect/Engineer for acceptance within 15 days of Notice to Proceed.

27. Operating and Maintenance Manuals:
    a. Provide three Instructions and Maintenance Manuals.
    b. Hardback three-ring loose-leaf binders.
    c. Title sheet with job name, Contractor's, subcontractor's control subcontractor and related contractor's or material supplier's names, addresses and phone numbers.
    d. Index of contents.
    e. A signed copy of acknowledgment of instructions to the Owner or his authorized representative. Two additional copies of the signed acknowledgment shall be sent directly to the Architect as soon as possible after receipt.
    f. Typewritten operating instructions for the Owner's personnel describing the following for each piece of equipment and systems:
        i. How to start and stop each piece of equipment.
        ii. How to set equipment and systems for normal operation.
        iii. Normal restarting procedures before contacting the service contractor.
        iv. Complete description of functions and operations of each piece of equipment including description of how equipment operates in conjunction with automatic control systems.
        v. Instructions for cleaning, oiling, greasing, fueling and similar tasks.
        vi. Approved shop drawings and submittal data and parts and maintenance booklet for each item of material and equipment furnished under this Division, including (but not limited to) the following: Spare parts list and source of supply for each equipment item; List of valves with location, service, size, model and operating position; Diagrams clearly indicating automatic control hook-up; any as-built wiring diagrams as called for in other sections of this division as needed to show how equipment controls interface with related systems.
        vii. Copies of certificates of inspection.
        viii. Guarantees/Warranties.
28. Verbal and Video Maintenance Operating Instructions:
    a. Contractor to provide verbal, hands-on, operating and maintenance instruction to Owner's authorized personnel for each equipment item and system. Instruction shall be given by competent personnel and videotaped. Video to be submitted with O&M manuals submittal.
    b. Duration: Total instruction period for all systems of this Divisions 22 and 23 shall be issued not less than fifteen (15) working days from the Certificate of Occupancy.
29. Verbal instruction at the site for the following equipment items and systems shall be given jointly by the contractor and the authorized manufacturer's service representative:
    a. Air Handling Units (4 hours)
    b. Chillers, Cooling Towers (5 hours each)
    c. Exhaust Fans (2 hours)
    d. Pumps (2 hours)
    e. Fan Coil Units) 2 hours)
    f. Terminal Units. (2 hours)

g. Energy Recovery Ventilators. (2 hours)
h. DDC Controls (24 hours)
i. Variable Frequency Drives (VFDs) (16 hours)

23 05 13 | COMMON MOTOR REQUIREMENTS FOR HVAC

1. Acceptable Motor Manufacturers:
   a. General Electric.
   b. Westinghouse.
   c. Baldor Electric Co.
   d. Emerson.
   e. Lincoln.
   f. Reliance Electric
   g. Gould Electric
2. Motors shall be totally enclosed fan cooled (TEFC) for all applications, unless application requires otherwise; . i.e., explosion proof where flammable vapors may be present, or any other special type as required by the equipment motor manufacturer's recommendations. All motors shall be rated as HE high efficiency type.
3. Motors designated to operate with a variable frequency drive shall be approved by the manufacturer of the variable frequency drive equipment and the manufacturer of the motor to insure quiet and stable continuous operation over the entire speed range and shall be provided with shaft grounding devices to protect motor bearings.
4. Select motor horsepower to exceed load brake horsepower by 20% to allow for balancing and unforeseen construction conditions.

23 05 16 | EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING

1. Where required, expansion fittings and loops for HVAC piping shall be twin reinforced rubber spheres or flexible-hose type.

23 05 20 | HVAC PIPING

1. Chilled and heating system piping shall be schedule 40 black steel with welded or malleable iron fittings or polypropylene-random (PPR) piping with heat-fusion joints for sizes 2" and larger. Copper, type L, hard drawn pipe shall be used for 1½" and smaller; fittings shall be wrought copper, solder joint, pressure type. Mechanical fittings may be used for iron pipe in accessible above ground locations; mechanical fittings shall be of a single U.S.-based manufacturer. Press-fit fittings may be used for copper piping in accessible above ground locations. Push-on fitting shall not be used. Provide dielectric fittings between dissimilar metals.
2. Chiller condenser water piping shall be schedule 80 PVC with schedule 80, solvent cement welded fittings.
3. Condensate piping shall be Type M or Type L hard drawn copper with wrought copper, solder joint fittings.
4. Where required, fuel oil piping shall be schedule 40 black iron with malleable iron fittings.
5. Where exterior valve boxes are required, please refer to Section 08 31 23 - Floor Access Doors - Exterior.

23 05 23 | GENERAL-DUTY VALVES FOR HVAC PIPING

1. Valves 2 inches and smaller shall be full port ball valves. Valve larger than 2" shall be gate valves. Basis-of-design manufacturer shall be Nibco.

23 05 29 | HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1. All horizontal piping and ductwork shall be supported from the structure.
2. Preferred manufacturer for hangers and support fittings is Grinnell Mechanical Products. Acceptable alternates are:
   a. F&S Manufacturing Corp.
   b. Fee and Mason Manufacturing Co.
3. Hangers In Contact with Copper Piping shall be copper plated or Teflon coated; tape or other isolating material is not acceptable.
   a. Hangers other than in Contact with Copper Piping shall have manufacturer's standard finish.
4. Provide insulation shields for all insulated pipe.
5. POWDER (GUNPOWDER) ACTUATED FASTENERS are not allowed.

23 05 48 | VIBRATION ISOLATION EQUIPMENT

1. Provide vibration isolation supports for all equipment and ductwork, as required, to prevent transmission of vibration and noise to building structure, including air handling units, fans, ductwork, pumps, and similar items.
2. Acceptable manufacturers:
   a. Consolidated Kinetics
   b. Mason Industries
   c. Amber- Booth; Keflex
   d. Flexonics
   e. Vibration Eliminator Company
3. Select all vibration isolation equipment based on recommendations by the manufacturer for each particular application.
4. Unless otherwise noted, spring type vibration isolators shall be used for all motor driven equipment. Provide isolation pads or mounts for equipment having internal vibration isolation for motor driven components, such as air-handling units or chillers.
5. Protect all isolators exposed to weather from corrosion by suitable coatings or finishes
6. Flexible Pipe Connectors shall have the same internal diameter as the pipe in which the connector is installed (not necessarily internal diameters of inlets or outlets of equipment) and be able to absorb the combination of vibratory and/or expansion or contraction motions (lateral and/or axial and/or angular) encountered at each installation.
7. Provide acoustic seals at all wall, ceiling and floor openings through which pipe runs from equipment rooms into adjoining spaces.

23 05 53 | IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

1. Provide complete identification of the mechanical systems including piping, valves and Equipment (i.e.: pumps, AHUs, VAV boxes).
2. This section directly relates to piping and the interconnected equipment and component items for the following systems:
   a. Refrigerant Piping.
   b. A/C Condensate.
   c. Heating Hot Water.
   d. Chilled Water
   e. Interconnecting piping, components, and equipment
3. Provide schedules of all items bearing identification; valve schedules shall be posted in all mechanical and custodial rooms in each building.

23 07 13 | INSULATION, HVAC

Provide insulation on all HVAC system component surfaces operating at temperatures that may create condensation, be hazardous, or where heat gain or loss inhibits proper system operation. These include, but are not limited to, heating water and chilled water supply and return piping, pumps, supply air and outside air ductwork, exhaust air ductwork less than 10 feet from the exterior discharge point. Return air ductwork within the building insulated envelope, equipment that is factory pre-insulated may need no additional insulation unless additional non-factory-installed insulation is required for service and conditions.

1. The total insulation system including insulation, sealant, finishes, etc. shall comply with or exceed all code requirements. All materials and adhesives used shall conform to the requirements of NFPA 90A as to flame spread and smoke developed ratings.
2. Provide the following insulating materials:
   a. Heating, Chilled water, and Condensate piping:
      i. Pre-formed rigid fiberglass with factory-applied kraft reinforced foil vapor barrier jacket not less than 1½ inches thick for piping above ambient temperature.
      ii. Preformed cellular glass with field applied jacket not less than 2 inches thick for chilled water piping.
      iii. Provide elastomeric insulation not less than ½" thick for condensate piping.
   b. Refrigerant piping
      i. Pre-formed rigid fiberglass with factory-applied kraft reinforced foil vapor barrier jacket not less than 1 inch thick.
   c. Pipe insulation jackets: In exterior locations, provide full aluminum jacketing in addition to the insulation and jacket listed above.
   d. Duct insulation:
      i. Fiberglass flexible blanket wrap factory laminated to a reinforced foil kraft (FRK) vapor barrier not less than 1-½ inches thick
      ii. Fiberglass semi-rigid board with a foil scrim-kraft (FSK) reinforced laminate of aluminum foil and kraft bonded to provide a metallic surface finish vapor barrier not less than 1½ inches thick
3. Provide hanger or pipe support shields of 16 gage (minimum) galvanized steel over or embedded in the insulation to prevent deformation of insulation. fastened with pipe straps at each end.

4. Insulate Valves, Cocks and Specialties as for the related piping system in which they are located.
   a. Ambient conditions for the purpose of insulation thicknesses shall be:
      i. nterior: 80oF and 80% RH.
      ii. Exterior: 90oF and 80% RH.
5. Duct systems
   a. Locations and extent of both internal and external insulation for duct systems are described in section entitled "Ductwork" and/or by the "Duct Type and Location Schedule" on the Drawings.
   b. Internal Insulation: Ductwork which is required to be insulated internally (acoustically/thermally lined) shall be insulated as work of the section entitled "Ductwork".
   c. External Insulation: Ductwork which is required to be insulated externally shall be insulated as work of this section.
   d. Factory Insulation: Ductwork which is factory manufactured with internal or external insulation is not to be additionally insulated as work of this section unless specifically stated. Such factory insulated ductwork generally consists of flexible externally insulated ductwork and double walled acoustically thermally lined ductwork.
   e. Interior, Concealed (e.g., ceiling plenums): Where external insulation is required, insulate externally with 2.2 inch thick fiberglass blanket wrap (Type DI-1). Adhere duct insulation using adhesive (Type A-F1) applied in accordance with the manufacturer's recommendations. Where duct width exceeds twenty-four inches (24"), the insulation shall be additionally secured to the bottom of the duct using mechanical fasteners spaced one foot (1') on center. Insulation shall be applied with edges tightly butted, and all joints and breaks in the vapor barrier sealed using glass fabric and mastic applied in conformance with manufacturer's recommendations.
   f. Interior, Exposed, (e.g., air handling unit rooms, areas without ceilings, etc.): Where external insulation is required, insulate with 1-1/2"-inch thick semi-rigid fiberglass board (Type DI-2). Adhere to ductwork with adhesive (Type A-F1). Finish joints and seams with finish fabric (Type FF-GP1).
   g. Provide double-wall insulated galvanized steel duct for all supply and return air ducts within 20 feet of mechanical equipment discharge and return connections. This applies regardless of duct pressure rating.
6. Duct systems equipment
   a. General: Insulate as follows unless detailed to a greater extent on the Drawings.
   b. Fire Damper External Surfaces:
      i. Externally Insulated Duct Locations: Extend duct insulation up face of fire damper to damper sleeve. Seal insulation edges with 4-inch minimum width duct tape.
      ii. Internally Insulated Duct Locations: Provide additional external insulation from a point on the duct 12 inches from the fire damper to the fire damper and on the face of the fire damper to the fire damper sleeve. Seal insulation edges with 4-inch minimum width duct tape.
      iii. Air Distribution Devices: Insulate the backs of all ceiling diffusers and other air outlet devices installed in other than return air plenums as specified for interior concealed ducts.
7. Cold equipment and related components
   a. Condensate Drain Piping From Cooling Equipment:
8. Interior, and Exterior, Protected: Insulate with fiberglass pipe insulation. Thickness 3/4- inch. Provide 25/50 flame/smoke rating.

23 08 00 | COMMISSIONING

1. Designer: Provide to the Owner, TAB contractor, and BAS contractor:
   a. The Owner's Project Requirements.
   b. MEP Design Intent Document.
   c. Basis of Design Report.
2. Contractor:
   a. Completely install and thoroughly inspect, start up, and test, adjust, and balance all systems. Document all systems and equipment.
   b. Assist commissioning agent in performing verification and performance testing.
   c. Provide a BAS technician to work with the commissioning agent at his/her direction.
3. BAS Commissioning agent shall provide the following:
   a. All required instrumentation.
   b. Inspect all devices.
   c. Verify proper electrical voltages and check circuits.
   d. Coordinate with controls subcontractor to obtain all settings.
   e. Test, calibrate, and set all digital and analog devices.
   f. Submit start-up report.
   g. Check for leaks, proper operation of all valves.
   h. Complete demonstration of all systems.
   i. Verify trend log.
   j. Review and provide all operator training.
   k. Review O&M Manuals.

23 09 00 | INSTRUMENTATION AND CONTROL FOR HVAC

1. Electrical/mechanical work: All controllers s h a l l b e manufactured or shipped as integral with Division 23 equipment:
   a. All electric motors and other electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.).
   b. All control circuits and devices. Division 26 shall provide wiring, conduit, and junction boxes from electrical panels to point of use, including the necessary circuit breakers.
   c. All other control circuits, including conduit and boxes.
   d. All control connections to equipment.
   e. All control connections to controllers, switches, motors and other mechanical systems electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.).
   f. Auxiliary control devices.
   g. All control devices (thermostats, pressure switches, flow switches, humidistats, etc.) and make control circuit connections thereto.
   h. Any and all electronic and electric control devices and electric connections thereto.
2. Furnish: All controllers which are generally manufactured and/or shipped as separate but companion items to Division 23 equipment (such as centrifugal chiller starters which are matched with the chillers but are not physically an integral part of the chiller assembly.)

3. Auxiliaries and accessories: Include all auxiliaries and accessories for complete and properly operating systems.
4. All temperature gauges shall be mounted in wells.
5. Provide electronic controllers with pneumatic actuators for chilled water control valves

23 09 23 | DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC

1. Furnish all labor, materials, equipment, and service necessary for modifications, and additions, to the existing DDC temperature control system in the building or for new systems in Broward College buildings, as defined by ANSI/ASHRAE Standard 135B2001, Direct Digital Controls, electronic interfaces and actuation devices, as shown on the drawings and as described herein.
2. The existing Broward College DDC infrastructure is Andover. All controls for renovation and new projects shall be provided by Andover, Inc. and shall be in accordance with the Broward College DDC standards and requirements.
3. The control system shall use an open architecture that matches the existing campus control system. No substitutions shall be accepted.
4. Use Native BACnet. as the common communication protocol between all controllers and integral ANSI / ASHRAE™ Standard 135B2001.
5. The System shall provide local and remote Web-Based Graphical User interface where the owner may make all adjustments, settings, and changes through the same software during any single session without having to launch an additional piece of software. Remote communications, using Windows Professional compatible software, shall allow operator to view and change all information, associated with system on color graphic displays. Operator shall be able to change all parameters in this section from off-site location including all programming of global controllers and programmable terminal unit controllers. The system shall be capable of supporting an unlimited number of web browser clients. The Web browser software shall run on any operating system and system configuration that is supported by the Web browser. User log-on identification and password shall be required.
6. Use Broward College's standard sensor and process signals.
7. System shall periodically gather energy extended log data stored in the field equipment and archive the information.
8. System software shall be capable of graphing the Energy log data.
9. Provide basic operator training for a minimum of 3 persons, as required, up to 24 hours. Demonstrate complete operating system to Owner's Representative.

23 09 25 | VARIABLE FREQUENCY DRIVES

All VFD's shall comply with latest IEEE 519 – "Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems", and the latest applicable standards of ANSI, NEMA and the NEC.

1. All VFD's shall be manufactured by Yaskawa. Other manufacturers are not acceptable and will not be considered.
    a. VFD's shall be of the 6 pulse for motor HP <100 and 12 pulse or greater for motor HP > 100, Pulse Width Modulated (PWM) design using a two-step operation.
    b. The VFD's shall be able to start into a spinning motor.
    c. Power Factor Correction capacitors shall not be utilized to meet motor performance criteria.
    d. All VFD's programmable parameters shall be adjustable from a digital operator keypad located on the front door of the VFD,
    e. The front door of the unit shall have a "hand/off/auto" switch.

f. VFD assembly shall contain a separate, across-the-line magnetic starter, sized to match motor and arranged for manually-activated emergency use in event of VFD system failure, controlled by same input data as VFD system.

2. The service package shall include a comprehensive (replacement parts and labor) two- year warranty from date of Owner Acceptance or Substantial Completion (whichever is later) for all VFDs provided.
3. Provide a minimum of 16 hours of training for all VFDs for the Owner and Owner's maintenance personnel.

23 23 13 | REFRIGERANT PIPING, VALVES, AND SPECIALTIES

1. Refrigerant system piping shall be ASTM B280, Type ACR (refrigerant grade), dehydrated and sealed, seamless, hard drawn temper.
2. Fittings shall be refrigerant grade, wrought copper, long radius, solder joint type conforming to ASME B16.22. Joints shall be made with silver brazing alloy using a non- corrosive flux, specifically designed for silver brazing.
3. Provide refrigerant specialties, including refrigerant valves, filter-driers, moisture indicating sight glass, expansion valves, charging connections, isolation or shut-off valves, and similar items in each system.
4. Install any refrigerant piping which is below slab or grade in Schedule 40 PVC piping.
5. All pipe penetrations need to be properly sealed with a urethane sealant.

23 25 00 | HVAC WATER TREATMENT

1. Provide water treatment for all HVAC water piping systems including chilled water, heating water, glycol, and open-loop recirculating systems. Treatment shall include:
   a. Cleaning and flushing, including metal passivation. Flush and clean dirt legs and strainers.
   b. Leak testing; perform at three times (3X) operating pressure, with nitrogen, for not less than 24 hours.
   c. Chemical treatment shall be suitable for open or closed loop, fluid composition, piping and system material, and temperatures, as required.
2. Provide a Chemical and Service Program for one year following date of Substantial Completion. Contract with Owner's water treatment specialist/vendor to provide this service.

23 31 00 | METAL DUCTWORK

1. Provide complete duct systems; plenum return systems are not acceptable. Submission of SHOP DRAWINGS is MANDATORY and shall include complete data on all prefabricated duct and fittings; duct sealing materials; duct joining and seaming methods; and all other items. Shop drawings shall also include partial plans for mechanical equipment rooms, and congested areas; at a minimum ¼" per foot scale. All duct dimensions shall be nominal internal dimensions; account for insulation and other items affecting clearances.
2. All ductwork, fittings, and accessories, including materials, shall conform to the latest edition of SMACNA "HVAC Duct Construction Standards, Metal and Flexible" for the pressure and velocity classification required. Provide duct of galvanized steel unless required by system or application. Provide Type 304 stainless steel ductwork for chemical fume hoods.
3. All horizontal ductwork on this project shall be supported from the structure. Where a horizontal fire-rated ceiling assembly is between the ductwork and structure, that is connected to the structure all duct hangers and supports shall be carefully coordinated with the fire-rated assembly to maintain the existing rating at the completion of the hanger installations.

4. Interior of ductwork/sheet metal plenums visible through registers, grilles, or diffusers shall be painted flat black.
5. Do not route ductwork through transformer vaults and electrical equipment spaces and enclosures, and data equipment rooms.
6. Provide all curved elbows with radius ratios of not less than 1.5 unless otherwise shown. Provide all mitered elbows with turning vanes.
    a. Connect flexible ductwork to collars on rigid ductwork and diffuser collars and terminal devices with stainless steel worm gear driven type locking clamps. Stainless steel ductwork shall be secured with stainless steel bands and clamps only. Plastic Cable or "ZIP" Ties are not permitted to connect ductwork.
    b. Flexible duct between rigid duct and diffusers shall be a MAXIMUM of 6 feet in length and shall be fully extended with a maximum equivalent of (2) 90 degree bends (no bend shall be made with centerline radius of less than one duct diameter).
    c. Flexible duct shall be supported at ends and at each 90 degree bend. Maximum permissible sag is 1/2 inch per foot of spacing between supports.
7. Hangers and supports shall comply with latest applicable SMACNA construction standard.
8. Tape is not allowed to achieve seal class on ducts. Use mastic or a combination of mastic and embedded fabric: Use mastic/mesh/mastic as a sealant where pressure/velocity classification is equal to and exceeds P/VC-3, and where any spaces between metal surfaces at transverse joints or longitudinal seams or duct wall penetrations exceeds 1/16-inch.
9. LEAKAGE TESTING:
    a. Leak test the following duct systems:
        i. All rigid ducts which are directly connected to air moving device (air handling unit, exhaust fan, supply fan or similar air moving equipment).
        ii. All rigid ducts which are part of a supply, return, outside and/or exhaust air system.
    b. Duct systems shall be constructed so that leakage does not exceed 5.00% of the air quantity handled by the respective fan, measured a test pressure which is equal to the pressure/velocity classification of the duct system.
10. Duct types shall be as follows:
    a. Supply/Discharge Ductwork from VAV AHU's to the inlet of each VAV terminal unit - High/Medium pressure ductwork/Seal Class A.
    b. Supply Ductwork downstream/discharge side of the VAV terminal units or fan-coil units, or single-zone AHU's – Low pressure ductwork/Seal Class C.
    c. Toilet and Ventilation Exhaust Ductwork – Low pressure ductwork/Seal Class C.
    d. Return and Relief Air Ductwork – Low pressure ductwork/Seal Class C.
    e. O/A Ductwork – Low pressure ductwork/Seal Class C.

23 33 00 | AIR DUCT ACCESSORIES

1. Provide all necessary duct system accessories to assure proper balance, quiet and draft- free distribution and conveyance, and minimization of turbulence, noise and pressure drop for all supply return, exhaust and ventilation air quantities indicated.
2. Coordinate all items affecting the duct systems including but not limited to the following items: air handling units, exhaust fans, supply fans, sound attenuators, duct mounted coils, access panels air distribution devices, fire dampers, outside air louvers, hoods, filters, roof curbs, structural framing, roof construction, and roofing.

3. SHOP DRAWINGS - Include complete data on: flexible connectors; manual volume dampers including operating hardware; extractors; turning vanes; automatic shutters and all other items.
4. Flexible duct connections shall be at least 4 inches long.
5. Splitters shall be constructed of at least the same gauge galvanized steel as the duct wherein they are used, but not less than twenty-two (22) US gauge. Use in low pressure duct systems only.
6. Metal turning vanes - Provide permanently fixed type in all elbows, bends and tees of low velocity ducts, conveying air at greater than 700 fpm average velocity, and in high pressure ducts of adequate rigidity and strength to be completely flutter proof. Provide air foil type in all mitered elbows, mitered bends, tees, with 24 gauge rails and hollow vanes.
    a. Barber-Colman "Airturns"
    b. Tuttle and Bailey "Ducturns"
    c. Dura-Dyne "VR"
    d. Titus
    e. Anemostat
    f. Metalaire.
7. Provide extractors at rectangular branch duct take-offs in low pressure duct systems only. Extractors shall be multi-vane, adjustable, not cause objectionable noise or pressure drop, and allow adjustment of the deflectors from outside the completed ductwork without necessity for puncturing or otherwise penetrating ductwork and/or its vapor barrier.
    a. Titus Model AG-45 or AG-225 Volume Extractor
    b. Tuttle & Bailey Type VCL or VLK Vectrol
    c. Waterloo Type DTM or DT2M Extractor
    d. Anemostat "DTB" or "DTA" or Young Regulator "890" or 890A".
8. Provide manual volume dampers in the low-pressure air distribution system(s) (including ductwork, return air plenums, etc.) to allow complete balancing of the air supply, return, ventilation and exhaust system(s), including at duct branch take-offs. These are in addition to dampers integral with grilles, registers, diffusers, or other air inlet or outlet.
    a. Dampers shall be flutter-proof with 8" maximum blade width; multi-blade dampers shall be opposed blade type. Damper shall be fully adjustable, with locking device, from outside the completed ductwork without necessity for puncturing or otherwise penetrating the ductwork and/or its vapor barrier.
    b. Provide at a point in the ductwork which is a sufficient distance upstream from an outlet (or downstream from an inlet) to attenuate objectionable noise due to damper throttling and to preclude adverse effects on the distribution device.
        i. Dampers in ducts which are exposed or located above "lay-in" or "accessible ceilings": Young Regulator Company Model 817 or equivalent.
        ii. Dampers in ducts concealed above plaster ceilings or behind dry wall construction: Young Regulator Company Model 817A or equivalent.
    c. Provide low pressure duct access doors for each manual and motorized damper, fire damper; smoke damper, electric duct heater, airflow measuring station, other equipment requiring periodic inspection or maintenance, and where access is otherwise necessary.
    d. Factory prefabricated double wall insulated type of same gauge as duct in which it is installed or 24 US gauge, whichever is greater, galvanized steel with adjustable tension catches and shall be completely gasketed around their perimeters.

e. Minimum size shall be as large as is compatible with duct size but not less than the following (provide larger sizes if necessary to permit proper access operation): (Max. Duct Dimensions: Access Door Size)
   i. 11" and less: as large as possible.
   ii. 12" through 16": 12" x 16"
   iii. 17" and over: 16" x 24"
f. Doors shall be Ventlok "Access Doors". Install in accordance with manufacturers' recommendations using Ventlok #360 sealant or equivalent.
g. Test openings - Provide gasketed capped test openings for test equipment (pitot tubes, etc.) on the entering and leaving sides of air handling units and other air handling equipment and heating coils. Ventlok #699-2 or equivalent. Pre-fabricated duct connections - At Contractor's option, prefabricated duct connections as manufactured by Ductmate (or approved equal system) may be used in locations and applications for which the duct connection system is recommended. Use of these connections must meet or exceed specified duct construction quality as related to structural rigidity, pressure, accessibility and other such requirements.

9. All accessories shall conform to the latest editions of applicable SMACNA construction standards.
10. All accessories installed in double-walled ductwork shall match the material and insulation requirements for double-walled ductwork.

23 33 13 | FIRE DAMPERS

1. Fire dampers shall comply with Underwriters Laboratories (UL) Standard 555 and bear the UL test label.
2. Provide a mock-up of each type of fire damper installation in a one-hour fire wall. The mock-ups shall contain all required framing, retaining angles, sleeves, caulking, drywall and other appurtenances as shown on the details and/or the manufacturer's installation instructions. After fabrication the mock-ups shall be approved by the Architect/Engineer. The mock-ups shall remain on the project premises to be used for reference and training purposes.
3. Provide multi-blade type fire dampers in ducts at grilles and registers where required. Provide curtain type fire dampers where required at all other locations.
4. Curtain-type fire dampers
   a. Fire dampers shall be constructed with casings of 11 gauge galvanized steel with bonded red acrylic enamel finish interlocking type damper blade assembly, and fusible link rated at 160- 165oF unless noted otherwise on the drawings. Provide factory furnished duct installation sleeve. Sleeve shall be minimum 16 gauge for dampers up to 36" wide x 24" high and 14 gauge for sizes exceeding 36" x 24". Dampers shall be Style "B", 100% full duct opening.
   b. Acceptable manufacturers are:
      i. Prefco
      ii. American Warming & Ventilating, Inc.
      iii. Ruskin Mfg. Co.
      iv. Nailor Hart
      v. Louvers and Dampers and Air Balance, Inc.
      vi. Safe Air
      vii. Greenheck
5. Multi-blade type fire dampers
   a. Provide multi-blade type spring-driven fire dampers with casing constructed of 10-gauge galvanized steel with

bonded red acrylic enamel finish, fusible link 160- 165^{0}F (71-74^{0}C), and matching factory furnished installation sleeve.
   b. Acceptable manufacturers are:
      i. Nailor Hart
      ii. Ruskin
      iii. Louvers and Dampers
      iv. American Warming & Ventilating
      v. Prefco
      vi. Air Balancing, Inc.
      vii. Safe Air
      viii. Greenheck.
6. Provide access doors to facilitate re-linking of fire and fire/smoke dampers.
7. Adhere strictly to damper manufacturer's instructions.

23 33 19 | SOUND ATTENUATORS

1. Provide factory fabricated sound attenuators where required. Specify required actual minimum attenuation (in decibels) for the indicated octave bands at the design conditions.
2. Shop drawings shall include complete data on: dimensions, airside pressure losses, dynamic insertion losses, regenerated sound level (i.e. self-noise or airflow generated noise), performance certification, performance test method, and materials of construction.
3. Acceptable Manufacturers:
   a. Rink Division of Krueger/Phillips Industries.
   b. Commercial Acoustics.
   c. Transonics.
   d. Industrial Noise Control, Inc.
   e. Titus.
   f. United McGill Corporation.
   g. Ruskin Sound Control.
   h. Industrial Acoustics Company. (Basis of Design)
4. Construction shall include:
   a. The outer casings of the attenuators shall be constructed of not less than 22-gauge galvanized steel with seams lock formed and mastic filled, or shall be continuously welded.
   b. The interior partitions of the attenuators shall be constructed of not less than 24 gauge galvanized perforated steel.
   c. The silencer filler material shall be inorganic mineral glass fiber of a density sufficient to obtain the specified acoustic performance and shall be packed at not less than five percent (5%) compression to prevent the formation of voids due to vibration or settling. The material shall be inert, vermin and moisture proof, and shall comply with the flame spread and smoke developed ratings of NFPA 90A.
5. Performance - Acoustic and aerodynamic performance shall be tested and certified in accordance with ASTM E477-84 Standard Method of Testing Duct Liner Material and Prefabricated Silencers for Acoustical and Airflow Performance. Airflow pressure drops shall be tested in accordance with AMCA Standards.

6. Where multiple sound attenuators are assembled, by either the manufacturer or the installer, into attenuator banks, the individual attenuators shall be securely fastened together as recommended by the manufacturer. All joints between the assembled attenuators shall be sealed to prevent air leakage as recommended by the manufacturer.

23 34 00 | HVAC FANS

1. Provide time-of-day schedule for all exhaust fans associated with AHU's. Exhaust fans shall not operate during AHU pre-conditioning sequences or unoccupied periods.
2. SHOP DRAWINGS shall include complete data on: fan external static pressure, fan rpm, motor rpm, fan tip speed, fan size, fan performance tables or curves showing all possible operating selection points for each fan size (including rating certification), fan brake horse- power, motor horsepower and electrical characteristics, sound level, curb adapter, fan accessories, Fan design mounting meeting the Miami-Dade requirement for 144 MPH wind resistance without the need for cabling tie downs, etc.. The data shall take the form of engineering data sheets, clearly depicting specification compliance, and a complete schedule worked up by fan number.
3. All fans shall be AMCA certified for both sound and performance ratings. Provide backward inclined fans where possible.
    a. Greenheck Fan and Ventilator Corporation is preferred as basis-of-design manufacturer,
    b. Loren Cook Company
    c. Penn Ventilator Company.
4. Where required, connect inlet ducts to roof curb inlet flanges.
5. Provide unit-mounted disconnect switches wherever possible to avoid additional roof- mounted racks or structures.

23 36 16 | TERMINAL UNITS: VAV, SINGLE-INLET, ELECTRICAL HEATING COIL

1. Provide single inlet, variable air volume (VAV) terminal units.
2. Shop drawings: Refer to Section entitled "General Mechanical Provisions". Include: complete performance data at the scheduled operating conditions; dimensions; performance data; pressure losses; descriptions; discharge and radiated sound power levels at the stated conditions.
3. Acceptable Manufacturers:
    a. Trane. (shall be Basis of Design)
    b. Enviro-Tech
    c. Titus.
    d. Krueger.
    e. Metalaire.
4. Terminology: The word "box" or "terminal unit" used throughout this section without any modifying adjective shall mean the entire terminal unit assembly including all other accessories integral therewith, unless otherwise indicated. Terminal units may be referred to as "TU".
    a. Noise criteria:
        i. The maximum allowable NC level in any occupied space shall not exceed NC20 as a result of radiated or discharge noise from any terminal unit.
5. Select terminal units for maximum air discharge within 65% to 75% of the unit rating so that field adjustment of maximum indicated discharge air quantity may be made plus and minus 15%.
6. Terminal units intended for full shut-off operation shall not have air leakage of more than 2% of nominal box capac-

ity when inlet pressure is 6.0 inches W.G.

7. Maximum allowable static pressure drop across the control box portion of any terminal unit (i.e., excluding any applicable companion sound attenuator or heating coil) shall not exceed 0.20 inches W.G. Maximum allowable minimum operating pressure of the entire unit shall not exceed 0.50 inches W.G.
8. Terminal units shall be double-wall, galvanized steel or aluminum casing; insulated between the outer and inner wall with 1-inch thick high density fiberglass insulation to prevent condensation (comply with NFPA 90A); acoustically treated to reduce noise level; air quantity indicator; access panel(s) for complete access to all parts of the assembly which may require service, maintenance and repair. The solid inner liner shall be constructed of 26-gage galvanized steel.
9. DDC controllers shall be Schneider Electric, Inc. and shall be factory-mounted in each VAV terminal including damper motors and similar items. Terminal manufacturer shall coordinate with Schneider Electric, Inc.
10. Provide each terminal unit having electric heat with an integral, factory-mounted electric heating coil and control panel with integral disconnect on the door of the heating coil control panel. Coordinate with Division 26 for power and clearances.
11. Select controls for pressure independent operation: units shall be able to maintain constant discharge flow for any given set-point with any variation in inlet static pressure between 0.2 inches W.G. and 6.0- inches W.G. and shall be factory set for design air flow and for minimum air flow.
12. Locate terminals so that access for repair, maintenance and adjustment is easily facilitated without removal of other permanently located items which are in the immediate vicinity of boxes (this excludes removable ceiling panels, removable air distribution devices attached to flexible ductwork and other similar items). Maintain minimum access clearances required by electrical codes.
13. No terminal unit outlet (including companion sound attenuator, if needed) shall be nearer than 60-inches from the first flexible duct connection take-off to the first downstream air distribution device.

23 37 13 | AIR DISTRIBUTION DEVICES

1. Insulate air distribution devices to prevent condensation formation.
2. Acoustical: Noise produced at each diffuser, register, grille or other air distribution device shall not exceed a noise criteria level of NC 20 based on sound pressure levels in db re 0.002 microbars unless otherwise indicated. Coordinate air distribution devices, sound attenuation measures and equipment actually provided to ensure that this design constraint is not exceeded by the system installed.
    a. Exceptions: Any particular rooms or areas which are normally occupied by other than maintenance staff or service staff and which may be noted on the drawings as requiring lower NC criteria.
    b. Pressure Drop: Pressure drop across any air distribution device shall not exceed 0.15 in W.G. static pressure unless otherwise indicated.
3. All air distribution devices shall be submitted in a detailed air device schedule indicating the specific performance requirements for each air device. No exceptions. The schedule shall include the dimensions, airflow, static pressure, NC levels, air outlet velocity, and room location.
4. Acceptable Manufacturers:
    a. Titus.
    b. Metalaire.
    c. Price.

   d. Krueger.
5. Other requirements:
   a. Each air distribution device which has a portion thereof (frame, core, etc.) exposed to view in the finished area shall have a factory applied finish which matches and is compatible with the color of the surrounding surface on which the device is installed. Colors must be approved by Architect prior to device fabrication. Duct interiors, air distribution device interiors, and blank offs shall be painted with flat black enamel to eliminate light reflectance from the inside of the duct system. Visible fasteners shall be furnished with the air distribution equipment and be finished at the factory to match the finish on the grille, diffuser, or register in which they are to be used.
   b. All louvers, dampers and/or shutters shall be rated by their manufacturer in accord with AMCA Standard 500-74.
   c. Outside air inlet dampers ahead of AHUs shall be anodized aluminum with stainless steel hardware.
   d. All dampers, blank-off baffles and other companion devices which form an integral part of air distribution device shall be factory made items produced by the manufacturer of air distribution device.
   e. Louvers may be specified in another division but for reference may also be indicated on mechanical drawings. Include louver specification section number in the louver schedules.
   f. Door grilles may be specified in another division but for reference may also be indicated on mechanical drawings. Include door grille specification section number in door grille schedule.
   g. All devices shall comply with the applicable portions of the Air Diffusion Council (ADC) Equipment Test Code 1062R4 "Certification, Rating and Test Manual", the Air Movement and Control Association, Inc. (AMCA) Standard 500 "Test Method for Louvers, Dampers and Shutters" and the "National Fire Protection Association" (NFPA) Standard 90A "Installation of Air Conditioning and Ventilating Systems".
   h. Provide ceiling and/or linear diffusers with border styles that are compatible with adjacent ceiling systems, and that are specifically manufactured to fit into ceiling module with accurate fit and adequate support.
   i. Diffusers, grilles and registers installed in fire rated assemblies shall be constructed of steel.
6. Lay-in diffusers shall be supported by the inverted T-bar suspension system, but all connected ducts shall be supported independently of the ceiling from the building structure. Hard surface ceiling, sidewall, and duct mounted grilles, registers shall be mounted securely to the surface and duct system flanges using finish screws.
7. Furnish to Owner 3 operating keys for each type of outlet and inlet that require them.

23 41 00 | AIR FILTERS AND ASSEMBLIES

1. Provide air filtration for all equipment supplying air to occupied spaces. Provide MERV 8 pre-filters and MERV 13 final filters for each air handling unit. When equipment is not furnished with an air filter section, provide a separate air filter housing assembly. Air filters shall be a standard size, 24" x 24" x 2" or 12" x 24" x 2" for MERV 8 and 24" x 24" x 4" or 12" x 24" x 4" for MERV 13, unless approved by Broward College.
2. Select air filtration assemblies to pass applicable air quantities at velocities and pressure drops which are within manufacturer's recommended operating ranges.
   a. Acceptable Filter Manufacturers:
      i. Camfil Farr
      ii. Continental
      iii. American Air Filter
      iv. Cambridge

v. Flanders
vi. Purafil.

b. Filter Housing Manufacturers shall be the same manufacturer as the applicable filters or same manufacturer as the air handling unit in which installed, whichever manufacturer is applicable.
c. Standard or pre-filters shall be extended surface, pleated panel disposable type, MERV 8 per ASHRAE 52.2 test method. Basis of design shall be Camfil Farr AeroPleat IV; MERV-8 High Capacity Pleated Panel Filter.
d. Final filters shall be high performance, extended area, pleated, 4-inch thick, disposable type, MERV 13 per ASHRAE 52.2 test method, listed by Underwriters' Laboratory as UL 900-Class 2. Filter shall consist of a filter element, media retainer holding frame and sealer frame. Basis of design shall be Camfil Farr AP-Thirteen SC.
e. Provide washable aluminum-mesh filters in outside air intakes prior to airflow measuring stations, and for bulk OA systems such as kitchen hood make-up air or EHPA supply air.
f. Access: Filter sections shall be designed for side service access unless otherwise indicated.

3. Provide for easy access to and removal and replacement of filters. Provide access doors and/or panels as necessary.
4. Provide an original filter set and two (2) spare filter sets for each unit having an air handling equipment filter assembly specified above.

23 44 00 | AIR PURIFICATION SYSTEMS

1. Provide bi-polar ionization air purification systems in each air-handling unit that is not a dedicated outdoor air supply unit. Ion emitters shall be Type 316 stainless steel needle- point style emitting positive and negative ions; mesh tubes and recessed emitters are not acceptable. Emitters shall be mounted inside the AHUs.
2. Provide ion detectors for each system with interface to Building Automation System to independently indicate operation of system.
3. Provide controls to operate system during operation of AHU.

23 70 00 | CENTRAL HVAC EQUIPMENT

1. Air handling unit shall be single path and selected for custom dimensioning to meet the clearances in each mechanical room.
2. Supply fan performance shall be certified as complying with ARI Standard 430-89. Coil capacities, pressure drops and selection procedure shall be certified in accordance with ARI Standard 410-91.
3. Each air handling unit shall carry a full five-year parts & labor warranty from TOC.
4. All air handling units shall be of the same manufacturer. All components in factory- furnished air handling units shall be factory-assembled and factory-tested prior to shipping. Air-handling units shall have the following features:
   a. Sectional, insulated, double wall casing with hinged, insulated access doors for each section; separate fan and coil sections, galvanized 18 gauge outer and 20-gauge inner skins with R13 foam insulation.
   b. Insulated, 20 gauge stainless steel, double wall pitched drain pan extending a minimum of six inches downstream of the coil face; insulation 1 inch thick.
   c. Up to two, aluminum blade Class II single width, single inlet direct drive, plenum- type fans. Fan wall configuration may be used with Owner's prior approval.
   d. Copper tube, aluminum fin Coils leak tested to 200 PSIG and designed for 300 PSIG working pressure; continuous seamless copper tube with aluminum plate fins not exceeding 12 fins per inch; minimum 16-gauge, Type

304 stainless steel casing with copper headers brazed to tubes with threaded connections. FACTORY- APPLIED Electro-fin coating.

e. Filter sections with gasketed rails for 2" thick pleated media MERV 8 pre-filter and a 12" thick pleated media MERV-13 final filter. Provide initial start-up set of filters, one complete set of MERV 8 filters for test and balancing and complete set of pre- filters (MERV-8) for all AHU's to provide one complete pre-filter change-out.
f. Piping, isolation valves, and flanges or unions shall be arranged for unobstructed removal of the coil .
g. Fans shall be internally isolated free of vibration and excessive noise.
h. Flange or collar duct connections for flexible duct connection to the supply and return duct connections to prevent transmission of vibration into the duct system.
i. Six (6)-inch galvanized steel, full perimeter frame channels/rails.
j. Acceptable Manufactures:
    i. Trane Performance Climate Changer (Basis of Design).
    ii. Carrier 39M
    iii. Daikin Vision

24-25

DIVISIONS 24-25
RESERVED FOR FUTURE EXPANSION & INTEGRATED AUTOMATION

NOT USED

BROWARD COLLEGE®

26 00 00 | ELECTRICAL DESIGN AND GENERAL REQUIREMENTS

1. Design Approach: Incorporate life-cycle considerations and a holistic approach with respect to energy conservation, properly proportioned demand load considerations, emergency power requirements, and power quality needs. Avoid over-designing of systems.
2. Related Work: All Electrical work to be performed shall be reflected in Division-26 specifications and/or on the Electrical Drawings. Any required electrical work related to other Divisions of the specifications shall be shown on the Electrical Drawings and specified in Division-26. The Architect/Engineer shall provide notes on drawings and on specifications for the contractor to provide a complete bid with all of the scopes of work shown on drawings set and specifications book.
3. Existing Drawings: Drawings of existing facilities and underground utilities or systems may not be accurate and shall be considered as informational only. Architect/Engineer/CM shall verify field conditions (above the ceiling, behind existing furniture, etc.). The Architect/Engineer shall coordinate with the College and include fees in design proposal for any pre-design electrical metering and site walkthroughs.
4. Renovations: Prior to commencing any work, the Architect/Engineer shall request from BC a maintenance testing report, done in the past 6 months, for the following existing systems. The intent of this action is to allow BC to handle any deficiencies, errors or warning signs from any of the systems during or prior the renovation project so the space/building is left without any deficiencies, error or waning signs after completion of renovation project.
    a. Fire Pump
    b. Fire Alarm
    c. Domestic Water
    d. Sanitary Water
    e. Chilled Water
    f. Generator
    g. BAS System
5. Communications and Data Systems: The Architect/Engineer shall provide full services for a complete voice/data/video structural cabling system including but not limited to raceway, boxes, cabling, outlets, racks, plywood, patch panels, switches, UPS. Coordinate with the College all additional required location of data drops, not limited to wall outlets, wireless access points, projector, etc. and all power requirements for rack mounted equipment.
6. Equipment Space: The Architect/Engineer shall coordinate component dimensions for equipment located above ceilings, underground and in HVAC rooms and verify adequate space is available for all trades with their required working clearances.
7. Raceway and Boxes: The Architect/Engineer shall indicate on the plans all conduits 3" or larger, all pull boxes 12" x 12" or larger and to scale.
8. Branch Circuit Design: Where anticipated loads are comprised of a high proportion of equipment utilizing switched-mode power supplies, design in conformance to NEC.
    a. Not more than six (6) student workstations/computers shall be connected to one (1) 20A, 120V, and 1phase branch circuit. Coordinate with the College and take into consideration the diversity of branch circuits for specific workstations. If one branch circuit gets interrupted, it shall not limit the functionality of the majority of the student workstations in the same room.
    b. If the lighting load allows it, not more than three (3) classrooms shall be connected to one (1) 20A, 120V or 277V, and 1phase normal lighting branch circuit.

c. One (1) emergency lighting branch circuit for every 4,400 square feet.
d. Segregate the lighting branch circuits for the following groups:
    i. Common Spaces: Corridors, lobbies, restrooms, cafeterias.
    ii. Instructional/Meeting Spaces: Classrooms, lecture halls, conference rooms, private offices.
    iii. Back of House Spaces: Mechanical/Electrical rooms, janitors closets, roof, exterior mounted building.
e. Segregate the receptacle branch circuits for the following groups:
    i. Common Spaces: Corridors, lobbies, restrooms, cafeterias.
    ii. Teaching/Meeting Spaces: Classrooms, lecture halls, conference rooms, private offices.
    iii. Back of House Spaces: Mechanical/Electrical rooms, janitors' closets, roof, exterior mounted building.

9. Isolated Ground: Isolated ground shall be avoided at all times. If it's recommended by the equipment manufacturer, the Architect/Engineer shall coordinate these requirements with BCPM.
10. Products: Equipment and materials of the same type of classification and use for the same purpose shall be products of the same manufacturer. ie. Motor controllers, disconnects, switchgear, panel boards, raceway, wires, devices, etc. shall be the same manufacturer for each type of product. Match equipment manufacturer for existing conditions. The Architect/Engineer shall incorporate this requirement into the construction documents. Deviation from this requirement can be accepted if coordinated and approved by the College.
11. General Room Requirements: The Architect/Engineer shall provide the following requirements as a minimum for each general space listed. Coordinate with BCPM any additional requirements.
    a. Classrooms, Conference Rooms, and Instructional Spaces:
        i. Communication Outlet: Refer to 27 05 00 Common Work Results for Communications.
            1. One (1) communication outlet location must be located by the teacher workstation inside the FSR-type box.
            2. One (1) communication outlet location must be located by each student computer workstation.
            3. One (1) floor mounted communication outlet for each conference room table.
        ii. Multi-media: Refer to Appendix 01 03 Audiovisual Standards.
            1. Coordinate with the College AV standards and provide connectivity for classroom multi-media devices in an FSR-type box with power, audio and video infrastructure inside the box. Location of the box shall be recessed on the wall next to the teacher podium. Add all of the College AV mounting/elevation details to the construction documents.
            2. One (1) floor mounted media outlet tied to projection and TV for each conference room table.
            3. Audio-visual screens shall be electrically powered and controlled from a new wall switch.
        iii. Electrical Outlet Requirements:
            1. One (1) duplex convenience receptacle outlet at each wall. Coordinate how many of these outlets will be controlled (plug load controls) by the lighting controls.
            2. One (1) duplex receptacle outlet for the printer/copier if needed.
            3. One (1) duplex receptacle outlet must be located by the teacher workstation inside the FSR-type box.
            4. One (1) floor mounted quad receptacle outlet for each conference table.
        iv. Lighting: Refer to 26 51 00 Lighting Systems.
            1. Provide infrastructure consisting of lighting with motion detection sensors, emergency lighting, audiovisual, voice, data and electrical outlets and connections and fire alarm.
            2. Classroom lighting fixtures shall be oriented perpendicular to the white board.

3. Classroom lighting shall be capable of two levels of lighting. One mode at full level lighting and one mode at reduced lighting level. The two levels of lighting shall switch from front of classroom to back of classroom to allow for the darkening of the front of the room for audio/visual presentations.

b. Science Lab Classrooms and Specialty Classrooms
   i. Communication Outlet: Refer to 27 05 00 Common Work Results for Communications.
      1. One (1) communication outlet location must be located by the teacher workstation inside the FSR-type box.
      2. One (1) communication outlet location must be located by each student computer workstation.
      3. Location and quantity of communication outlet locations to be used by students in the science lab classroom and specialty classrooms will be determined by the BCPM at time of design.
   ii. Multi-media: Refer to Appendix 01 03 Audiovisual Standards.
      1. Coordinate with the College AV standards and provide connectivity for classroom multi-media devices in an FSR-type box with power, audio and video infrastructure inside the box. Location of the box shall be recessed on the wall next to the teacher podium. Add all of the College AV mounting/elevation details to the construction documents.
      2. One (1) floor mounted media outlet tied to projection and TV for each conference room table.
      3. Audio-visual screens shall be electrically powered and controlled from a new wall switch.
   iii. Electrical Outlet Requirements:
      1. Provide electrical power to all lab tables from slab or floor below. Ceiling drops for electrical power shall not be used under any circumstances without the College written authorization.
      2. Provide emergency shutdown for electrical and other utilities (water and gas) being used for the room. Provide power and control modules for all the valves.
      3. One (1) G.F.I. duplex receptacle outlet for every communication outlet when located above lab counter work area.
      4. One (1) duplex convenience receptacle outlet at each wall. Coordinate how many of these outlets will be controlled (plug load controls) by the lighting controls.
      5. One (1) duplex receptacle outlet for the printer/copier if needed.
      6. One (1) duplex receptacle outlet must be located by the teacher workstation inside the FSR-type box.
   iv. Lighting: Refer to 26 51 00 Lighting Systems.
      1. Provide infrastructure consisting of lighting with motion detection sensors, emergency lighting, audiovisual, voice, data and electrical outlets and connections and fire alarm.
      2. Classroom lighting fixtures shall be oriented perpendicular to the white board.
      3. Classroom lighting shall be capable of two levels of lighting. One mode at full level lighting and one mode at reduced lighting level. The two levels of lighting shall switch from front of classroom to back of classroom to allow for the darkening of the front of the room for audio/visual presentations.

c. Administrative Offices
   i. Communication Outlet: Refer to 27 05 00 Common Work Results for Communications.
      1. Minimum of one (1) communication outlet location at each office space.
   ii. Electrical Outlet Requirements:
      1. One (1) quad receptacle outlet for each computer workstation.
      2. One (1) duplex receptacle outlet for the printer/copier if needed.

12. Voice Evacuation System: Provide for public assembly areas such as lecture halls, auditoriums, and libraries or as required by applicable code. For fire alarm systems, if the code doesn't require a voice evac system, coordinate with the College if the new system should be of a voice evac system, otherwise new system shall match existing horn system.
13. Equipment list with electrical requirements and connections must be provided prior to design and provided on the drawings. Coordinate all proposed equipment requirements.
14. Aluminum products and materials including, but not limited to, raceways, wires, boxes, and fittings are not permitted for electrical work.
15. Quality Work: Contractor shall maintain the highest level of quality in the performance of the work. The execution of the work in the installation of electrical equipment shall be performed in a neat and workmanlike manner as required by the current edition of NFPA 70, National Electrical Code. The College and the Code authorities having jurisdiction will strictly enforce this requirement "Area practice" does not relieve the Contractor of the responsibility for conforming to the stated and shown Contract Document requirements.
16. Coordination: Contractor shall coordinate work specified in other Divisions of the specifications that require electrical installation with the requirements of Division 26 and the contract drawings to ensure all subcontractors involved work together to provide a complete, operational system at no additional cost to the College.
17. Exterior Equipment: All exterior electrical equipment and related supports and fasteners shall be stainless steel, NEMA 4X. The grade of stainless steel shall be a minimum of grade 316.
18. One-line diagram: The Architect /Engineer shall provide in the contract documents a one-line diagram illustrating the scope of work related to the electrical distribution and all new feeders' sizes shall be indicated on the one-line diagram and not on a feeder schedule. Diagram shall also include panel ratings and if it contains a main circuit breaker or main lugs only.
19. Demand Load and Spare Capacity: To ensure maximum flexibility for future systems changes, the electrical system must be sized for the demand load with additional spare capacity as follows: Demand factors identified in NFPA 70, Chapter 6, must be applied.
    a. Panelboards for branch circuits: 50 percent spare ampacity and 35 percent spare circuit capacity.
    b. Panelboards serving lighting only: 50 percent spare ampacity and 25 percent spare circuit capacity.
    c. Switchboards and distribution panels: 35 percent spare ampacity and 25 percent spare circuit capacity.
    d. Main switchgear: 25 percent spare ampacity and 25 percent spare circuit capacity.
    e. All distribution equipment ampacities must be calculated in accordance with NFPA Article 220 and as modified in this chapter. If the addition of 25 or 35 percent spare circuit capacity results in the need for a two-section panel, the design engineer must limit the spares to the capacity of the panel in question and assign sufficient space in the electrical closet layout to accommodate a future panel and associated transformer.
    f. All panelboards must be fully populated with breakers of a size and rating of breakers actively being used in the panelboard.
    g. Spare overcurrent devices must be provided for the installation of future protective devices.
    h. Before adding the spare equipment ampacity to account for future load growth, it is important that the load study reflect actual demand loads rather than connected loads.
20. Utility Coordination: A detailed load study, including connected loads and anticipated maximum demand loads, as well as the estimated size of the largest motor, must be included in the initial contact with the local utility company to prepare its personnel for discussions relative to the required capacity of the new electrical service.

For renovation projects, all added loads to the systems must be coordinated with the utility company and a letter indicating the available short circuit fault current shall be requested to properly size the AIC ratings of the electrical distribution equipment.

21. Site Requirements: The routing of site utilities and location of manholes must be determined early in the design process in coordination with the site civil engineer. The designer must coordinate with the utility company to determine the capabilities, rate structure options, and associated initial costs to the project and must evaluate the available utility service options.
22. Contractor's As-builts: The Architect/Engineer to include in the contract documents a statement that indicates The Contractor to include as part of the asbuilt package the submittal of contractor asbuilt drawings in Autocad files indicating the location of all devices, boxes, raceway and any other point-to point connections.
    a. The intent is to have, at all times on site during the construction, a set of construction documents (plans and specifications) with the most up to date revisions.
    b. The Architect /Engineer to include in the contract documents a reference to the BC As-Built Requirement standard.
    c. The Architect/Engineer to send to BCPM an electronic copy (CAD file) of all of their plans included with proper external references to share with awarded contractor for their development of asbuilts.
    d. The Architect/Engineer shall update their set of construction documents upon any changes to their plans and specifications not limited to the following:
        i. Unforeseen field conditions changes
        ii. Shop drawing changes
        iii. Construction specification changes
        iv. RFI changes
        v. Re-location changes
        vi. Owner requested changes
        vii. Inspection changes

26 00 50 | ELECTRICAL AND COMMUNICATION ROOM REQUIREMENTS

1. Space: Maximum allowable space shall be allotted to electrical and communications/data equipment rooms to provide ample clear space for the equipment provided and for future needs. Rooms shall be located to be serviced from an interior corridor.
    a. Rooms must be symmetrical and shall be a minimum of 10-feet by 12-feet; minimum size for closets shall be 8-feet by 10-feet. Provide a minimum of 50 percent additional wall space for future expansion. If 50 percent additional wall space is not possible, based on project space limitations, coordinate with the College to get waiver for this standard.
    b. Communications/data equipment rooms are not to be calculated as part of the 6 percent space allocation for electrical and mechanical space under State Requirements for Educational Facilities.
    c. Non-electrical utilities (i.e. Water, HVAC, etc.) are not allowed to be in this space unless servicing the room. HVAC equipment required for the space shall be ducted outside the space. The engineer shall indicate on other disciplines drawings the location of the electrical rooms with notes for other contractors to stay away from these spaces for any non-electrical utilities.
    d. Fire protection pipes that are servicing the rooms, shall be coordinated not to be above any electrical equipment.

2. Location: When possible, electrical and communications/data equipment rooms and closets should be planned to be located as centralized as possible in the scope of the work area (core of the floor). If it's not possible, the locations of these spaces shall be coordinated with the College for approval.
3. Drawings:
   a. A/E Construction drawings shall contain enlarged floor plans at 1/2-inch scale of all electrical and communications/data equipment rooms and closets showing the location of all equipment in these spaces. Plan view and elevations of each wall shall be provided. Including, but not limited to, all equipment, pull boxes, junction boxes, grounding systems and exposed conduits.
   b. The Electrical Contractor shall provide, prior to construction, shop drawings for approval by the Electrical Engineer and BCPM, containing enlarged floor plans at 1/2-inch scale of all electrical and communications/data equipment rooms and closets showing the location of all approved equipment in these spaces. Plan view and elevations of each wall shall be provided. Including, but not limited to, all equipment, pull boxes, junction boxes, grounding systems and exposed conduits.
4. Air-conditioning and Ventilation: Provide all telephone equipment and communications/data equipment rooms and closets with 24-hour air-conditioning. Provide all electrical rooms and closets with air-conditioning unless provided with positive outside air ventilation. Primary HVAC from central station and backup and after hours with a dedicated space AC system. The AC system or ductwork shall not be located within the space. The AC system shall be controlled through the Building EMS.
5. Ceilings: Provide exposed ceilings in the electrical room. Provide acoustical ceiling in communication/data rooms.
6. Lighting: Lighting in these rooms shall not have automatic shut-off controls. Provide emergency battery unit (bug-eye) where the EPSS and transfer switches are located.
7. Doors: All electrical and communications/data equipment room doors shall swing out.
8. Raceways: Terminate immediately adjacent to the cable trays or backboards. All conduit type raceways, including through the floor stubs, shall terminate in an insulated throat, lay-in lug bonding bushing (RAC01213, or equivalent).
9. Data/Communication Outlets: Provide one in each electrical distribution room.
10. Housekeeping Pads: Provide for all floor-mounted electrical equipment; minimum 4-inches high, 3000 psi concrete with no greater than a 2-inch lip chamfered edge around the equipment.

26 05 19 | LOW VOLTAGE CONDUCTORS AND CABLES

1. Separate Neutrals: Specify separate neutrals on all circuits. Shared neutrals will not be acceptable. If pre-wired furniture manufacturer requires a shared neutral, the Architect/Engineer shall coordinate these requirements with the College and provide a UL listed common trip multi-pole circuit breaker or UL listed handle ties in order to provide simultaneous trip.
2. Voltage Drop Calculations: To meet NEC recommended minimum of 3 percent voltage drop, the Architect/Engineer shall specify the following into the contract documents.
   a. Use conductor not smaller than #12 AWG for all 120V 20A branch circuits less than 60' in length from the source breaker to any device.
   b. All 120V 20A branch circuit conductors where the length is 61' to 120' from the source breaker to any device shall utilize #10 minimum throughout the circuit unless otherwise noted.
   c. All 120V 20A branch circuit conductors where the length is 121' to 240' from the source breaker to any device

shall utilize # 8 minimum throughout the circuit unless otherwise noted.

d. All 120V 20A branch circuit conductors where the length is greater than 241' from the source breaker to any device shall utilize # 6 minimum throughout the circuit unless otherwise noted.
e. Use conductor not smaller than #12 AWG for all 277V 20A branch circuits less than 140' in length from the source breaker to any device.
f. All 277V 20A branch circuit conductors where the length is 141' to 220' from the source breaker to any device shall utilize #10 minimum throughout the circuit unless otherwise noted.
g. All 277V 20A branch circuit conductors where the length is 221' to 340' from the source breaker to any device shall utilize # 8 minimum throughout the circuit unless otherwise noted.
h. All 277V 20A branch circuit conductors where the length is greater than 341' from the source breaker to any device shall utilize # 6 minimum throughout the circuit unless otherwise noted.
i. Wire size required to be increased due to distance shall be the length of the entire branch circuit from the source and to the last device connected to it.

3. Free-wired cabling is not allowed unless is beneficial to the project. The Architect/Engineer to coordinate with the College for approval of waiver of this standard.
4. Multi-tap connectors: The Engineer shall coordinate the usage of multi-tap connectors with equipment that are furnished with "pig-tail" cable connections. The engineer to add to construction documents that the manufacturers approved are Polaris and Burndy.
5. The Architect/Engineer to edit the construction specifications to include the following:
   a. Provide Stranded Class B wire and cable per ASTM B8
      i. Bus, lugs, and terminal blocks shall be copper
      ii. Aluminum wire and cable will not be permitted.
   b. Conductor Insulation: UL Type THHN/THWN, or provide UL Type THW or XHHW as appropriate for locations where installed.
   c. Color-Coding: Factory color insulation. Re identification with paint, tape or other means is not permitted.
      i. Ground leads Green
      ii. Neutral Conductors White (120/208V); Gray (277/480V)
      iii. Phase A, B, C120/208V Black, Red, Blue
      iv. Phase A, B, C 277/480V Brown, Orange, and Yellow
   d. Conductors: Run in approved conduit system regardless of voltage or insulation.
   e. Bundling: Conductors located in branch circuit panel boards, cabinets, and control equipment shall be bundled neatly and securely using plastic cable tie-wraps. Tape is not permitted as a tying method.
   f. Wires: Not more than seven (7) wires, including the equipment grounding conductor, shall be installed in a conduit run except by written authorization from the BCPM.
   g. Splices: Provide splices using hydraulic Hy-Press or approved methods for splices made in conductors #4 AWG and larger.
      i. No splicing will be permitted on fire alarm, clock, speaker, intercom, or TV systems wiring. All splicing on these types of systems shall be made in junction boxes on the proper termination strips.
      ii. Compression terminals and splices shall be installed only with a controlled cycle crimping tool.

1. Grounding Buss: Copper, minimum ¼ x 4 x 12, with 25 percent spare capacity. Provide in the Electrical Main Distribution Room and in all other Electrical Distribution rooms and separate Communication/Data rooms. The Architect/Engineer shall include this requirement to the contract document. In renovations, if existing grounding buss is used, replace the existing grounding buss to maintain 25% spare capacity after project completion.
2. Grounding Electrode Conductors:
   a. The Engineer shall provide a complete design of all equipment grounding including sizes of conductors, conduits and point to point connections. Providing a grounding symbol and NEC reference only is not acceptable.
   b. Connection and Termination: Terminate equipment grounding conductors in terminal bars, screws, or lugs expressly designed for the purpose. Connections and terminations to the main grounding electrode and common grounding electrode conductor, from one buss to the other, shall be made by exothermic welding. Everything else connected to the grounding buss can be by mechanical/reversible lug connections.
   c. Grounding conductors shall in no case, be run on the exterior of a raceway, on the building surface, or concealed in the building structure. All grounding conductors to be in conduit.
3. Grounding Buss Installation: Mount 18-inches above the finish floor of the Electrical Main Distribution Room. The engineer to provide mounting detail in the contract documents.
4. Grounding Electrode System:
   a. When available the following allowed electrodes should be part of the grounding electrode system:
      i. Water line
      ii. Building steel structure
      iii. Uffer ground
      iv. Grounding rod delta.

      The engineer shall include of the above (if applicable) to the projects, grounding detail including the size of common grounding electrode conductor and raceway used for bonding the whole system.
   b. All exposed steel needs to be bonded. (i.e. Chilled water pipes, gas pipes, compressed air pipes, fire sprinklers pipes, domestic water pipes, water heater pipes)
   c. Grounding rod delta: Provide at least (3) 10' x ¾" diameter copper-clad ground rods spaced 30' apart to form a delta for the grunding electrode. Provide test wells for each rod. The engineer to add to the construction documents for the contractor to test the ground resistance of the delta rods to be 5ohms or less without connection to the remainder of the grounding electrode system. If resistant is greater than 5pohms, the contractor shall drive additional ground rods to achieve the 5ohms or less.
   d. Interconnect grounding buss of each electrical room grounding buss with a common tie conductor of the same size as the main grounding electrode conductor.
   e. Connect the ground buss in each communications room with a minimum #3/0 copper conductor in 1-inch conduit.
5. Equipment Grounding Conductors:
   a. All low-voltage power distribution systems must be supplemented with a separate, insulated equipment grounding conductor.
   b. Minimum size of the equipment grounding conductor shall be #12 stranded copper.
   c. Grounding conductors shall in no case, be run on the exterior of a raceway, on the building surface, or con-

cealed in the building structure. All grounding conductors to be in conduit.
   d. Termination: Terminate equipment grounding conductors in terminal bars, screws, or lugs expressly designed for the purpose.
6. For secondary derived systems: Provide system bonding jumper at the transformer and size the grounding conductor that will be installed with the phase conductors (not to be confused with the grounded conductor "neutral") based on the size of the phase conductors (GEC table) NEC article 250.30 (A) (2).
7. The Architect/Engineer to edit the construction specifications to include the following:
   a. A10/32 green screw shall be used to ground all outlet boxes.
   b. Wire and Cable shall be annealed, coated stranded copper per ASTM B33 or ASTM B189 with conductivity or not less than 98 percent.

26 05 29 | HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1. Performance Requirements: Design supporting devices capable of supporting combined weight of supported systems and components. Do not use cantilever supports.
2. The Architect/Engineer shall include to the construction documents support details not limited to the following systems:
   a. Ceiling mounted lighting fixtures.
   b. Single row conduit hanger (trapeze).
   c. Single conduit hanger.
   d. Wall mounted transformers.
   e. Roof mounted disconnects and receptacles.
   f. Exterior mounted electrical distribution.
3. The Architect/Engineer to edit the construction specifications to include the following:
   a. Submittals: Provide shop drawings to the College for approval prior to fabrication and erection of electrical supporting devices for exterior equipment.
   b. General Installation: Securely fasten electrical items and their supports to the building structure
   c. The use of cantilever supports is not allowed.
   d. The contractor shall ensure that all trapeze hangers are supported from a minimum of two (2) points of the building structure.
   e. When a specific mounting/support is required and is not detailed on the contract documents, but it is recommended by the contractor, a submittal for review shall be provided to the College and Engineer for approval
   f. General Material: Provide cold-formed steel with corrosion-resistant coating. The contractor to use 316 stainless steel, U-channel system components for outdoor and damp locations.
   g. All hangers and supports that are located within 10 feet of a chiller plant chemical treatment system are to be stainless steel.
   h. Raceway and Cable Supports: Manufactured Clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.
   i. Environment: All materials need to be suitable for the environment they are installed in. They should be provided as corrosion resistant if installed in a wet, damp or outdoor location.
   j. Support Clamps for PVC Raceways: Where required to be use indoor/exposed above grade, use click-type clamp system at all times.

k. Individual Raceways: Support individual raceways with separate pipe hangers or clamps.
l. Grouping of Raceways: Arrange for grouping of parallel horizontal/vertical conduit runs to be supported together at the proper intervals on trapeze type hangers. No tie wire support is acceptable.
m. Threaded Steel Hanger Rods: Use minimum 1/4-inch diameter for support of a single conduit up to a 2" conduit. Single conduits 2" and larger, minimum 5/16" diameter support rod. Rods to be cut and not left with more than 3/8" after support.
n. Weight distribution of vertical conduits: Arrange supports in vertical runs so the weight of raceways and enclosed conductors are carried entirely by raceway supports, with no weight load on raceway terminals.
o. Washers/Fasteners: Provide proper type of washers and fasteners for the type of application. Fender washers are not allowed.
p. Sleeves: Sleeves must be listed. Install for cable and raceway penetrations of concrete slabs and wall unless core drilled holes are used.
    i. Pipe Sleeves: Stainless Steel or ASTM A53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
    ii. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies.
    iii. Install sleeves during erection of concrete and masonry walls.
q. When free wire is installed and goes through a wall, regardless of fire rating, a UL listed sleeve assembly shall be used.
r. Wall-Mounted Electrical Equipment: Install surface and wall-mounted equipment on Unistrut equivalent supports.
    i. Metal Channel Racks: Install for mounting cabinets, panel boards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.
    ii. Masonry walls: Metal channel racks are not required on masonry walls when not more than one (1) wall mounted panelboard or distribution equipment is installed.

26 05 33 | RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

1. The Architect/Engineer to edit the construction specifications to include the following:
    a. The specification must list the various types of conduit systems that are approved for use on the project and the specific raceway applications for which they are to be used. Approved conduit systems are as follows:
        i. Underground installation: Provide rigid non-metallic (PVC) conduit, schedule 40. If conduit is installed under vehicular traffic, provide schedule 80.
        ii. Outdoor installation, above grade: Provide rigid galvanized steel (RGS) conduit.
        iii. Indoor installation, concealed in wall: Provide electric metallic tube (EMT) conduit. EMT should never be concealed in concrete.
        iv. Indoor installation, exposed and dry: Provide electrical metallic tube (EMT) if not subject to damage. Otherwise provide rigid galvanized steel (RGS) conduit.
        v. Indoor installation, exposed and wet: Provide rigid galvanized steel (RGS) conduit.
        vi. MC cabling is not an acceptable conduit system.
    b. No raceways should be installed in floor slab, unless a floor box for isolated furniture is required.
    c. Minimum size of conduit for all power and lighting raceways is ¾".
    d. Minimum size box is 4"x4"x1-1/2" for single gang devices. 3-1/2" deep for furniture whip boxes.

e. The Architect/Engineer shall coordinate the exact trim of the box with the type of wall and weather the box is concealed, flushed or surface mounted. The construction documents shall indicate the typical type of trim based on the wall type for all types of wall mounted devices.
f. Installation:
    i. General: There shall be no single bend exceeding 90 degrees in any conduit run.
    ii. All raceways shall be installed parallel to the structure.
    iii. Single runs of raceways shall not be installed without a pullbox if it contains more than three (3) 90 degree bends. Provide straight pull boxes for every 100 feet of conduit.
    iv. No "shepherd hook" type installations are allowed to make bends or turns.
g. Aluminum: No aluminum raceways, boxes, extensions or mud rings will be permitted.
h. Conduit: Provide rigid steel conduit, in, below, or through concrete floor slabs, vapor barriers, and in masonry or concrete walls. Protect conduit utilizing one of the following methods:
    i. Field-coated with two coats of bitumastic compound
    ii. Additional outside factory coating of polyvinyl chloride, phenolic-resin-epoxy material, or other equally flexible and chemical resistant material
i. All fittings shall be steel or malleable iron without exception, conforming to ANSI C80.4. Where concealed, fittings may be set-screw type with insulated throat connectors having two (2) set screws in line at each tubing connection for sizes 1-1/4 to 2-inches, and two (2) set screws 45 degrees apart at each tubing connection for sizes 2-1/2 to 4inches.
j. Provide steel or malleable iron compression type, UL listed fittings for rain-tight applications, with insulated throat and casehardened locknuts.
k. The connection of power or communications outlets within permanently installed cabinets and casework shall be concealed and run in EMT.
l. The contractor shall coordinate with the College is there is an exception for connections on a specific piece of furniture.
m. Exposed Connections: Provide Liquidtight Flexible Metal Conduit, 24-inch maximum length in mechanical rooms, damp and wet locations, or where flexible connections are required.
n. Flexible Metal Raceways: Shall not be used to extend a raceway system, or for the connection of outlets within permanently installed cabinets or casework. Flexible metal raceways shall be steel (no aluminum will be permitted).
    i. May be used only where they will be concealed or exploded, but dry.
    ii. May be used for the connection of recessed lighting fixtures where a maximum run of 6-feet will be permitted.
    iii. Connections to items requiring frequent maintenance.
    iv. Fittings: Steel or malleable iron, UL listed when used for grounding. No die-cast or pot metal fittings will be permitted.
o. Pull Wire: Provide a pull wire in all empty raceways. Pull wire shall be #14 TW, Thomas Industries Jet Line #232 Polyofin 200 lb. Test, or equivalent.
p. Raceways penetrating walls or floors through sleeves shall be sealed and fire-stopped.
q. Conductors or circuits of differing voltages (i.e., 120/208VAC or 277/480VAC, or Class 1, Class 2, and Class 3 Remote-Control, Signaling, and Power Limited circuits, or circuits originating in different panel boards) shall not be installed or contained in the same conduit run.

r. The use of raceway not specific to the system as an extension of the primary raceway is not allowed (i.e. conduit going through a gutter and then exiting it).
s. Architectural Millwork and Furniture: Provide a trough or enclosure with a screw cover to house or enclose data cables, communications cables and power raceways.

2. Communications Raceway: Communication raceways must meet the installation requirements in NFPA 70. Refer to section 27 05 00 for additional requirements.
   a. Cable Tray:
      i. Provide in continuous runs without gaps, field-fabricated fittings, or bends.
      ii. Only manufactured fittings will be acceptable.
      iii. All cable tray components to be from single manufacturer.
      iv. Installed cable tray shall be easily accessible with a minimum of 2-feet clear on each side.
      v. To be independently supported from building structure with uniform load distribution capable of supporting a uniformly distributed load on the indicated support span when supported as a simple span and tested according to NEMA VE 1.
      vi. Cable trays must be continuously grounded.
      vii. Cabling in cable tray needs to be specified for air-plenum spaces when applicable.
   b. When Cable tray installation is not possible, a zone box system is the preferred raceway system for communications cabling. Provide one (1) zone box for each classroom.
   c. Each communication outlet location requires One (1) - one-inch conduit stub-up to accessible ceiling space. Conduit ends must be protected by nylon bushings.
   d. Each one-inch conduit shall extend from a 4" x 4" x 1-1/2" wall box with a single gang mud ring for the communication outlet located at 18" A.F.F unless otherwise noted.
   e. Must provide One (1) - two-inch fire rated sleeve above accessible ceiling space for cable pathway from classroom and/or office space to cable tray or Telecommunication Room in each room for every three workstation outlets
   f. Any floor box communication outlet location where enclosed conduit is used must be homerun to the nearest wall and stub up to accessible ceiling space.
   g. Any communication outlet located in hard ceiling areas must extend the conduit back to the nearest Telecommunication Room.
3. Surface-Mounted Raceways: Are not allowed unless given approval by the College. If the Architect/Engineer believes that these type of installation would be beneficial to the project, coordinate approval form the College. If approved, provide a fabricated trough or enclosure with a screw cover to house or enclose data cables, communications cables, and power raceways.
      i. Locate to provide easy access for servicing or future expansion or modification of the enclosed systems.
      ii. Provide grommets for power, data and communications cables at proper locations. Size shall be 1-3/4 inches or 2 inches as required.
4. Architectural Millwork and Furniture: The Architect/Engineer shall coordinate the specific requirements for the internal raceway with the manufacture and then provide the specifications of these installations into the contract documents.

1. Panelboards must be constructed to comply with the requirements of UL 67 and UL 50.
2. All panelboard interiors must be constructed using hard-drawn copper of 98 percent conductivity, with AIC bracing greater than the calculated available fault current.
3. Short circuit ratings: The minimum short circuit rating for 208Y/120V panelboards must be 10,000 amperes symmetrical. The minimum short circuit rating for 480Y/277V panelboards must be 14,000 amperes symmetrical.
4. The Architect/Engineer to edit the construction specifications to include the following:
    a. General: Tag all conductors with source information (i.e. fed from) and identify unused conduits in or at outlets, raceways, panels, pull boxes, switch boards, motor controllers, cabinets and similar items. Conductor tags shall be non-conductive or Brady-type markers.
    b. All conductors to be provided with factory color insulation.
    c. Junction Boxes: All lighting and power junction boxes shall be identified by circuit and panel board number and color-coded in a permanent manner.
    d. Other Devices: All disconnect switches, panel boards, motor starters, system controllers, fire alarm zones, transformers, power outlets (other than ordinary receptacles) shall be identified by installing a permanent plastic laminated engraved nameplate with appropriate designation. Any other loads, with its associated controls, and line voltage lighting switches, shall be identified by self-adhesive identification labels.
    e. Panel Board Directories: Typewritten indicating complete as-built circuit information, and protected by a plastic covering.
        i. The contractor shall coordinate the cutting of the panel board directory with the size of the plastic pocket of the panel board.
        ii. The directory shall be white, card stock and not paper.
        iii. Directory shall indicate Panel name, voltage, fed from (source and room number), date installed.
        iv. Contractor information not allowed.
    f. The contractor shall provide a master power riser in the main electrical room.
    g. Re-type directory after additional work is performed in the panel.
    h. Color-Coding: Identify all systems by painting the designated color-code on all junction boxes and covers using the following system:
        i. Normal Power - Black
        ii. Telephone - Gray
        iii. Normal Lighting - Blue
        iv. Sound System - Light Blue
        v. Emergency Light/Power - Orange
        vi. Energy Management - Pink
        vii. Fire Alarm - Red
        viii. ATC/AC Control System - Purple
        ix. Clock System - Green
        x. Computer/Conditioned Power - Yellow
        xi. Data Systems - White
        xii. Security - Burgundy

xiii. MATV Systems - Brow

5. Panel Schedules: The Architect/Engineer shall include all panel schedules on the Drawings and shall include the following:
   a. Load description including location or room number and use indicated for each circuit (as-built documentation shall show corrected information).
   b. Panel power source including room number.
   c. Panel type and capacity, individual load calculations, short circuit, conduit, wire size, grounding, neutrals and overcurrent protection.

26 05 72 | OVERCURRENT PROTECTIVE DEVICES

1. All breakers in the 480 volt-rated service main switchgear must be fully rated.
2. Series rating equipment is not to be permitted.
3. Coordinate Short Circuit Current Calculations: The Architect/Engineer shall coordinate with utility available fault current to determine the proper AIC rating of circuit breakers and electrical distribution gear in accordance with NEC. Submit calculations to the College for review prior to final construction document submittal. Include calculations on the Electrical Drawings.
4. The Architect/Engineer shall provide a specification section into the construction documents for the contractor to include in the bid package an overcurrent protection device coordination, short circuit analysis and arc flash assessment with labeling of all new electrical components. It shall be added to the section that the results need to be submitted to the College and the Engineer of Record for review and approval prior to purchasing of any equipment.
5. For all new circuit breakers requiring GFCI protection, the Engineer shall provide settings that need to be adjusted on the field in the contract documents.
6. Fused disconnects: only to be used when the manufacturer recommends a fused OCPD and when the motors are small enough that a 15 A breaker is too big per NEC OCPD motor table. all fuses from the same brand, type, and match.
7. The Engineer shall include on the contract documents that all new lighting poles shall be provided with fuses.
8. The Engineer shall indicate on the contract documents that all the circuit breakers for the fire alarm equipment shall be of color red and of the lockable type.
9. Surge Protection Device (SPD):
   a. Application: A listed SPD device shall be provided for each building service entrance, distribution panel, sub-panel, and individual equipment including motor control center.
   b. Location: All SPD locations shall be coordinated to be as close as possible to the circuit breaker feeding it. The Engineer shall add on the drawings that the contractor can change the breaker position on the field to make the location of SPD work.

      All new SPDs shall be installed on the sides of panelboards only and with the shortest length of conductors; not on top or bottom.
   c. Purpose: The SPD shall be designed to protect all AC electrical circuits and connected equipment from the destructive, damaging and disruptive effects of lightning induced transients, normal utility load switching activities, and internally generated transients caused by the normal operation of connected equipment, as well as capacitive and inductive load switching that typically accounts for 80 percent of the transient activity at a given facility. Design in accordance with these requirements and those of the SPD manufacturer.

d. Provide SPD for all the outdoor lighting poles, incoming mains, sub-panels, computer circuits, fire alarm systems, and other sensitive equipment or systems.
e. Provide SPD for all the copper conductors going or coming from the exterior regardless of the usage or coverage.
f. The Engineer shall specify that all SPDs for service equipment shall be rated Type I and connected to 60A, 3pole circuit breaker. All other SPDs shall be rated Type II and connected to 30A. 3pole circuit breaker.
g. Only field wired SPDs are allowed. Internal mounted SPDs, pre-wired or furnished with "pig-tail" connections are not allowed.
h. For renovation projects: If an existing panelboard or distribution board is being used for new loads, and it does not contain an SPD, a new SPD must be included in the scope of work for the existing equipment.

10. The Architect/Engineer to edit the construction specifications to include the following:
    a. All circuit breakers for motor equipment shall be rated HACR type.
    b. All overcurrent protection devices shall be new. Re-furbished ad re-used devices are not allowed.
    c. Phase fuses in all fused disconnect switches shall be of the same type, model and manufacturer; no mixes.
    d. All SPD components shall be designed, tested, manufactured, listed and installed in accordance with the applicable publications, resources, and standards.

26 24 16 | PANEL BOARDS

1. Panel Board Schedules shall indicate details of size, capacity, number of poles, and number of circuits. Each branch circuit listed in the schedule shall have an indication of location of usage.
2. Location: Units shall not be located in corridors or public/staff areas except by special written authorization from the College.
3. Selection: Where a major portion of the loads supplied by the panel board are non-linear, a non-linear type panel board shall be used. Use of Load Centers is not acceptable.
4. Fault Current Ratings shall be adequate to carry all available fault current. Refer to section 26 05 72 Overcurrent Protective Devices for more information.
5. Future Expansion: Refer to 26 00 00 Electrical Design and General Requirements for spare capacity requirements. For renovation projects, replace existing panelboards if the new loads added will use the spare capacity left on the existing panelboards. The Engineer shall coordinate with the Owner if the replacement of the panelboard is cost efficient for the scope of work of the project.
6. Installation, General: Panel boards, circuit breaker enclosures, and cabinets shall be mounted not more than 6'-6" above the finish floor as measured to the top of the unit. Install so the center of the switch grip, or circuit breaker operating handle, will not be more than 6 feet above the finish floor when in its highest position.
7. Fused Pullouts are not acceptable and shall not be used for any purpose.
8. The Architect/Engineer to edit the construction specifications to include the following:
    a. Buses: Panel board buses shall be copper or silver-plated copper only.
    b. Dedicated electrical space: The contractor shall not install any foreign material not related to the panelboard in the dedicated electrical space per NEC.
    c. No pre-punched backboxes panelboards.
    d. Shield the interior of the enclosure when drilling into the panelboard to prevent foreign materials to penetrate the enclosures.

e. The contractor shall coordinate the entry feed of the panelboard feeder prior to insulations. No side feed routing to get to the proper feed location is allowed.
f. Inside space shall be coordinated so that all internal terminations are accessible. Usage of cable ties to make space management are required. Cables should not be touching any portion of supports of the panelboard parts.
g. Replaced screws that hold the bracket of the dead front should be from the panelboard manufacturer. Coordinate that no cross threaded screw are used, otherwise the interiors of the panelboard will be required to be replaced. Use manufacturer approved screws.
h. Provide factory labels to identify the poles. No field printed labels are allowed.
i. Use door on door cover whether the panelboard is flushed or surface mounted.
j. No modifications to the existing front covers are allowed.
k. Provide phase rotation labeling at all main distribution equipment.
l. A full-size copper ground bus for connecting ground conductors must be bonded to the steel cabinet.
m. Branch circuit breakers must be bolt-on designed for replacement without disturbing the adjacent units. Breakers must comply with the requirements of UL 489, thermal magnetic type with a short-circuit rating greater than the calculated available fault current.
n. Panels must be specified with "door-in-door" trim.

26 24 24 | MOTOR CONTROLS

1. General: Provide combination across-the-line controller with the required motor circuit disconnect switch included, HOA switch, phase monitoring on all three phase starters for protection against phase loss or phase reversal, electronic overload protection, and no pilot light.
2. All control devices with electronics (i.e. VFD, Starters) shall be installed indoor and accessible.
3. The Engineer shall coordinate with the motor equipment manufacturer, with integral control unit with disconnect capabilities, the applicable Code requirements in regards to mounting height and current ratings.
4. The Engineer shall coordinate all required raceway for low voltage control cabling and include it on the construction documents.
5. Provide 120V, 20A, 1phase branch circuit, with disconnect, for all building management control panels.
6. The Engineer shall coordinate that, where required, all external control interface devices for fire alarm and motor controls should be installed in a separate enclosure (outside of the starters) to comply with space, voltage and insulation requirements.
7. The Architect/Engineer to edit the construction specifications to include the following:
   a. VFD Line-side Mitigation: Provide equipment such as Harmonic Traps for equipment utilizing 6 pulse and 12 pulse power supplies, all variable frequency drives, and appliances capable of generating harmonic frequency currents or voltages on their respective circuits of significant magnitude that would be harmful to the facility's electrical system.

1. Sequencing: All surface-mounted wiring devices and assemblies shall be installed only after finish painting is completed.
2. The Architect/Engineer to edit the construction specifications to include the following:
   a. Metal boxes, extensions or mud rings made from aluminum are not acceptable.
   b. Minimum size box is 4"x4"x1-1/2" for single devices. 3-1/2" deep for furniture whip boxes.
   c. "Handy" Boxes, 180 boxes, or gangable/non-gangable 2-inch wide ("cut-in") switch boxes will not be permitted.
   d. Box Height: Minimum receptacle box mounting height shall be 18 inches and switch height 46 inches on center. All finish device height shall be uniform within wall run. No operable switch to be installed above 48 inches.
   e. All devices to be back-wired.
   f. Receptacles: Specification grade, Simplex or Duplex receptacles shall be 2-pole, 3-wire rated at 125 volts and 20 amps, equipped with green hexagonal equipment grounding screw, ground terminals and poles internally connected to the mounting yoke, with plated ears, back wiring, NEMA configuration 5-20R.
   g. Plates: Non-standard size plates are not allowed. Nylon plates are not acceptable.
   h. Tamper resistant receptacles are only allowed on day-care or health-related facilities. Engineer to specify this on the contract documents if it applies, otherwise, specify that tamper-resistant receptacles are not acceptable.
   i. GFI: Ground fault interrupter, specification grade duplex receptacles shall be of the GFCI (ground fault circuit interrupter) grounding type, UL rated Class A, Group 1, 20-amp rating, 120 volts, 60 Hz, with solid-state ground fault sensing and signaling with 5-milliamperes ground fault trip level, NEMA 5-20.
   j. Toggle Switches: Provide single pole or multi-pole heavy-duty, back wired, flush toggle, 20-amp, 120/277 volts AC, commercial grade.
   k. Interior Finish Plates: Provide smooth, standard white, thermoset, standard size plates. No oversized plates. The Architect/Engineer to coordinate with the College if an unusual installation would benefit from a different color plate.
   l. Installation of Boxes:
      i. Where used to enclose flush devices, provide with the proper mud ring to ensure that the front-edge to finish, and side edge to plaster complies with NEC. The use of "goof rings" is unacceptable.
      ii. Boxes to be fully mudded in.
      iii. Boxes of any type shall not be supported from ceiling support wires. All boxes shall be supported from building structure independently.
      iv. Do not install back-to-back; install at least 12-inches apart
   m. Installation of Receptacles: Vertical installation shall be with the ground pin down. Horizontal installation shall be with the neutral pin-up.
3. The Architect/Engineer shall coordinate the trim of the boxes with the type of wall and whether is concealed, flushed or surfaced. Drawings would indicate the typical type of trim based on the wall type for all types of wall mounted devices.
4. When a GFI receptacle is required by code for a dedicated equipment not considered movable, the receptacle to be installed behind the equipment and provide ground fault protection module with reset button next to the equipment (at 48" AFF) that is readily accessible as required by Code.
5. GFI receptacles next to sink shall not be mounted closer than 12" from the rim of the sink.
6. The Architect/Engineer shall provide weatherproof GFCI receptacles for all outdoor installations and all indoor wet or damp rated locations.

7. The Architect/Engineer shall provide GFI receptacles inside all electrical, mechanical and custodial rooms.
8. The Architect/Engineer shall provide GFI corrosion resistant receptacles for all science labs with water and gas utilities.
9. GFI receptacles installed to protect downstream non-gfi receptacles, in the same branch circuit, is not acceptable.
10. The Architect/Engineer shall provide safety disconnects for all hard-wired connections.

26 36 00 | TRANSFORMERS

1. K-Rated Transformers: Specify power conditioning equipment or devices, or other disturbance mitigation methods for systems supplying outlets for computer terminal or other sensitive equipment.
2. Installation:
   a. Preferably, all transformers shall be floor mounted secured to a 4-inch high concrete housekeeping pad. All pads need to be shown on the floor plans and on specifications.
   b. Transformers larger than 30KVA can be mounted on a floor rack if space is limited. The Architect/Engineer shall coordinate this installation with the College and get approval.
   c. Transformers rated at 30 KVA or less may be mounted on the wall.
   d. For any transformers hung from, or mounted to, overhead building structure, a structural engineer calculation of weight needs to be submitted to the College for approval and added to the construction documents.
   e. For any of the above type of supports, engineer to include details with materials and construction instructions to the construction documents.
3. The Architect/Engineer to edit the construction specifications to include the following:
   a. Provide units with copper windings and electrostatic shielding. Aluminum windings are not allowed.
   b. Dry-Type Transformers: Provide "Energy Star", low impedance units with copper windings, amorphous iron or silicon steel core and type "HN insulation, 115 degrees C temperature rise above 40 degrees C ambient.
   c. Transformer isolation pads (not to be confused with the housekeeping pad) are not allowed.
   d. Location of the transformer pad bolts need to be coordinated and mocked on the pad prior to setting the transformer down and should never be drilled at an angle. Proper washers need to be used.
   e. All the screws and parts that have to do with the supports for the mounting of the transformer need to be new and supplied by transformer manufacturer. Random spare parts are not allowed.
   f. All new transformers to shall be provided with internal ground bus bar supplied from manufacturer factory.
4. Clearances: Engineer to make sure that all code required and manufacturer recommended clearances are met. Provide nothing less than 6" or manufacturer recommendations (whichever is largest) on the rear of the equipment. Leave space on the side for conduit installation.
5. Provide primary, non-fused, disconnect on all transformers with label on transformer showing the location of the primary OCPD. When space is limited, coordinate with the College to get waiver for this standard.

26 40 00 | LIGHTNING PROTECTION

1. General: The College's facilities are located in a geographical area that experiences the highest incidence of lightning strikes in the Nation. Therefore, all new facilities shall have a certified lightning protection system included in the design.
2. All new Lightning Protection Systems (LPS) shall be of Early Streamer Emission (ESE) Lightning Protection: Basis of design shall be Lightning Preventer System as distributed by Omega Power Systems, Inc or approved equal.
3. Lightning protection must be provided in accordance with NFPA 780. The system must be carefully designed to ensure that static discharges are provided with an adequate path to ground. Surge arrestors on the main electrical service must be provided. Systems served at utilization voltages 208Y/120V or 480Y/277V must be provided with two levels of protection for sensitive electronic loads.
4. For renovation projects:
    a. If the project's scope of work consists of re-roofing work and the building contains an existing lightning protection system, replace the existing LPS with new.
    b. If the project's scope of work consists of renovating interiors of a building where there is no scope of work on the roof, and without lightning protection, a new LPS shall be installed if project consist of renovating 80% or more of the interior spaces.
    c. If the project's scope of work consists of the installation of new roof mounted equipment on an existing roof with lighting protection, provide new connection to the existing system for new roof equipment. Otherwise, no LPS is required.
5. The Engineer shall provide local LPS for all new parking lot poles.
6. All new chiller yards in separate structures shall have LPS.
7. All LPS shall be bonded to the existing building grounding electrode system with a conductor of not smaller than #3/0.
8. Surge Suppression: Include a complete network of surge suppression from the service to sensitive equipment outlets.

26 51 00 | LIGHTING SYSTEMS

1. General: Lighting illumination values shall be in accordance with Florida Department of Education, Office of Educational Facilities, State Requirements for Educational Facilities (latest edition) and IEEE Standards. Basis of design for all fixtures shall be LED.
    a. If there is an area that is not covered on the FBC for foot-candle levels, use recommended levels shown on IESNA.
2. Illumination Certification: Provide computer-generated calculations prepared by the lighting fixture manufacturer or engineering of record certifying that lighting levels in foot candles and equivalent spherical illumination values comply with specified standards. Include calculations on drawings for normal conditions and emergency conditions.
3. Provide power density calculations to comply with FBC energy code.
4. Luminaires must be appropriately selected based upon the expected application. Luminaires must have a minimum luminaire efficiency of 65 percent.
    a. LED lamps must not be retrofitted into existing luminaires unless the retrofitted product meets all of the following requirements:
        i. UL rating is maintained for ENTIRE fixture to include UL 1598C and UL 1993.
        ii. Retrofitted lamps must be tested by a recognized Testing Laboratory in accordance with IES standards LM-79, LM-80, and TM-21
        iii. Minimum TOTAL fixture efficacy of 100 lumens per watt (total efficacy is a combination of lamp plus driver

plus ballast)
   iv. Product MUST BE dimmable and compatible with existing lighting control systems and future daylighting technologies
   v. LED products must have a "low risk" level of flicker (light modulation) of less than 5%, especially below 90Hz operation to prevent photosensitivity-epileptic seizures as defined by IEEE standard 1789-2015LED
   vi. For common office areas, LED product MUST be dimmable and compatible with existing lighting control systems and provide a path to compatibility with future daylighting technologies, or reduced power consumption by at least 50% for non-controlled fixtures mechanical, and corridors, LED products do not have to be dimmable but compatible with existing lighting control systems and reduce power consumption by at least 50%.
   vii. Space photometrics and glare control must meet IES guidelines for tasks performed in the retrofitted spaces.
   viii. A mock up retrofit of typical areas of the building is required to confirm the above performance requirements of lighting output suitability controllability and flicker measurements
   ix. Minimize lamps, light sources and driver types.

5. Lamps: Effort must be made to minimize the number of lamp types within a facility to simplify lamp maintenance.
   a. In retrofit scenarios, all fluorescent lamps must be recycled by firms that recover the mercury that is contained within the lamps. All PCB-containing ballasts must be disposed of through specialized disposal firms that destroy the PCBs. All applicable lamps must be FEMP compliant and/or Energy Star certified as applicable.
6. Mounting: For all general usage areas (classrooms, office, conference, low ceiling lobby, restrooms, etc.) fixtures shall not be mounted above 10'. For all other unique areas that require a higher ceiling (auditoriums, lecture halls, theaters, gyms, cafeterias, library, atriums) fixtures to be mounted on the walls or on the ceiling if there is space to get to a higher altitude with special mechanism to get access (lifts, scaffolding).
   a. Stairwell lighting to be mounted on the side wall if ceiling is higher than 8'.
   b. Lighting location should never be mounted above fixed furniture where is impossible to get access above to maintain them.
7. Architectural Lighting and indirect lighting fixtures shall not be used or specified without written authorization from the College.
8. Lighting Controls: Control systems must be compatible with lamps, light sources, drivers and switches.
   a. Lighting controls must be commissioned to operate as intended without false triggering.
   b. All lighting controls must be compatible with luminaires.
   c. Lighting control devices provided for illumination within exit enclosures must comply with the requirements in NFPA 101.
   d. To comply with FBC energy code and ASHRAE 90.1 for automatic shutoffs, local controls, automatic on dimming, mid-level lighting and daylight harvesting.
   e. For all new buildings, or new floors, provide a new networked digital lighting control system as basis of design. Coordinate with the College if a more cost efficient and code compliant system benefit the project.
   f. For renovations where more than 50% of the floor or building is renovated, provide new networked digital lighting control system type controls for area being renovated. For anything lower than that percentage, provide low voltage local controls to comply with energy code.
   g. All occupancy/vacancy sensors to be dual-tech and dual output for HVAC controls.
   h. Instructional Spaces: Provide control system for classrooms, laboratories, and rooms used for instructional pur-

poses, that will result in optimum light levels for the application of digital projection teaching systems.

i. Lighting control stations shall be located at each exit and at the front of the room at the instructor's station.
ii. Provide a 4-zone switch to match to all instructional spaces switch.
    1. Zone 1: All ON/Off
    2. Zone 2: All 50% Dim
    3. Zone 3: Projection Zone ON/OFF
    4. Zone 4: Rest of lights ON/OFF
iii. All of these spaces shall be set up for vacancy mode (manual on-auto off) with low-voltage momentary switch.
iv. All sensors to be specified with dual output for HVAC controls

i. Indoor Common Areas: Restrooms, corridors, lobbies, stairs provide controls as follows:
    i. For new spaces:
        1. When building is occupied, lights to be at a low foot-candle level in a non-occupied mode and bring to full bright when occupied or override with occupancy sensor.
        2. When building is not occupied, all lights in these areas are be off. Use EMS output for building occupancy schedule.
    ii. If renovated with local low voltage controls, these areas should be controlled following:
        1. Every other fixture to be controlled by the EMS occupancy schedule and the rest on an occupancy sensor. Provide override switch for EMS controlled fixtures. This override is an input from the EMS system.
    iii. Provide switches at every point of entrance of these areas.
j. Outdoor Building Mounted Fixtures:
    i. If new, all fixtures to be specified with integral sensors. Minimum 2 zones shall be provided (one with the entrance doors and every other, and the other zone with all the rest).
        1. During occupied time and at night, all fixtures to be on at full bright.
        2. During non-occupied time and at night, the zone with entrance door lights shall be at 50% dimmed and override to full bright with sensor. The other zone is off.
        3. During day time, all off.
        4. Use EMS output to control the building occupancy schedule.
k. Parking lot lights and pedestrian walk: Provide addressable lighting controls where the head-end equipment shall be located at the building where the light fixtures are being fed from. Provide astronomical time schedule controls.

9. The Architect/Engineer to edit the construction specifications to include the following:
    a. Contractor to provide normal and emergency point-by-point foot candle specific area plots for all functional areas (including site lighting, exterior lighting, and lighting for non-instructional areas) as part of shop drawing submittal if an approved substitution is in place or if the engineer of record performed the lighting calculation in house.
    b. Maintenance: Lighting fixtures shall be so designed that there shall be no special equipment, tools, or methods needed for a worker to reach the fixture for the purpose of maintaining it, or to replace lamps
    c. Follow manufacturer instructions for installations. No splices to happen inside of fixtures. Provide box if fixture does not come with splice box.
    d. Recessed Fixtures: May be connected with flexible raceways not exceeding 6-feet in length made to a junction box in accessible concealed spaces above ceilings. No fixture to fixture connections will be permitted except

where the fixtures are mounted end-to-end and mechanically connected together.

e. No daisy chained fixtures. A common centralized raceway system with required boxes shall be installed and flex conduits shall only be permitted for dedicated fixture connection.
f. Independently Support each lay-in fixture from the building structure, diagonally from two comers with minimum #12 AWG steel wire located at each of the 4 corners.
g. Fixture Support Bars spanning structural T-bar ceiling channels shall be required for surface-mounted fixtures. Support bars and fittings shall allow vertical and horizontal positioning of the fixture.
h. "Y" Grid Ceilings: Proper ceiling grid hangers shall be used for mounting or suspending light fixtures. The grid hanger shall be secured to the main support channels of the ceiling Lighting and have provisions for locking in place and acceptance of stem canopy fixtures or surface mounted fixtures.
i. Industrial Lighting: Provide 2' or 4' LED vapor tight fixtures in areas such as mechanic room, electrical rooms, and elevator machine room and elevator pit.
j. Provide permanent -non-movable support for light fixtures mounted for open hangers where wind is a concern.
k. Provide all fixtures with a dedicated in filed installed disconnect.

26 52 00 | EMERGENCY LIGHTING

1. Emergency lighting must be provided in accordance with the requirements of NFPA 101 and FBC Section 453 for Educational Facilities.
   a. At a minimum, unswitched emergency lighting must be provided in the following areas:
      i. Where required in NFPA 101
      ii. Instructional spaces
      iii. Open Offices
      iv. Conference Rooms
      v. Restrooms
      vi. Corridors
      vii. Assembly Spaces
      viii. Gym
      ix. Health-related Exam rooms
      x. UPS and battery rooms
      xi. Electrical /Mechanical rooms
      xii. Outdoor pedestrian walkways
      xiii. Entrances and exits doors of buildings
2. Emergency lighting must be able to be manually switched from within area with the normal lighting control:
3. Supplemental battery-powered emergency lighting must be provided in the following spaces to bridge the generator startup time:
   a. Generator rooms
   b. Main mechanical and electrical rooms
   c. Any locations where lighting cannot be interrupted for any length of time
4. Exit Signs: Exit signs must meet the requirements in NFPA 101 and be energy efficient and environmentally friendly products (e.g., light emitting diodes (LED type), photoluminescent type. Tritium exit signs must not be installed.

a. Provide red LED having the salient features described below. If existing green letter exit signs are installed, new exit signs shall match the existing.
   i. Precision die-cast aluminum or white plastic construction throughout all indoor wet area. Provide White plastic construction weather proof rated for anything outdoor.
   ii. Normal AC illumination shall be provided by digital design red LED lamp panels consuming 7 watts or less per face at 120 or 277 VAC
   iii. "Edge lite" type exit signs are not allowed. Lighting for the letters are to be by internal ac backlite panels.
   iv. Standard snap-out directional arrows.
   v. Comply with all UL 924 requirements.
   vi. Provide white plastic mounting canopies for end, ceiling, and wall mounted models.
   vii. Dimensions shall be approximately 7-3/4 inches high by 10-1/2 inches wide by 2-1/4 inches deep.
   viii. Transformers shall be provided for universal 120/277 VAC Lighting. New exit signs shall be specified for Universal (120/277) volts.
b. When an EPS is not installed, emergency power shall be achieved through a factory-installed, fully automatic, power pack providing 1-1/2 hours of emergency operation, otherwise, provide emergency power from the EPS. Power pack components shall mount inside the fixture casing and include a solid-state battery charger, a maintenance-free nickel-cadmium battery, a charge indicator pilot light, and a test switch. The charger shall be capable of recharging the battery within acceptable UL specified time standards.
c. Splices for exit signs shall always be installed outside of the fixture to prevent blockage of the lighting of the letters.
d. Pendant mount outdoor exit sings are not allowed. All outdoor exit sings to be directly mounted on structure.

5. All public occupied spaces that required emergency lighting, a minimum of 2 fixtures shall be provided to illuminate the path of egress.
6. Renovations: When a networked digital lighting control system is in place, all new EM fixtures to be provided with UL924 capabilities integral to the fixture. When networked digital lighting control system is not installed, an external UL924 relay shall be provided to control all new EM fixtures.
7. Lighting fixtures with integral battery drivers are not allowed.

26 52 19 | EMERGENCY POWER SYSTEMS

1. Purpose: Emergency and standby power systems must be designed to comply with the requirements of the FBC, NFPA 110, and NFPA 111. Compliance with the electrical safety of the installation, operation, and maintenance of emergency systems is required, as addressed in Article 700 of NFPA 70.
2. Unless otherwise specifically authorized by the College, all facilities must be provided with an authorized Emergency Power Supply Systems (EPSS) to supply power to the facility in the event of a sudden loss of power.
3. The class and type of Emergency Power Supply Systems (EPSS) must be a minimum of Level 1, Class 2, Type 10. 2 is the minimum time in hours for which the EPSS is designed to operate at its rated load without being refueled and 10 is the maximum time in seconds that the EPSS will permit the load terminals of the transfer switch to be less than 90 percent of the rated voltage.
4. Emergency Power Source (EPS): Sealed, maintenance-free batteries with expected 10-year life and a 10-year pro-rata warranty.
5. An EPS must supply equipment classified as emergency through an automatic transfer switch upon failure of the

normal supply. Emergency loads (life safety loads) must include:
   a. Emergency lighting
   b. Fire alarm system
   c. Exit signs
   d. Automatic fire detection equipment for smokeproof enclosures
   e. Emergency voice/alarm communication systems
   f. Smoke control systems
   g. Exit stairway pressurization systems
   h. Fire pump
   i. Pressure maintenance (jockey) pump
   j. Air compressors serving dry pipe or pre-action systems
   k. Power and lighting for fire command center and security control center
   l. Fire service access elevators and associated controllers and the cooling and ventilation equipment serving their machinery rooms and machinery spaces (simultaneously all designated elevators).
   m. Occupant evacuation elevators and associated controllers and the cooling and ventilation equipment serving their machinery rooms and machinery spaces (simultaneously all designated elevators).
6. This system must automatically supply power to selected loads (other than those classified as the emergency system) upon failure of the normal source. The transfer time limit must not exceed 60 seconds. Required standby loads must include:
   a. Visitor screening equipment
   b. Telephone switches and fiber cable battery systems
   c. Security systems
   d. Mechanical control systems
   e. BASs
   f. Sump pumps
   g. Sewage ejection pumps
   h. Uninterruptible power systems serving technology/server rooms
   i. HVAC systems for technology/server rooms, UPS rooms, and communications rooms
   j. Exhaust fan in UPS battery rooms
   k. Aircraft obstruction lights
7. Emergency diesel generator power system shall be used for emergency and stand by loads exceeding 24 KVA or consider inverter alternate for less than 24 KVA. When generators are not provided, an external generator dock connection will be required.
8. Where the standby generator supplies a switchboard, power may be distributed from the switchboard to the emergency, legally required standby, and optional standby systems, in accordance with Figure B.1 (a) and B.1 (b), NFPA 110.
9. Generators: The emergency generator system must consist of one or more central engine generators and a separate distribution system with automatic transfer switches, distribution panels, lighting panels, and, where required, dry-type transformers feeding 208Y/120V panels. The electrical engineer must coordinate with the mechanical engineer and architect on the design of the generator system.
   a. Natural gas generators are not allowed.

b. Outdoor: If installed outdoors, they must be provided with rated outdoor enclosure with hurricane wind level withstanding rating.
c. Operation of starting batteries and battery chargers must also be considered in sizing calculations.
d. In humid locations heaters can reduce moisture collection in the generator windings.
e. Critical silencers are required for all generators.
f. Acoustical treatment of the generator room must be provided as necessary.
g. Temperature and ventilation must be maintained within the manufacturers' recommendations to ensure proper operation of the unit. Calculations to support the size of the intake air supply for combustion, cooling, and radiation, as well as exhaust piping and exhaust paths, must be provided by the mechanical engineer.
h. Radiators must be unit mounted if possible. If ventilation is restricted in indoor applications, remote installation is acceptable. Heat recovery and load shedding must not be considered. The remote location of radiators must be designed to avoid excess pressure on the piping seals.
i. A permanently installed load bank, sized at a minimum of 50 percent of generator rating, must be provided. The load bank may be factory mounted to the radiator. Care should be taken in selecting materials that will tolerate the high temperatures associated with radiator-mounted load banks to include belts, flex connections, motors, sprinkler heads, and so on loads when operating at 50 percent of generator KW name plate. The load bank shall have a minimum of four automatic load taps controlled by a load add/shed relay incorporated into the run circuit on the generator.
j. Capacity: The engine generators must be sized to serve approximately 150 percent of the design load and to run at a maximum of 60 percent to 80 percent of their rated capacities after the effect of the inrush current declines. When sizing the generators, the initial voltage drop on generator output due to starting currents of loads must not exceed 15 percent.
k. Day tanks must be sized for a minimum capacity of four hours of generator operation. Provide direct fuel oil supply and fuel oil return piping to the on-site storage tank. Piping must not be connected into the boiler transfer fuel oil delivery "loop." Care must be exercised in sizing fuel oil storage tanks by taking into account that the bottom 10 percent of the tank is unusable and that the tank is normally not full (normally at a 70 percent level) before the operation of the generator.
l. Generator alarms must be provided on the exterior wall of the generator room. All malfunctions must be transmitted to the BAS. In all buildings, with or without BAS, a generator alarm annunciator must be located within the fire annunciator panel. The generator output breaker must have a contact connected to the BAS indicating output breaker position, to allow annunciation of the open position on the BAS.
m. Voltage Output regulation shall be +/- 0.5% of nominal
n. Generator Windings: 2/3 pitch design to eliminate triplen harmonics on the voltage waveform and for the mitigation of excessive neutral currents when supplying non-linear loads

10. Automatic Transfer Switches: Automatic transfer switches serving motor loads must have in-phase monitors (to ensure transfer only when normal and emergency voltages are in phase) to prevent possible motor damage caused by an out-of-phase transfer. They must also have pretransfer contacts to signal time delay returns in the emergency motor control centers.
    a. Automatic transfer switches must include a bypass isolation switch that allows manual bypass of the normal or emergency source to ensure continued power to emergency circuits in the event of a switch failure or required maintenance.

11. Location: The generators and the generator control panel must be located in separate rooms or enclosures.
12. Life Safety and Emergency Egress Lighting: Provide systems listed by Underwriters' Laboratories (UL) under UL 924. Specify additional battery pack lighting in electrical and generator rooms.
13. Emergency AC Inverter System: Storage battery type for emergency loads from 2500 VA to 24 kVA, consisting of a 3-stage battery charger, a DC to AC static inverter with transfer relay circuit, a battery bank properly sized for load requirement, a solid state custom IC-controlled electronics system, and a central display panel. Other salient features are as follows:
    a. Electronics and Batteries: Provide fully enclosed in 16 gage, welded steel cabinetry of modular design that allows side-by-side or vertical stacking. When provided stackable, cabinets must be capable of being stacked two high for each two unit stack and shall have a foot print no larger than 27-inches wide by 18-1/2 inches, and a maximum height of 92-inches when stacked.
    b. Battery Charger 3-stage unit meeting UL 924 standards and having the following features:
        i. IC-controlled for continuous monitoring and full charge maintenance
        ii. Temperature compensated, constant voltage type providing constant current, float, and equalization of charging modes
        iii. Operating efficiency not less than 85%, with each mode of operation indicated by a 2-color LED on the unit's central display panel
    c. Output circuit fuse and thermal cutout on the charger transformer to insure fail-safe operation
    d. AC Inverter System shall deliver single phase, sinusoidal emergency power free from high voltage surges or frequency drift and shall have the following features:
        i. Inverter Start-up: Capable of transferring 100% of the system's rated capacity to the connected emergency load within one second of utility failure
        ii. Output: Sinusoidal AC wave form with voltage regulation held to +10%, -5% variance from nominal (standard input/output voltages shall be 120/120 or 277/277 VAC, 60 Hz, single phase)
        iii. Output Frequency Tolerance: 60 Hz+/-2%
        iv. Total Harmonic Distortion: Less than 10%
        v. Inverter shall accommodate load power factors of 0.5 lead to 0.5 lag
        vi. Operating Efficiency: Not less than 85%
14. Central Display Panel: Located on the front of the electronics cabinet having the following features:
    a. Service Alert Alarm section shall provide audio/visual alarms for the following:
        i. HI/LO Battery
        ii. OUTPUT CIRCUIT BREAKER OPEN
        iii. BATTERY CAPACITY/TRANSFER CIRCUIT
        iv. THERMAL OVERLOAD
        v. ALARM SILENCE
15. Test Switch to initiate a 5-minute discharge/diagnostic cycle check of emergency operation
16. Systems Status Panel to provide the following:
    a. STATUS INDICATOR (to indicate charger operation)
    b. UNIT READY (indicates unit is ready for emergency operation)
    c. AC OUTPUT VOLTS: DC CHARGER CURRENT; DC INPUT VOLTS; AND OUTPUT FREQUENCY are to be indicated on a 3-figure LED digital display

17. Output Distribution Circuit Breakers: Provide an appropriate number in electronics cabinet
    a. 2-Year System Warranty
    b. Factory Start-Up
    c. Automatic Transfer Switch:
        i. Must be UL-1008 listed through 480 VAC.
18. Automatic Transfer Switch Drive Mechanism: Shall not be dependent upon springs, gravity, latches or counterweights, and shall be operated by a positive, unidirectional stroke, fully electrically energized drive mechanism that will prevent an accidental neutral position and assure contact transfer in 6-cycles or less.
19. Emergency Lighting: Provide each emergency fixture with battery backup ballast.

27 00 00 | COMMUNICATIONS

1. The Structured Cabling design is based on an Ethernet network star topology layout for the Local Area Network (LAN) in which all nodes are individually connected to a central connection point in a point-to point architectural design utilizing a combination of Unshielded Twisted Pair (UTP) copper cable and multi/ single mode fiber optic cable. This standard is drawn from the ANSI/TIA/EIA Structured Wiring Standard which supports the goals of the District Technology Plan. All designs and installation must comply with all BICSI, EIA/TIA Standards and NEC Code. Projects will vary depending on whether the project is new or retrofit design and construction.

27 05 00 | COMMON WORK RESULTS FOR COMMUNICATIONS

1. Provide a complete structured cabling system (racks, outlets, patch panels, patch cords, wire management, media/cabling, testing, administration, commissioning, etc.).
2. Telecommunication Room (TR): Provide a minimum of one (1) TR per floor, additional TRs are required when the cable channel distribution distance from user communication outlet location to TR exceeds 295 feet. Multiple story buildings will have a minimum of one (1) TR per floor.
    a. The size of the TR will vary depending on the number of racks required for the area being served. The TR shall be a minimum of 8 feet x 10 feet when housing 1 – 2 rack(s), 10 feet x 12 feet when housing 3 racks.
    b. Locate TR within the building to ensure that the horizontal cable runs to the workstation outlets are properly installed and do not exceed 295 feet.
    c. The TR is to contain only equipment related to data, voice, and video services. Other equipment allowed to be in the room are division 28 head-end equipment.
    d. The total space allocation for each communications rack with vertical wire management is 24 inches wide x 84 inches high. Multiple communications racks may be used and the quantity and placement will be located during design. There must be 4 feet of clear working space from the back of rack placement to wall and a minimum of 3 feet of clear working space from the front of rack placement to the entry wall of the TR room.
    e. New TR Design Requirements:
        i. Not to serve as storage or janitorial rooms. Electrical and mechanical rooms/areas are not to be used as TR(s).
        ii. Security should be provided for the TR through the use of locking hardware and/or door contacts. Refer to Division 28.
        iii. VCT anti-static flooring must be used and carpet is not acceptable.
        iv. The cabling termination wall shall be covered with 4' x 8 'x 3/4" fire rated plywood backboard(s) installed on end 4 inches A.F.F. (above fixed floor). The backboard(s) are to be painted to match interior wall color.
        v. There shall be no roof penetrations or water pipes located above the TR.
        vi. 3 feet wide x 6 feet 8 inches high entry door (minimum) is required for the TR. Doors should be metal with lockable hardware and meet ADA requirements and open to outside.
        vii. Lighting in the room should be located so that the communications rack(s) working space (front and back vicinity) is clearly illuminated. Provide at least one normal lighting branch circuit and one emergency lighting branch circuit at each TR.
        viii. No windows, louvers, or access panels are to be in the TR.
        ix. The TR shall be equipped with one (1) double duplex 20A-125V outlet receptacle (NEMA 5-20R) mounted on each rack at 18" AFF with each outlet on its own dedicated circuit. Provide at least (1) duplex 20A-125V

This section includes:

outlet receptacle (NEMA 5-20R) mounted on the backboard at each wall of the room. Provide dedicated circuit for with not more that (2) of these convenience receptacles.

x. The HVAC system shall be designed to ensure that the room ambient temperature shall be maintained 24 hours / 7 days (24 x 7) between 55 F and 78 F. Relative humidity shall not exceed 40 percent. Any required cooling shall accommodate an internal 50-watt minimum per square foot heat load generated within the TR. Provide a thermostat for each room.

xi. Drop Ceilings shall be installed in all TR(s) and at a minimum finished ceiling are required. A 9'0" or higher ceiling is desirable.

xii. All entry cable pathways into the TR shall be properly fire stopped allowing for future addition and subtraction of cables to be made without removal of the existing system. If 4" conduit is used, then an approved UL system must be used.

xiii. Provide 18" ladder rack around the TR and above the racks for cabling distribution.

xiv. Grounding: See Section 26 05 26 Grounding. All cable trays and conduit sleeves must be properly grounded.

f. Renovation projects: The engineer shall visit the site to assess the conditions and the capacity of the existing TR. Provide additional rack mounted equipment as required for new connections. New equipment to match existing. Coordinate with BCPM if more space is required for new equipment.

3. Distribution Pathway/Raceway System: Where suspended ceilings are available, the design of the horizontal distribution cable pathway from the TR to workstations shall be by a cable tray to support the main length of the cables. A conduit system is the preferred method for the protection of the cabling infrastructure if cable tray or j-hooks cannot be installed. This is required for use in at grade or below grade level concrete slabs and for inter-building distribution pathways. All communications cable and wiring conduits installed between the TRs must be metal conduit with the appropriate pull points and make accommodations for the distribution of fiber optic cabling such as minimum bend radius sweeps with a minimum number of bends in compliance with BICSI Standards. The cable tray, if required, shall be for the sole use of the Division 27 and Division 28 cabling. All pathways must be clear and enclosed conduit must have pull string. All inside and outside conduits and raceways must be installed per BICSI, EIA/TIA 569 Standards and NEC codes.

a. Cable Tray: Provide cable tray as manufactured by Wiremaid, CM-20, Pro-10 Cable Manager. Sized tray accordingly to fit in above the ceiling space and be capable of supporting the amount of cabling fro the space with additional 40% spare space.

i. The cable tray is used to distribute horizontal cabling from each room conduit sleeve penetration to the TR. Install all necessary manufacturer sweeps to maintain proper bend radius.

ii. Provide cable tray extension to land on TR perimeter ladder rack below the ceiling grid.

b. Conduit / Raceways: Refer to 26 05 33 Raceways and Boxes for Electrical Systems for requirements. All conduit and raceway shall be painted black.

c. Telecommunication room ladder rack/cable runway: Provide ladder rack as manufactured by Chatsworth Products, Universal Cable Runway model with its required support brackets.

d. Floor mounted racks: Provide cable management racks as manufactured by Legrand, Ortronics, 16.25 channel depth, Mighty Mo 6 Series, 7 feet tall, with RoHS certification.

i. Rack Base Insulator: Chatsworth Product, 10605 series.

ii. End Panel: Legrand, Ortronics, Mighty Mo 6 Series

iii. Single Sided Shelf: Chatsworth Products, 40074-X00.

iv. Vertical Cable Management Cage with Door: Legrand, Ortronics, Mighty Mo 6, 6"x8"x7' and 10"x13"x7'.
v. Cable Management Panel: Legrand, Ortronics, Mighty Mo 6, Organizers, OR-MM6HMF2RU, OR-MM6HMF1RU

4. Communication Outlets: Designated locations for communication outlets should accommodate room rearrangements and future alternate uses whenever possible. All raceway and boxes must be recessed unless otherwise approved by BCPM.

27 11 00 | COMMUNICATIONS EQUIPMENT ROOM LABELING

1. Labeling shall comply with TIA/EIA-606-A and UL 969.

27 13 00 | COMMUNICATIONS BACKBONE CABLING

1. Engineer to meet with BCPM to discuss the requirements of the project regarding existing and new systems.
2. Materials shall be:
   a. Cable Supports: Support brackets, lacing bars, spools, J-hooks, and D-rings.
   b. Conduit and boxes. Flexible metal conduit is allowed when wall is fished.
   c. Optical Fiber Cabling:
      i. Multimode: Optical Cable Corporation, DX012DALT9QR
      ii. Single mode: Optical Cable Corporation, DX012DSLX9KR
   d. Rack Mount 1U: Legrand, Ortronics, OR-FC01U-C.
   e. Single Mode Adapters: Legrand, Ortronics, OR-OFP-SCD12AC.
   f. Multimode Adapters: Legrand, Ortronics, OR-OFP-SCD12LC.
   g. Blank Panels: Legrand, Ortronics, OR-OFP-Blank
3. Connectors: Simplex and duplex, Type SC connectors.

27 15 00 | COMMUNICATIONS HORIZONTAL CABLING

1. Engineer to meet with BCPM to discuss the requirements of the project regarding existing and new systems.
2. Materials shall be:
   a. Data Cabling: Mohawk, 4 pair, #23 AWG, UTP Cat6e + Plenum, HT41192, M57196.
   b. Data Outlets Jacks: Legrand, Ortronics, Clarity 6 Trackjack, t568A/B, 180 degree, Fog White, OR-TJ600.
   c. Data Outlet Faceplates: Legrand, Ortronics, Trackack, Coordinate amount of ports, Single Gang, Fog White, OR-40300545.
   d. Data Blank Modules: Legrand, Ortronics, Tracjack, Fog White, OR-42100002.
   e. Wall Phone Cabling: Mohawk, Multipair, 25pair, #24 AWG UTP Cat 5e + plenum, LT48094, M58141
   f. Wall Phone Faceplate: Legrand, Ortronics, Tracjack, stainless steel, single gang, one port, OR-403STJ1WP

28 00 00 | ELECTRONIC SAFETY AND SECURITY

1. Renovation projects: The Architect/Engineer shall meet with BCPM and discuss the conditions of Access Control, Video Surveillance and Fire Alarm systems and how the new project affects the existing system. The maintenance report findings shall be also discussed during this meeting to decide how to fix or take care of any of the deficiencies.

28 10 00 | ELECTRONIC ACCESS CONTROL AND INTRUSION DETECTION

1. Refer to Appendix 28 01 for the Access Control Communication Matrix.
2. Access Control/Security System panel:
   a. For new buildings, the engineer shall provide one access control/security system panel located in the new telecommunications room. Location of the panel shall be coordinated not to overlap with the working clearance of the telecommunication equipment inside the room.
   b. For renovation projects, the engineer shall replace the existing panel if the panel does not meet with the current BC design standards. Coordinate with BCPM to discuss the conditions of the existing access control/security system panel and clarify if a replacement is required as part of the scope of work of the project.
   c. There shall be one panel per every sixteen doors with access control. A double door shall be counted as two doors.
   d. When adding or replacing a panel, and the existing security system was already connected to a main campus location, the fire alarm system shall be adjusted to provide new supervisory relay connections. The main campus connection shall be re-isntalled.
3. The engineer shall provide one 20A, 120V, 1phase dedicated branch circuit and one telecommunication connection for each access control/security system panel. The engineer shall coordinate with BCPM if power shall be connected to the building emergency power system or if panel will be provided with battery backup.
4. Access Control: The Architect/Engineer shall meet with BCPM during the space design process to identify points of entrance/exit that require to be connected to the building access control system or have any type of door hardware.
   a. For all new doors that require access control, hardwired connections shall be provided to be connected to the access control system. The architect/engineer shall coordinate and provide at each of these doors the following, but not limited to.
      i. Electronic strike
      ii. Card readers
      iii. Door contact
      iv. Panic Hardware (for exterior egress doors; Engineer to coordinate with Architect location)
         1. Provide one 20A, 120V, 1phase branch circuit.
         2. Provide 120V to 24/12V DC power supply above the ceiling.
         3. Coordinate separation of class A low voltage cabling and 120V wires in power supplies.
      v. Motion detection
      vi. Push to exit button
   b. The engineer shall provide one ¾" conduit stub up the ceiling for all of the above devices. Low voltage cabling shall be installed in wall through raceway and cable tray back to panel location. If cable tray is not available, provide J-hook or conduit (3/4" minimum) back to telecommunications room. Refer to 26 05 33 Raceways and Boxes for Electrical Systems section for more information.
      i. For renovations and to avoid big wall cuts and re-paint, engineer to discuss with BCPM approval of install-

ing in wall flex conduit not more than 4" long.
   c. Cabling for all of the devices shall be plenum rated cable.
   d. If door does not allow the installation of the devices mentioned above, the architect/engineer shall provide a networked hardwired lock as manufactured by Schlage by Allegion, AD-300 model, or approved equal.
   e. For renovation projects, the architect/engineer to discuss with BCPM the options of wireless card readers (Schlage by Allegion, AD-400 model or approved equal) as an alternate to the hardwired connections. This installation can be used as an option when construction is limited (i.e. door proximity to panel) or as a VE item.
5. ADA door operators: The architect and engineer shall coordinate location of card reader next to door operator push button.
   a. For new projects, when ADA door operator is required and at same door with card reader, door operator to be activated from card reader.
6. The engineer shall request from BCPM the most recent list of vendors for access control and include them in the respective specification section.

28 20 00 | VIDEO SURVEILLANCE

1. Video Surveillance Network Video Recorder (NVR):
   a. For new buildings, the engineer shall locate the new NVRs on the telecommunications data rack (rack mounted).
   b. For renovation projects, the engineer shall meet with BCPM to discuss the conditions of the existing NVRs and clarify if a replacement is required as part of the scope of work of the project
   c. There shall be one NVR unit per every 30 cameras.
   d. All new NVRs shall be provided with backup batteries/power supplies.
   e. The Engineer shall provide power to NVRs from rack mounted POE switch connection. Engineer to assess the capacity of POE connections in the room and also is switches have backup power supplies. Engineer shall provide new switches and backup power supplies if neither are available.
2. Cameras:
   a. All cameras shall be connected to the system with a Cat6 plenum rated cable.
   b. Provide 4-11/16 inch x 4-11/16 inch x 2 1/8 inch mounting boxes with covers and T-bar at designated interior locations. If the area location has removable ceiling tile, the box shall be located above the tile. If the location has a structure of fixed ceiling material, then flush mount the box with a double gang mud ring & cover.
   c. Provide 4-11/16 inch x 4-11/16 inch x 2-1/8 inch flush mounted mounting boxes with double gang mud ring and weatherproof covers; mounted with the opening vertical, at all designated exterior locations fed from additional 4-22/26 inch x 4-11/16 inch x 2-1/8 inch boxes at the interior feed penetrations through the exterior walls.
   d. All camera cabling to be installed with telecommunications cable tray, if available. Provide J-hooks or conduit (1" conduit minimum) back to NVR location if cable tray is not available.
3. The Engineer shall provide a camera at each of the following locations, but not limited to.
   a. Entrance door of the building (one looking from outside and one looking from the inside.)
   b. Telecommunications room entrance (from outside).
   c. Computer Lab classroom (from outside).
   d. Technology Lab classroom (from outside).
   e. Working/Testing Lab classroom (from outside).

f. Any other special room with special equipment.
g. Coordinate with BCPM for any other special room that would require cameras.

4. Emergency Blue Phones:
   a. The Engineer shall provide one 20A, 120V, 1phase branch circuit to each blue phone location. Provide voltage drop calculations.

28 30 00 | FIRE ALARM

1. Fire alarm and emergency communication systems must be installed in accordance with the requirements in NFPA 72, the FBC, the Florida Prevention Code, the NEC and the appropriate College fire alarm system specification.
2. Special Requirements: The following requirements take precedence over the requirements in NFPA 72 and the FBC:
   a. For new buildings: All fire alarm systems installed in buildings must be an emergency communication system when any one of the following conditions exists:
      i. The building is two or more stories in height above the level of exit discharge.
      ii. The total calculated occupant load of the building is 300 or more occupants.
      iii. The building is subject to 100 or more occupants above or below the level of exit discharge.
      iv. The emergency communication system must provide an automatic voice message in response to the receipt of a signal indicative of a fire emergency. Manual control with the capability of making live voice announcements must also be furnished to provide occupants notification on either a selective or all-call basis.
      v. With the exception of mass notification, a fire alarm and emergency communication system are not permitted to be integrated with other building systems such as building automation, energy management, security, and so on. Fire alarm and emergency communication systems must be self-contained, standalone systems able to function independently of other building systems.
      vi. All fire alarm signals (i.e., alarm, supervisory, and trouble signals) must be automatically transmitted to a supervising station evaluated by Underwriters Laboratories (UL) to UL Standard 827, Central Station Alarm Services (UUFX Category Code). The communication methods used to transmit signals to the supervising station shall meet the requirements in NFPA 72. Two different communication paths are required to be provided.
         1. The engineer shall coordinate with BCPM how to achieve the connection to a supervising station for each project. The intent is that all building shall communicate to BC Central Campus.
      vii. Operation of a duct smoke detector must initiate a supervisory signal and a control module shout activate the shutdown of the AHU.
      viii. All fire alarm wiring shall be solid copper and installed in conduit. Stranded wiring must not be used.
      ix. Conduit must be rigid metal or electrical metallic tubing, with a minimum inside diameter of 19 mm (3/4 inch) that utilizes compression or set screw type fittings and couplings.
      x. Each fire alarm system shall be provided with a power conditioner to protect the fire alarm system from electrical surges, spikes, over-voltages, and electrical noise. The Power conditioner shall be U.L. listed and shall have built in overload protection.
      xi. All new emergency generators must be monitored by the fire alarm system for the following supervisory conditions: Generator Running, Generator Common Trouble. In addition, the generator controllers must include the NFPA 110 required generator monitoring and output contacts.
   b. For renovation projects: If existing system is of a horn type system the engineer shall consult the following with

BCPM for the upgrade/replacement of the existing system.

i. If more than 50% of the whole building is being renovated, the existing system needs to be replaced with new.
ii. If less than 50% of the whole building is being renovated but more than 30%, the existing panel shall be replaced with so that it can handle new voice evacuation devices and existing horn system devices.
iii. If less than 30% of the whole building is being renovated, the new devices hall be specified to be able to function with the existing system.
iv. The engineer shall incorporate into the drawings all needed construction phasing notes to indicate if a parallel system needs to be installed (or any Fire Watch requirements) if building shutdown time is limited.
    1. If parallel system needs to be incorporated, location of new notification devices shall be installed as ceiling mounted when a drop ceiling is available to avoid wall cutting and patching.
v. The engineer shall specify that all new devices in existing system to be installed by same manufacturer as the existing device to maintain system testing and listing. The engineer shall coordinate with BCPM if testing agency contract of the existing system is expired or still active.

3. Manual Fire Alarm Boxes: Manual fire alarm boxes must be installed in accordance with the requirements in NFPA 72 and the FBC.
    a. Special Requirements: The following requirement takes precedence over the requirements in NFPA 72 and the FBC:
        i. Manual fire alarm boxes must be installed in all new fire alarm system projects in accordance with the spacing and location requirements in NFPA 72.
        ii. Pull station height shall be 48" above finish floor to the top of the box.
        iii. Outdoor pull stations to be provided with covers.
4. The engineer shall include the following as a minimum for each project that includes upgrades to the fire alarm system or any new fire alarm system.
    a. Matrix indicating the pashing of actions for each device activation.
    b. Complete riser diagram with room numbers and quantity of devices.
5. System Description: Microprocessor controlled, intelligent reporting fire alarm system.
    a. Manufacturer: Notifier Fire Systems.
6. System Performance: Fire alarm system shall be UL, FM and ISO9001 listed and provide the following:
    a. Alarm, Trouble and Supervisory Signals: Provide from all intelligent reporting devices encoded on NFPA Style 4 (Class B) Signaling Line Circuits (SLC)
    b. Initiation Device Circuits (IDC): Provide as Class B wired circuits (NFPA Style B) as part of an addressable device connected to the SLC.
    c. Notification Appliance Circuits (NAC): Provide as Class B wired circuits (NFPA Style Y) as part of an addressable device connected by the SLC or a panel circuit
    d. Alarm Signals: Signals arriving at the main fire alarm control panel (FACP) shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded
7. System Functional Operation: When a fire alarm condition is detected and reported by one of the system's initiating devices, the following functions shall immediately occur:
    a. System alarm LED on the FACP will flash
    b. Local piezo electric signal in the control panel will sound
    c. Display on the FACP will indicate all information associated with the fire alarm condition, including the type of

alarm point and its location
   d. All system output programs assigned via control-by-event interlock programming to be activated by the particular point in alarm will be executed and the associated system outputs will be activated
8. System Capacity and General Operation:
   a. Capable of expansion where required for future additions
   b. Include Form-C alarm and trouble relays rated at a minimum of 3.0 amps at 30 VDC
   c. Fire alarm control panel shall include a full-featured operator interface and back-lit 80 character LCD
   d. Fully field programmable
9. Specific System Operations:
   a. Point Disable
   b. Point Read
   c. System Status Reports
   d. Water Flow Operation
   e. Supervisory Operation
   f. Signal Silence Operation
10. Warranty: Provide warranty for a 3-year period from date of acceptance by the College. Warranty shall cover defects of any kind and shall include all labor and materials. Notifier distributor must meet NESCO requirements for the warranty.
11. Installation Contractor shall be a Notifier distributor, a member of NESCO (Notifier Engineered Systems Company), and shall have NICET Level II certification, and a State of Florida Fire License. Installing technicians shall have Alarm Agent Certification or higher.
12. Wiring: Color-coded and identified with Brady tags or other suitable means of identification to provide ease of tracing for maintenance, trouble identification and correction purposes.
   a. Color-coding shall be reflected on the required Record (As-Built) Drawings. Refer to Section 01 70 00 Close Out Requirements, for additional requirements.
   b. Loop - Twisted Pair - Red outer sheath
   c. Notification Appliances - Orange & Yellow (out); Purple & Violet (in)
   d. Door Holder - Pink & White
   e. AHU Shut Down - Blue & Gray
   f. 24 Volt DC - Red & Black; Note: All wire shall be stranded
   g. If FPL cable is used, color code shall be uniform throughout the system
   h. Conduit: Minimum 3/4-inch conduit
13. Fire Alarm Control Panel (FACP): Completely microprocessor-based, analog, and addressable. The FACP software, not the detector, shall make the alarm/normal decision, thereby allowing the sensitivity of each detector to be set in the FACP program. Basic operator controls shall include the following:
   a. Acknowledge Switch
   b. Alarm Silence Switch
   c. System Reset Switch
   d. Lamp Test
14. Central Microprocessor High-speed, state-of-the-art, able to communicate with, monitor and control all external interfaces; include an EPROM for system program storage, nonvolatile memory for building-specific program stor-

age, a "watch dog" timer circuit to detect and report microprocessor failure, and ability to perform the following functions:
   a. Real-time Clock: To provide for time annotation of system displays, printer, and history file; time of day and date shall not be lost if system primary and secondary power fail.
   b. Control-by-Event Programs: Capable of containing and executing programs for specific action to be taken is alarm condition is detected by the system
15. Display: 80-character (minimum) back-lit LCD capable of providing light-emitting-diodes (LED's) for standard fire alarm indications; provide with a type keypad and multiple password levels
16. Signaling Line Circuits (SLC): Provide a minimum of one SLC that can provide power to, and communicate with, intelligent detectors (ionization, photoelectric, or thermal) and intelligent modules (monitor or control)
17. Power Supply: Modular expandable with over-current protection on all power circuits, an integral battery charger for 24 hours of standby using dual-rate charging techniques, and all circuits power-limited UL 864 requirements including ground fault detection.
18. Addressable Devices: Detectors shall be intelligent (analog) and addressable, and shall connect with two wires to the fire alarm control panel signaling line circuits. Detectors shall be ceiling-mounted types with separate twist-lock base with tamper-proof feature. Functions include the following:
19. Smoke and Thermal Detectors to provide alarm and power/polling LED's
20. FACP to permit detector sensitivity adjustment through field programming
21. Testing whereby detectors will simulate an alarm condition and report that condition to the FACP
22. Batteries: In addition to generator power circuit, provide system with Gel Cell type, 12-volt nominal (two required) with the capacity to power the fire alarm system for not less than 24 hours, plus 5-minutes of alarm upon a normal AC power failure.
23. Remote Annunciator Panel: All fire alarm systems must have at least one annunciator located in plain view within 7.6 m (25 ft.) of the primary fire department entrance to the building.
   a. Function: Upon activation of any alarm device, the annunciator will identify the exact location of the device.
   b. Features: Provide one additional silence key switch as well as the following standard features:
      i. Built-in voltage regulator
      ii. Reverse polarity protection
      iii. Per point diode isolation
      iv. Lamp test key switch
   c. For renovation projects: Replace existing annunciator panel of new space layout is part of the project. New annunciator panel shall be digital and not map/floor plan type.
   d. All new annunciator panels to have floor plan next to it indicating location of main fire alarm panel and rout to it from annunciator panel location.
24. Wiring: Install wire in conduit or raceway.
25. Multiple Cables: Where three or more cables are contained within a single conduit, the filled cross-sectional area of the conduit shall not exceed 40 percent
26. Cable Separation: Cable shall be separated from any open conductors of power or Class 1 circuits, and shall not be placed in any conduit, junction box, or raceway containing these conditions per NEC.
27. Fire Alarm Control Panel: Connect to a dedicated branch circuit, maximum 20 amps. Circuit breaker to be of red color and lockable type (no coloring is allowed)

28. Signaling Line Circuits (SLC): Wire all SLC loops per NFPA 72, Style 4 (Class B)
29. System Testing: All testing shall be done in accordance with NFPA 72.
30. Waterflow switch(es) must be installed in accordance with the requirements in NFPA 13, NFPA 72, and the FBC.
    a. Special Requirements: The following requirements take precedence over the requirements in NFPA 13, NFPA 72, and the FBC:
        i. Waterflow switch(es) must be installed on each floor or fire area protected by sprinkler systems.
        ii. Each waterflow switch must be separately annunciated at the main fire alarm control unit and all required annunciators.
31. Smoke detectors must be installed in accordance with the requirements in NFPA 72 and the FBC.
    a. Special Requirements: The following requirements take precedence over the requirements in NFPA 72 and the FBC:
        i. Area smoke detectors must not be installed in any of the following rooms: mechanical equipment rooms, electrical closets, telephone closets, and emergency generator rooms.
        ii. Smoke detectors specifically for the protection of the fire control unit(s), notification appliance circuit power extenders, and supervising station transmitting equipment must not be installed in a building protected throughout by an automatic sprinkler system.
        iii. Smoke detection appropriate for the application must be installed in each of the following: uninterruptible power service rooms, electrical switch gear rooms, transformer vaults, telephone exchanges, and information technology equipment as specified in this chapter. When smoke detection is installed in rooms having high voltage equipment, the smoke detection must not be installed directly above the high voltage equipment.
        iv. Duct smoke detectors must meet the requirements in NFPA 90A.
        v. Duct smoke detectors shall be provided with remote test switch and remote led indicator outside of the mechanical room. Test switch shall be located so that it can be accessible with a ladder.
32. Audible Notification Appliances: Performance, location, and mounting of audible notification appliances must be in accordance with the requirements in NFPA 72.
    a. Special Requirements: The following requirements take precedence over the requirements in NFPA 72:
        i. The design for achieving the required minimum dBA levels must take into consideration all building construction materials such as carpeting, hard surfaces, walls, doors, etc., and any other materials that can cause sound level attenuation and/or clarity problems in the placement and location of all audible notification appliances.
        ii. Remote dedicated amplification
        iii. Remote signal modules
    b. The Engineer shall add to the contract documents that the contractor shall add to the bid an allowance for twenty extra audible devices for any additional devices required by final Fire Marshall walkthrough for system intelligibility.
33. Visible Notification Appliances: Placement and spacing of visible notification appliances must be in accordance with the requirements in NFPA 72.
    a. Special Requirements: The following requirements take precedence over the requirements in NFPA 72:
        i. Unless the project includes a new fire alarm system or a complete replacement of an existing fire alarm system, visible notification appliances are not required to be installed in areas where visible notification appliances do not currently exist or where noncompliant existing visible notification appliances currently exist. This requirement does not preclude the addition of new visible notification appliances to existing fire alarm

systems that contain existing compliant visible notification appliances.
   ii. Visible notification appliances must be installed only in public and common areas. For the purposes of this requirement, visible notification appliances are not required to be installed in individual offices. Public and common areas include public rest rooms, reception areas, building core areas, conference rooms, open office areas, and so on.
   iii. Visible notification appliances are not permitted to be installed in exit enclosures (e.g., exit stairs).
b. The Engineer shall add to the contract documents that all new visible appliances shall be synced together with existing devices prior to completion of project.

34. Occupant Notification: Transmission of an alarm signal from any fire alarm system initiation device to notify the occupants throughout the building must be in accordance with the requirements in NFPA 72 and the FBC.
    a. Special Requirements: The following requirement takes precedence over the requirements in NFPA 72 and the FBC:
       i. All alarm signals transmitted from any fire alarm system initiation device must activate the respective building audible and visible notification appliances to notify the occupants.
       ii. Duct smoke detectors must not activate the fire alarm system notification appliances.
35. Laboratory Gas Tanks: Engineer to coordinate that the main gas tank of the building has fire alarm control module for the valve.
36. Elevator Recall: Devices and connections to the fire alarm system shall be added to the system for the purpose of recalling the elevator, or elevators to a specific landing and removed from normal service because of activation of firefighters' service, either automatically or manually in accordance with the requirements in NFPA 72, ASME A17 and the FBC.
    a. For renovations projects, the engineer shall walk the site and get familiar with the existing conditions prior to any issuance of construction documents. All required primary/secondary relays, shunt trip relays shall be provided.
37. For overhead door that require to be released upon fire alarm activation:
    a. Provide control relay for release of overhead door upon activation of two smoke detectors (one at each side of overhead door). A delay of 15 seconds shall be applied to allow people to move away.
    b. Provide amber visual notification device to flash as a warning that the door will be closed in the next 15 second. This device shall be installed with a message next to it with the message of the intent of the delay.

29-30

DIVISIONS 29-30
RESERVED FOR FUTURE EXPANSION

NOT USED

BROWARD COLLEGE®

31 22 00 | GRADING

1. Grates:
   a. All storm water outfalls shall have protection grates and horizontal energy dissipation pads per FDOT specifications.
   b. Provide Florida Accessibility Code for Building Construction compliant grates at all trench drains and inlets at areas of pedestrian traffic.
2. Site Drainage Grading:
   a. The construction drawings shall clearly show (and have appropriate spot elevations) of finish grades in the areas of structures/buildings and shall be designed to shed surface runoff away from the structures/buildings. The A/E shall ensure that the finish floor elevations shall be a minimum of 8" above adjacent finish site grades to ensure positive runoff away from the structures/buildings. No water shall be designed to sheet flow over sidewalks from landscape areas or roofs.
   b. Renovation projects shall be designed to make modifications to spaces and adjacent grades such that the above criteria are met. Swales and runoff collection systems shall be designed and clearly shown on the construction documents to ensure drainage away from all buildings.
   c. Design for storm drainage away from buildings, parking areas and driveways. Consider flow of concentrated storm drainage, design to slow down velocity. Concentrated drainage across sidewalks shall not be allowed, nor will ponding be allowed. Discharge from roofs and canopies shall be directed away from buildings and walks or tied to an underground storm drainage system.
   d. Take roof rain leaders to underground systems (when appropriate) utilizing a sleeve.
   e. Install storm drainage collection devices with a positive outfall in all areas where water can be trapped, especially in closed basin such as between buildings, interior courtyards and other similar conditions.
   f. All storm drainage pipe installed shall comply with the applicable water management agencies, material and construction specifications.
   g. As built drawings, signed and sealed by a Florida registered surveyor, will be required upon completion of the retention basins and storm drainage system. Drawings shall include all invert and grate elevations of all storm pipe and structures.

31 31 16 | TERMITE PROTECTION

1. The general contractor will schedule a meeting, at the site, with the owner, architect and pest control operator to discuss procedures, chemicals and ratios of mix.
2. Termiticide treatments shall not be applied at existing facilities during occupied hours.
3. Termite protection chemicals shall be brought to the site in sealed containers and mixed on site with the Owner present.
4. All applications are to be witnessed by the Owner. 24-hour notice shall be given to the Owner of scheduled treatments. Prior to application, the contractor will be responsible for calculating the square footage, lineal footage and any other dimensions needed to determine the proper ratios of mix being applied.

32 10 00 | PAVING

1. Type FDOT S-1 asphalt shall be specified in all vehicular traffic areas. Consider the use of recycled asphalt whenever possible.
2. Other types of paving and Decorative paving may be considered based on review and approval by BCPM.

32 18 00 | ATHLETIC FIELDS

1. Baseball/Softball fields:
   a. Baseball/Softball fields shall have a sand/clay ratio of 20/80 to 30/70 with surface additive.
   b. Provide a hose bib nearby for maintenance of clay.
   c. Hose bib installed in both dugouts.
   d. Dugouts shall consist of aluminum canopy, chain link fencing and aluminum bench on concrete pad.
2. Provide drinking water fountains at athletic fields.
3. Athletic courts shall be asphalt.
4. Provide basketball goals on courts.
5. All exterior athletic courts shall have flexible base material specified.
6. Soil cement shall not be specified as a base material for any exterior athletic courts.
7. Courts fencing shall be vinyl, black or green-coated galvanized fabric.
8. Soccer fields and Tennis courts shall run north/south.
9. Tennis courts surfacing shall be Plexi-Pave or equal over asphalt.

32 31 00 | FENCES AND GATES

1. Vinyl Coated Chain Link Fence:
   a. Chain link fence shall be minimum 9GA galvanized fabric thickness at all locations.
   b. All posts shall be set in concrete bases.
   c. Tension wire in lieu of bottom rail shall be specified for all locations.
   d. Top and bottom selvage shall be knuckled/turned into the fabric.
   e. Provide minimum one gate 60 inches wide all locations for lawn mower.
   f. Galvanize fabric prior to weaving.
   g. The fence shall be black in color.
   h. Other fence types may be considered based on review and approval by BCPM.

32 33 00 | SITE FURNISHINGS

1. Hardscape drawings shall clearly identify locations and quantities of specified site furnishings. Drawings shall indicate requirements through drawing layouts, details, and material schedules.
2. Contractor to provide samples for each exposed product and for each color, texture and finish specified prior to ordering the selected furnishings.
3. A product schedule for site furnishings shall be provided by the Design Professional. The schedule shall use the same catalog designations provided by the manufacturer, specify all ordering components, finishes and colors.
4. All site furnishing drawing details are to show proper anchoring methods to hardscape elements in order to deter theft or movement. Acceptable methods include:
   a. Direct burial

b. Surface Mount
5. Site furnishing maintenance manuals shall be provided after installation work is complete.

32 33 13 | SITE BICYCLE RACKS

1. Design Professional shall reference basis of design product by Barco Product (www.barcoproducts.com) or approved equal.
   a. Style: Serpentine rack formed from a continuous round pipe.
   b. Material: Galvanized steel tubing, powder coated.
   c. Capacity: 7.
   d. Mounting: Surface mount to concrete slab.

32 33 23 | TRASH AND LITTER RECEPTORS

1. College to provide trash and litter receptors.

32 33 43 | SITE SEATING AND TABLES

1. Site seating and table styles shall meet the following design standards:
   a. Benches must have backs.
   b. Seat and Table combinations: Provide seating for 6 including a handicap accessible space; provide umbrellas.
   c. Tables shall be installed on hard surfaces (concrete, pavers, asphalt) not on grass.
   d. Solar tables are preferred.
   e. Materials: Aluminum or high-density type wood preferred.
2. The Design Professional shall provide Broward College with product cut sheets specifying material, design and overall layout of selected site furnishings for approval. Product cut sheets shall match catalog information provided on layout drawings as designated by Design Professional. Provide products by one of the following acceptable manufacturers:
   a. Anova Site Furnishings (www.anovafurnishings.com), or
   b. Belson Outdoors (www.belson.com).
   c. Landscape Forms (www.landscapeforms.com).
   d. Magnuson Group (www.magnusongroup.com).
   e. Norwood Commercial Furniture (Picnic Tables) Greenspace Series (www.schooloutfitters.com).

32 39 00 | BOLLARDS AND WHEEL STOPS

1. The Design Professional shall provide Broward College with product cut sheets specifying material, design and overall layout of bollard furnishings and parking lot wheel stops for approval.
   a. Wheel Stops: Concrete is the standard.
   b. Bollards:
      i. Provide round dome top, concrete filled, or galvanized steel with plastic sleeve (white or yellow) as required. Bollards shall be FDOT compliant when used in traffic applications.
      ii. Decorative bollards shall be stainless steel with reflective yellow ring. They can be permanent or removable, as reviewed and approved by BCPM.

32 80 00 | IRRIGATION

1. All PVC utilities and main irrigation lines shall have #10 GA copper tracer wire located directly above the line and terminate on a metal device accessible from the surface without excavation. In addition, plastic marker tape indicating the type of line shall be located no less than 2' directly above the utility line. The tape and wire/terminations shall be inspected by the Owner prior to backfill. On main irrigation lines provide marking tape ½ ways between pipe and grade.
2. Irrigation systems shall be designed by the A/E and clearly detailed on the construction drawings. Irrigation systems designed by the installer shall not be allowed. Use Rainbird, Hunter or equivalent unless approved by the Owner.
3. Schedule 40 PVC pipe shall be specified for irrigation lines. All irrigation heads shall be pop-up type, regardless of application. Fixed head, stationary risers shall not be specified.
4. New Irrigation lines connected to re-use water lines shall be "purple" pipe PVC.
5. Existing irrigation lines connected to re-use water lines shall have purple sprinkler heads/caps.
6. All irrigation wells shall have as a basis of bid, 100 FT in depth.
7. Pump and controls design shall be selected for ease of maintenance.
8. Sprinkler systems shall be directed away from buildings and shall not spray on buildings to reduce the likelihood of moisture intrusion.
9. Architect / Engineer to submit a preliminary plan to be reviewed by the owner.
10. Existing systems should be evaluated and field inspected prior to new work being specified.
11. A pre-construction meeting should be scheduled including contractor, Architect/Engineer and owner.
12. At substantial an owner training session will be required.
13. An inspection of the system at the end of the warranty period should be performed.
14. Wipe clean all glue joints of excess adhesive.
15. The pipe edge should be tapered on PVC 2" and larger.
16. At substantial, demonstrate a control wire integrity test, assuring the minimum ohm requirements are satisfied.

32 90 00 | LANDSCAPE

1. Landscape Architect to provide plant schedule with mature height specifications with color photos for each type of planting at mature height. Spacing of planting material shall be based on matured / maintained height and spread.
2. All landscaping shall have root ball wraps cut back prior to planting.
3. A/E's are encouraged to consider sodding throughout entire site. Use proper sod to match soil conditions.
4. All spaces between newly placed sod shall be filled in with organic material, rolled and fertilized as deemed necessary.
5. When sodding next to pavement or sidewalk, always set/lay the top of the sod 1-inch maximum lower than the pavement finish grade. This will prevent sod from trapping water on the pavement or sidewalks. When tying into existing sodded areas, the top of sod elevation shall match existing sodded areas without wedge cut areas.
6. Sod the bottom and side slopes of a retention basin or swale to reduce erosion.
7. The Designer shall indicate the protection of all existing planting to remain or to be relocated.
8. All species should be native to or acclimated to South Florida and require low maintenance. When available to meet landscaping goals, select native plants whose mature sizes are appropriate to the locations planted. Warranty trees and shrubs through indicated maintenance period, and until final acceptance.
9. Warranty trees and shrubs for a period of one year after date of final acceptance against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or

unusual phenomena or incidents which are beyond Landscape Installer's control.

10. Sodded areas should be easily accessible for mowing.
11. Whenever possible incorporate the removal of existing exotic species listed as category I or II by the FLEPPC.
12. Where feasible, reduce lawn areas by increasing xeriscaping with native plants and native ground covers.
13. Utilize integrated pest management to minimize the use of pesticides including insecticides, herbicides, and fungicides.
14. Fertilize sparingly using organic compost or low phosphate/phosphate-free fertilizer.
15. Maintain a grass-free area around trees to avoid damage by weed eaters.
16. Specify Melaleuca mulch when available and avoid mulches containing arsenic or dyes.
17. When designing the landscape plan for the project, review each Master Plan to assure it is consistent with native plant landscaping.
18. Design landscaping to enhance security. Plants of appropriate maintained or mature size will be selected to assure visibility and prevent obstruction of lighting and signage.
19. Maintain plant material away from equipment to meet equipment access requirements.
20. Design for matured tree canopies away from the building roof overhangs.
21. Avoid specifying material that will require hedge pruning.
22. Locate trees and plant material fully clear of parking spaces at parking lot islands.
23. Consider mature size tree roots at hardscape locations.
24. Consider the WANE Tree Preservation System where tree roots will conflict with hardscape; www.wanetreesystems.com.

PROCUREMENT SERVICES
Cypress Creek Center
Phone 954-201-7455
Fax 954-201-7330
www.broward.edu/community/vendor/

PURCHASING BID LIMITS

The Purchasing Department shall convert the purchase requisition to a Purchase Order by following the competitive pricing procedures approved by the District Board of Trustees:

- Broward College Procurement Policy/Procedure Requirements, A6Hx2-6.34
- Florida Department of Education, Rules of Community Colleges, Rule 6A-14.0734 and Florida Statutes 287.017

State Approved Purchasing Dollar Thresholds

Purchases Up to $10,000.00	$0.00 to $10,000: There are no formal or informal competitive requirements for goods and services acquired by the College at this dollar threshold. The requesting department shall obtain one quote identifying the best value for the required commodity or service. A statement of work (SOW) must be provided if services are requested. Small Disadvantage Business (SDB) vendors listed on the College's vendor database should be contacted, if practicable.
$10,000.01 to $35,000.00	$10,000.01 up to Category Two (currently $35,000) as defined in section 287.017(2), Florida Statutes. The requesting department shall obtain three (3) quotes providing the best value for the required commodity or service. However, a statement of work (SOW) must be provided if services are requested. At least three (3) available vendors should be contacted, of which at least two (2) should be SDB vendors listed on the College's vendor database, if practicable. The award shall go to the lowest priced responsive/responsible vendor who meets the requirements. In those rare instances when the required number of vendors is not available and/or it is in the best interests of the College, the requestor, or a procurement representative must document the situation on the Three Quote Form.
$35,000.01 to $65,000.00	Category Two (currently $35,000) up to Category Three (currently $65,000) as defined in section 287.017(2)(3), Florida Statutes. **The Procurement Department shall process a Request to Quote (RTQ)** with detailed specifications of what is required (provided by the requesting department). SDB vendors, if practicable, as listed on the College's vendor database, shall be contacted. The award shall go to the lowest priced responsible/responsive vendor who meets the requirements of the specifications. If two or fewer responses are received, the Procurement Services manager, or his/her designee, may contact one or more non-responding vendors to obtain a backup quote. In those rare instances when the required number of vendors is not available, and/or it is in the best interests of the College, the requestor, or a procurement representative, must document the situation in the RTQ file.

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$65,000.00 or Greater	Exceeding Category Three (currently $65,000) as defined in section 287.017(3), Florida Statutes. The College must release a formal competitive solicitation for goods or services. The College must advertise that it is seeking goods or services, and allow the public at large to compete for award of a contract. Formal solicitations also afford the public with "bid protest rights" as provided by chapter 120, Florida Statutes. The following are different methods of formal competition: a. Invitation To Bid (ITB) is a competitive solicitation requesting pricing on commodities or services based on clearly definable specifications established in the solicitation. An ITB is strictly price driven. It is an advertised formal solicitation for sealed competitive bids, with a specific place, date, and time for public opening of the bids. The award goes to the lowest, responsive and responsible bidder. Pursuant to College Procedure A6Hx2-6.36, the College may establish price preferences on ITBs where most recent annually calculated College utilization data shows underutilization of SDBs in a particular industry category. A price preference of ten percent (10%) of the lowest bid will be utilized for evaluation purposes only. b. Request for Proposals (RFP) is an advertised solicitation for competitive sealed proposals, with a designated place, date and time for opening. An RFP is used when it is not feasible to specifically define the scope of work for contractual services. Instead the College seeks a responsible vendor to present an approach, methodology, price and qualifications for accomplishing the work. All of the qualifications are evaluated by a selection committee. Evaluation criteria and points will be allotted for each factor based on the information in the solicitation. Final terms and price are subject to negotiation by authorized College representatives. An RFP is generally known as "best value procurement" because the award decision is based on a combination of price and non-price factors. c. Request for Qualifications (RFQ) is a process which may be used to determine the qualifications from proposers when the College cannot or has not completely established the scope of services. An RFQ may be used, for example, when creating a pool of qualified vendors to be used on a rotational basis, or in a two-step competitive basis where the scope of services is incomplete and only those firms selected in the qualification phase compete when a project is identified. An RFQ can also be used to establish minimum qualification standards by type of work for consultants, the consultant competitive selection process, and the work performance evaluation system for professional consultants who seek provide professional services to the College pursuant to section 287.055, Florida Statutes, including, but not limited to: acquisition of professional architectural, engineering, landscape architectural, or surveying and mapping services, when a project is identified.

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	d. Invitation to Negotiate (ITN) as defined by section 287.057(1)(c), Florida Statutes, is a solicitation used by the College which is intended to determine the best method for achieving a specific goal or solving a particular problem and identifies one or more responsive vendors with which the agency may negotiate in order to receive the best value. The ITN must describe the questions being explored, the facts being sought, and the specific goals or problems that are the subject of the solicitation. The criteria that will be used for determining the acceptability of the reply and guiding the selection of the vendors with which the College will negotiate must be specified. The college shall evaluate replies against all evaluation criteria set forth in the invitation to negotiate in order to establish a competitive range with which to commence negotiations. After negotiations are conducted, the College shall award the contract to the responsible and responsive vendor that the College determines will provide the best value to the College, based on the selection criteria. e. Request for Information (RFI) is used to find out if there are companies that can provide certain goods or services, or to assist the College in better understanding what competitive or non-competitive solicitation process to use for a particular need, or to research general, special, and/or technical specifications for a solicitation. RFI's are therefore seldom the final stage, but instead are often used as the first step of a two-step solicitation process, if the College chooses. The College reserves the right to do the following after issuance of an RFI: 1) issue a formal solicitation, 2) procure goods or services without competitive solicitation based upon the exception available to the College in Florida Administrative Code Rule 6A-14.0734(2), or, 3) not to proceed to the second step of procuring goods and services. f. Request of a Letter of Interest (RLI) is a method of selecting a vendor whereby vendors are invited to submit a summary of their qualifications and state their interest in performing a specific job or service. A RLI identifies, in general terms, the work required. Responses are evaluated by an authorized panel selected by the College, mostly based on experience and qualifications.

BROWARD COLLEGE

NOTICE TO PROCEED TO CONTRACTOR

Date:
Project:
Project Number:

To: (Name of Construction Manager)

Contract For: (Description of project)

You are hereby notified that the Contract Times stated for the above project will commence on **(Date)**. On that date, start performing the obligations required by the Contract Documents. Duration of the project is _____ **business days** with a required Substantial Completion date of **(Date)**.

Before commencing Work at the Project Site, deliver the certificates of insurance and payment and performance bond as applicable and as required by the Contract Documents to the Owner.

OWNER
Broward College Authorized Owner's Representative

_____Date_____
Authorized Signature
Name, Senior Project Manager

CONTRACTOR
Contractor's Authorized Representative

_____Date_____
Authorized Signature
Company: _____
Name: _____
Title: _____

Enclosures: **Approved GMP and Approved PO**

cc: Contract Administrator, Project Manager, Construction Manager, Construction Files

BROWARD COLLEGE

Meeting #1

Broward College Facilities Mgmt.
3501 SW Davie Rd.
Davie, Florida 33314
Phone: (954) 201-6971
Fax: (954) 201-6444

Project: Insert Project Name and brief description

Pre-Construction Meeting (Building) Agenda

MEETING DATE: //

MEETING TIME:

MEETING LOCATION:

OVERVIEW:
The purpose of this meeting is to introduce everyone involve with the project and discuss the pre-construction agenda and project scope.

ATTACHMENTS:

ATTENDEES:

Name	Company	Phone Number	Email

Introductions & Attendance Sign-In

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
1.1	1	Intro			High	Open

Communication

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
2.1	1	Information Distribution			High	Open

Superintendent

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
3.1	1	Contact on Site			High	Open
	Description: Contractor will have a competent Superintendent on site at all times when work is taking place.					

Use of the Site

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
4.1	1	Project Limits			High	Open
	Description: Contractor will be in charge of the site inside the project limits.					

Project Scope and Intent

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
5.1	1	Demolition			High	Open

Meeting #1

5.2	1	Construction			High	Open

Construction Schedule / Coordination

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
6.1	1	Duration			Medium	Open
6.2	1	Contract Dates			Medium	Open
6.3	1	Hours of Operation			High	Open
6.4	1	Moving Occupants, Materials, Equipment, etc.			High	Open

Staging Area and Job Site Use

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
7.1	1	Requirements			Medium	Open

Description:

1. Plans & specs requirements
2. Site access - keys/badges/etc.
3. Job signs - coordinate with BC
4. Job trailer and parking (personal & company vehicles)
5. Security and temporary fencing
6. Material and/or debris storage & disposal
7. Deliveries & daily access
8. Disposal in accordance with documents
9. Salvage materials
10. Owner furnished items - delivery & coordination
11. Hazardous materials
12. Existing conditions of site
    a. document and review with owner & architect/engineer before construction
    b. correct and /or restore any damage to original conditions
13. Use of owner's property, power, water, telephone & other facilities
    a. notify owner of any changes

Jobsite Noise & Dust Control

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
8.1	1	Important Aspects			High	Open

Description:
Respect users. This to include but not limited to students, clients, faculty and staff. No loud music or foul language.

Utility Locates

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
9.1	1	Requirement			High	Open

Description:
Sunshine 811:

1. Every excavation requires public locates.
2. Mark work area appropriately.

Meeting #1

	3. Request 48 hours prior to starting work. 4. See additional information on their website: http://www.sunshine811.com/ Private Utility Location Services: In addition to public utility locates, GPR (Ground Penetrating Radar) underground utility locates required by BC prior to any excavation. Underground Utility Plans: Contact BC Project Manager for underground utility plans.

Meetings & Inspections

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
10.1	1	Site Inspections			High	Open
10.2	1	Progress / Coordination Meetings			Medium	Open
10.3	1	Architect & Sub-consultants Project Visits			High	Open
10.4	1	Pre-installation & Start-Up Meetings			High	Open

Quality Control

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
11.1	1	Contractor's Responsibility			High	Open
11.2	1	Owners Expects Good Quality			High	Open
11.3	1	Unacceptable Work			High	Open

Job Site Record Keeping

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
12.1	1	Contract Documents			High	Open
12.2	1	Maintaining As-Built Conditions			High	Open
12.3	1	Documents			High	Open
	Description: RFIs, CCDs, Change Orders, Daily Logs, Submittals, Shop Drawings, etc.					
12.4	1	Photo Documentation			Medium	Open
	Description: 1. Provide existing and progress photos 2. Upload photos in Procore - Photo Album - GC Progress Photos					

State Forms

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
13.1	1	Documentation			High	Open
	Description: 1. Contractor must use.					

Meeting #1

	2. Can get off web page - http://architecture.mt.gov/forms/standardforms.asp

Submittals

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
14.1	1	Pre-Construction Submittals			High	Open
	Description: 1. Schedule - milestone, critical dates and two/three week look ahead 2. Schedule of values - breakdown by division - labor & materials at minimum 3. List of subcontractors & suppliers					
14.2	1	Documents			High	Open
	Description: 1. Submittal schedule 2. long lead / special items 3. Number of copies & who gets 4. Response time 5. Substitutions 6. Format					

Request for Payment

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
15.1	1	Submittal Process			Medium	Open
	Description: 1. Procore 2. Pencil copy submitted before original copy 3. Accompanied by updated schedule if changes 4. Lien releases					

Questions & Clarifications

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
16.1	1	RFIs, Response Time & RFI Log			Medium	Open

Modifications and /or Changes

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
17.1	1	Prerequisitions			High	Open
	Description: Approval from architect/engineer before proceeding with the changes					
17.2	1	Steps			High	Open
	Description: 1. RFIs 2. Contractor or architect/engineer cost proposal 3. Construction contingency adjustment (CCA) 4. Construction change directive - change order 5. Meeting to discuss change orders & proposals					

Meeting #1

Claims & Delays						
No	**Meeting Origin**	**Title**	**Assignment**	**Due Date**	**Priority**	**Status**
18.1	1	Requirements			Medium	Open
	Description: 1. Process explained in contract documents 2. Liquidated damages					

Construction Methods and Safety Procedures (Comply with OSHA)						
No	**Meeting Origin**	**Title**	**Assignment**	**Due Date**	**Priority**	**Status**
19.1	1	Procedure			High	Open
	Description: 1. Means & methods - contractor's sole prerogative 2. Safety - responsibility of the contractor 3. Safety & construction signs - contractor's responsibility					

Testing & Inspections						
No	**Meeting Origin**	**Title**	**Assignment**	**Due Date**	**Priority**	**Status**
20.1	1	Responsibilities & Requirements			High	Open
	Description: 1. Type of test 2. Testing consultant 3. Who gets copies of reports? 4. Contractor responsible for retest 5. Quality assurance by owner is not substitute for quality control by contractor					

Commissioning						
No	**Meeting Origin**	**Title**	**Assignment**	**Due Date**	**Priority**	**Status**
21.1	1	Responsibilities & Requirements			High	Open

Training						
No	**Meeting Origin**	**Title**	**Assignment**	**Due Date**	**Priority**	**Status**
22.1	1	Requirements			Medium	Open
	Description: 1. Follow outline in specs 2. Submit agenda and list of attendance 3. Coordinate with BC					

Substantial Completion						
No	**Meeting Origin**	**Title**	**Assignment**	**Due Date**	**Priority**	**Status**
23.1	1	Completed Prerequisites			High	Open
	Description: 1. Contractual obligations fulfilled					

Meeting #1

	2. Formerly notify architect or engineer for substantial inspection 3. O & M manuals - submit as package, not bits & pieces 4. As-built Drawings

Warranty

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
24.1	1	Substantial Completion			High	Open
	Description: Starts at substantial completion and ends one (1) year from certificate of completion or certificate of occupancy.					

Final Acceptance / Closeout

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
25.1	1	Requirements			High	Open
	Description: 1. Contractual obligations fulfilled including Consent of Surety and Contractor's Affidavit 2. Date architect/engineer signs final payment application 3. Formally notify architect/engineer for final inspection 4. Punch list completed					

Concerns of the Facility User

No	Meeting Origin	Title	Assignment	Due Date	Priority	Status
26.1	1	Questions			High	Open

BROWARD COLLEGE

(TEMPLATE)
CERTIFICATE OF COMPLETION

Date:	**January 15, 2026**
Project:	**DM Exterior Waterproofing and Painting Project (B-21 and B-22)**
Project Number:	**0000-C22-03.0**
To:	**Pro Painting Enterprises, Inc.**
Work Description:	Pressure cleaning, caulking, stucco/aggregate repair, clear siloxane water repellant sealer and painting at existing buildings B-21 & B-22.

You are hereby notified that the work identified above has been reviewed and found, to Broward College's best knowledge, to be completed in accordance with all the plans, specifications and standards per the contract. As of the substantial completion date identified above, the project is considered completed, regardless of ongoing warranty or punch list work.

OWNER
Broward College Authorized Owner's Representative

_____Date_____
Authorized Signature
Robert Bellot, Senior Project Manager

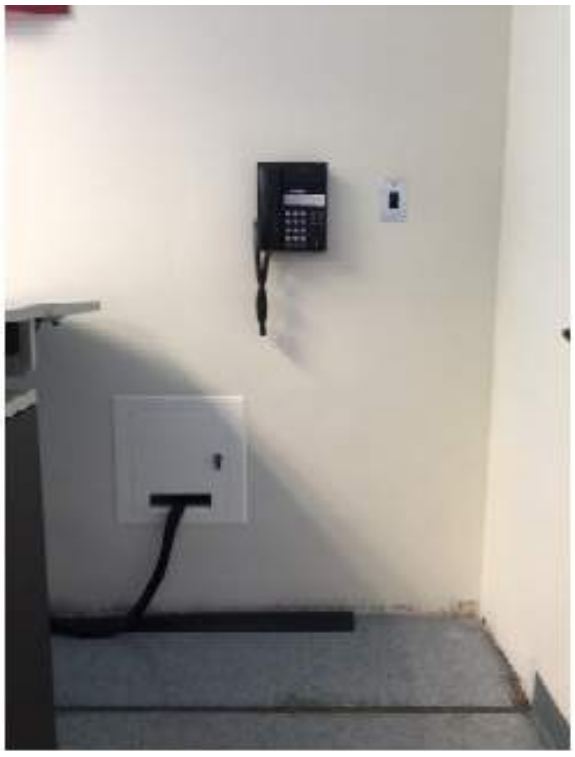
cc: Contract Administrator, Project Manager, Construction Manager, Construction Files

APPENDIX 01 03 | AUDIOVISUAL STANDARDS

1. **This document is a work in progress and is subject to change. The details shown in this document are to be used as reference, and will need to be modified to each individual project.**
2. This section contains:
   a. Classroom Standards
   b. Conference Room Standards
   c. Podium / FSR Box Detail
   d. LCD Display Mounting Detail
   e. Classroom Interactive Displays
   f. Podium Mounted AV Controls
   g. Video Conferencing
   h. Infrastructure Detail / FSR Box
   i. Infrastructure Requirements
   j. Standard Classroom Equipment

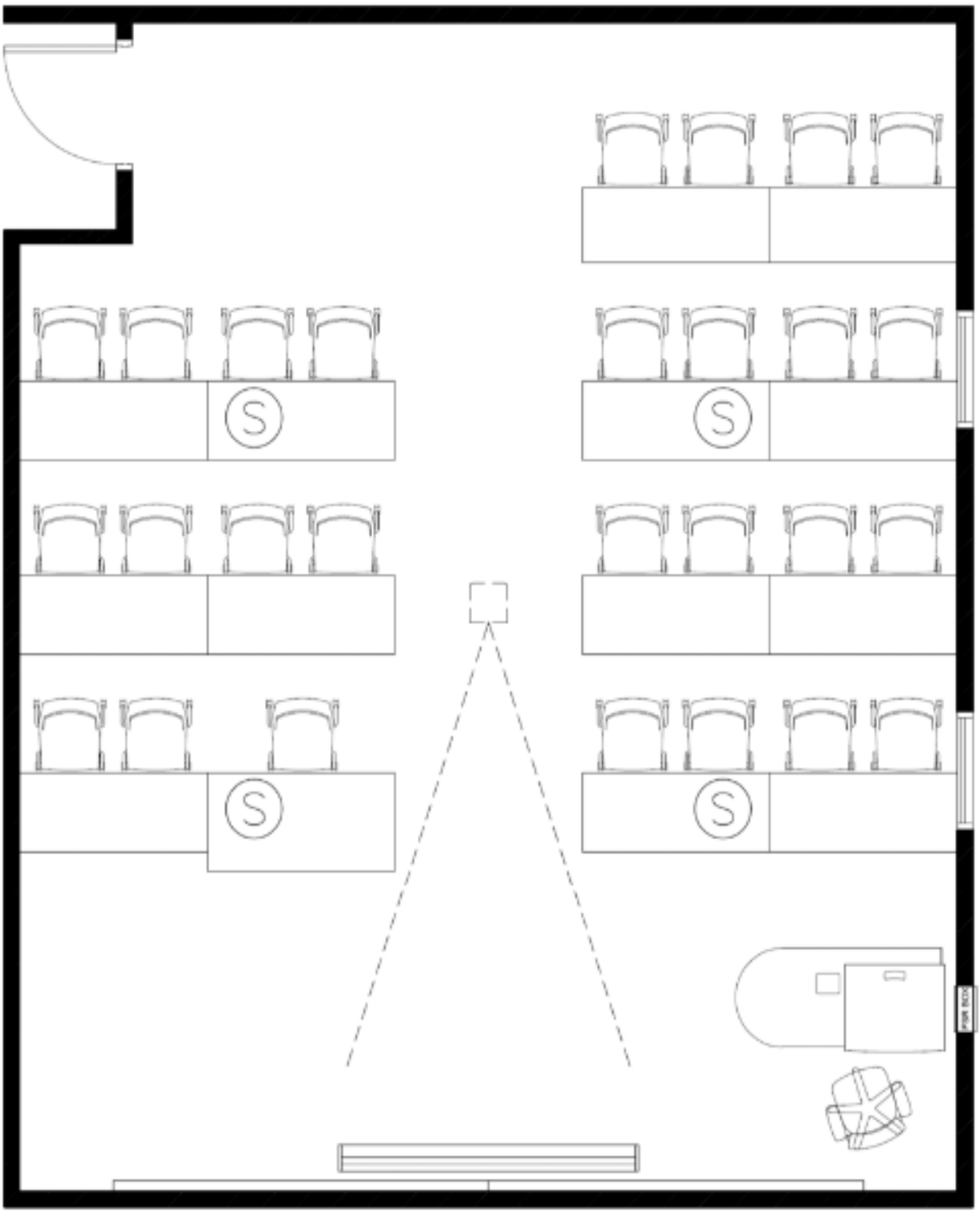
APPENDIX 01 03.01 | CLASSROOM STANDARDS

1. Purpose:
    a. The standard classroom will typically seat between 20 and 40 students. The largest projection screen possible will be installed based on the ceiling height. In some cases two projectors and screens may need to be installed in wide format rooms.
2. Furniture:
    a. Podium and Chair – College standard for most classrooms. Science installations require a different podium with a chemical resistant top. The BC facilities interior designer can obtain these specifications.
3. Display:
    a. Standard:
        i. Epson Projector or college approved replacement model
        ii. Draper Recessed 16:10 8' Projection Screen equivalent - 50" H X 80" W viewing Area
4. Computer:
    a. College standard podium computer
    b. LCD Monitor with side-mounted USB ports
5. Audio and Controls:
    a. Ceiling mounted speakers
    b. Compact audio amp installed in podium
    c. Crestron Video and Audio switching/amplification
    d. Crestron LCD Touch Panel Control
    e. Remote Management via Crestron Fusion
    f. Crestron Occupancy Sensor

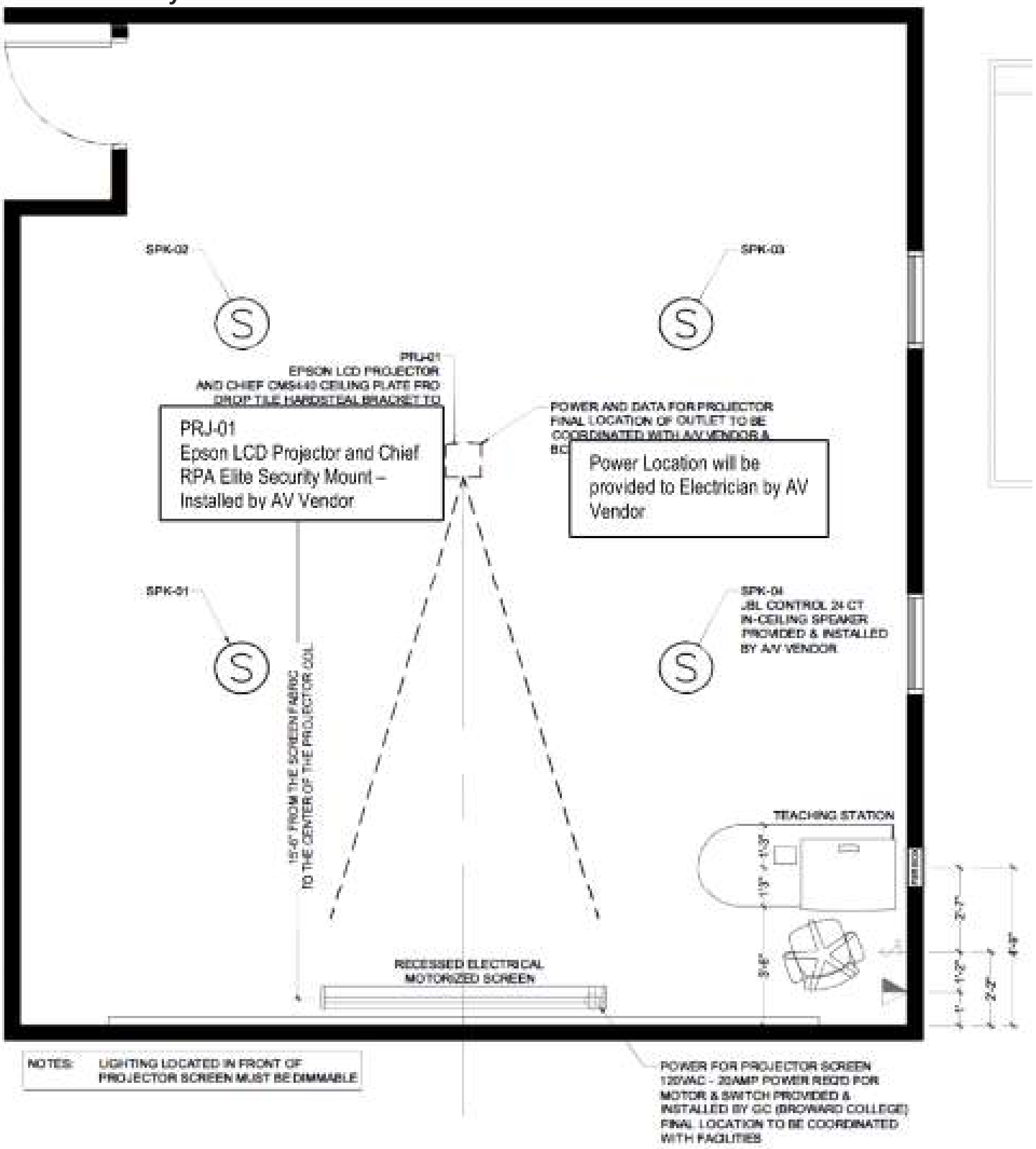


APPENDIX 01 03.01 | CLASSROOM STANDARDS

1. Classroom Plan



1. Classroom Plan
2. **NOTE: In limited cases, power, video, and data to the podium will terminate from a floor box. The Contractor will provide a floor box under the teaching station and (2) 1-1/2" conduits terminated in the ceiling closest to the podium. Power will be located under the teaching station. See Podium Layout.**



APPENDIX 01 03.01 | CLASSROOM STANDARDS

Unless otherwise noted during the site inspection, the following installation standards shall apply.

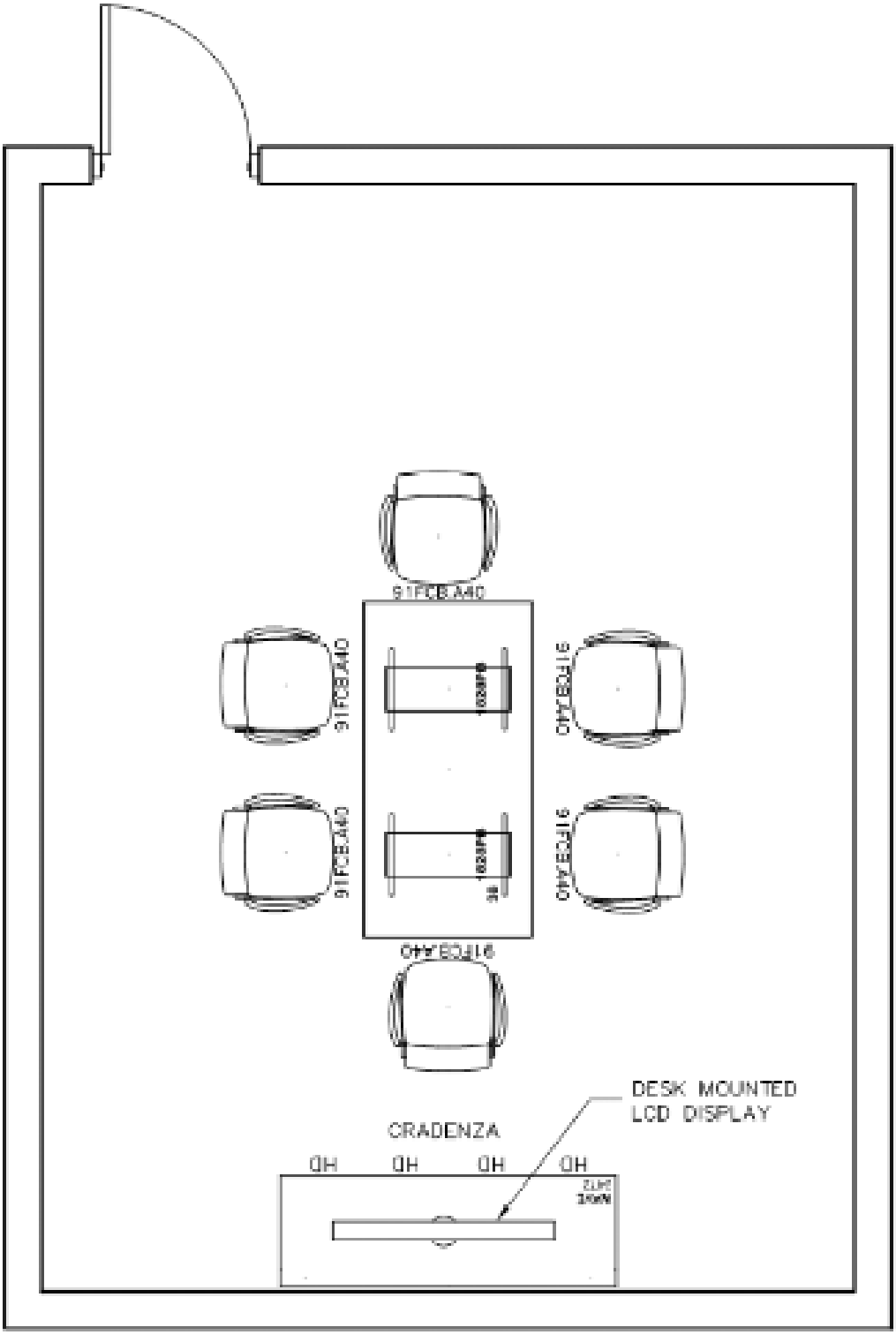
1. Standard Classroom Layouts
   a. Projection Screen will be centered on front wall of classroom if possible. Projector and screen location may change based on ceiling obstructions or other structural features. If a door opening exists, screen will be centered between door and adjacent wall.
   b. When the front of the class is also the wall with the entry door, the teaching station will be located to the side of the projection screen away from the door.
   c. FSR or multimedia box will be in the adjacent wall to the Podium. In the event the FSR box cannot be located at the podium side, the FSR box will be located behind the podium as close to the wall corner as possible to avoid a trip hazard causes by podium umbilical cord.
   d. Projector screen switch and emergency phone shall be located above the FSR box mounted and proper height to meet Code Compliance.
   e. When the front of the class is opposite the wall with the entry door, the teaching station will be located to the side of the projection screen diagonal from the door.
   f. Projector installed at the midpoint of the throw distance for the projector.
   g. Speakers will be ceiling mounted to provide consistent sound volume over the seating area. Location and quantity will be identified during site inspection.
   h. Audiovisual components may vary based on application. BC AV Solutions Leadership and Facilities Management must approve any variation from standard configurations.
   i. BC AV Solutions Leadership will select computer used in podium.
   j. Approved specs for Teaching Station/Stool

Manufacturer	Description	Part Number
AV Vendor	Rolling Rack Podium	To be provided by awarded vendor
Spectrum Industries, Inc.	Podium (Fixed)	Freedom XRS (Custom)
Spectrum Industries, Inc.	Podium (Moveable)	Freedom Pro (Custom)
KI	Stool	

APPENDIX 01 03.02 | CONFERENCE ROOM STANDARDS
CONFERENCE ROOM "A" (6 SEATS OR LESS)

1. Purpose:
   a. The configuration "A" or Small Conference Room typically seats less than six. The purpose of the conference room is for small team or department meetings and video conferencing using Microsoft Lync. This conference room is not intended for academic instruction.
2. Furniture:
   a. Table Dimensions: (Provided by BC Interior Design Specialist)
   b. Chairs: (Provided by BC Interior Design Specialist)
3. Display:
   a. Standard:
      i. Epson Projector or college approved replacement model
      ii. Draper Recessed 16:10 8' Projection Screen equivalent - 50" H X 80" W Viewing Area
   b. Optional:
      i. 70" Professional Grade LCD/LED Display, wall-mounted
      ii. If necessary, vendor will supply an OTA digital antenna and HD tuner for LCD Displays and projectors in conference room configurations.
4. Computer:
   a. College standard podium computer – Installed in credenza or under table
   b. RF Wireless keyboard and mouse
5. Audio and Controls:
   a. Crestron Mercury
6. Video Conferencing Camera:
   a. Standard:
      i. Logitech HD Pro Webcam C920, 1080p Video, Auto Focus
7. Conference Phone
   a. Crestron Mercury will provide audio from Skype/MS Teams.

CONFERENCE ROOM "A" (6 SEATS OR LESS)



APPENDIX 01 03.02 | CONFERENCE ROOM STANDARDS
CONFERENCE ROOM "B" (6-12)

1. Purpose:
   a. The configuration "B" or Medium Conference Room typically seats between six and twelve users. The purpose of the conference room is for team or department meetings and video conferencing using Microsoft Lync. This conference room is not intended for academic instruction.
2. Furniture:
   a. Table Dimensions: (Provided by BC Interior Design Specialist)
   b. Chairs: (Provided by BC Interior Design Specialist)
3. Display:
   a. Standard:
      i. Epson Projector or college approved replacement model
      ii. Draper Recessed 16:10 8' Projection Screen equivalent - 50" H X 80" W Viewing Area
   b. Optional:
      i. 80" Professional Grade LCD/LED Display, wall-mounted
      ii. If necessary, vendor will supply an OTA digital antenna and HD tuner for LCD Displays and projectors in conference room configurations.
4. Computer:
   a. College standard podium computer – Installed in credenza or under table
   b. RF Wireless keyboard and mouse
5. Audio and Controls:
   a. Ceiling mounted speakers
   b. Ceiling mounted microphones for video conferencing
   c. Compact audio amp installed in credenza
   d. Crestron Video and Audio switching/amplification
   e. Crestron LCD Touch Panel Control
   f. Remote Management via Crestron Fusion
   g. Crestron Occupancy Sensor
6. Video Conferencing Camera and Audio
   a. Standard:
      i. Vaddio Zoom Shot Camera and Audio Module utilizing ceiling microphones

7. Conference Phone:
   a. Polycom SoundStation Duo

CONFERENCE ROOM "B" (6-12)

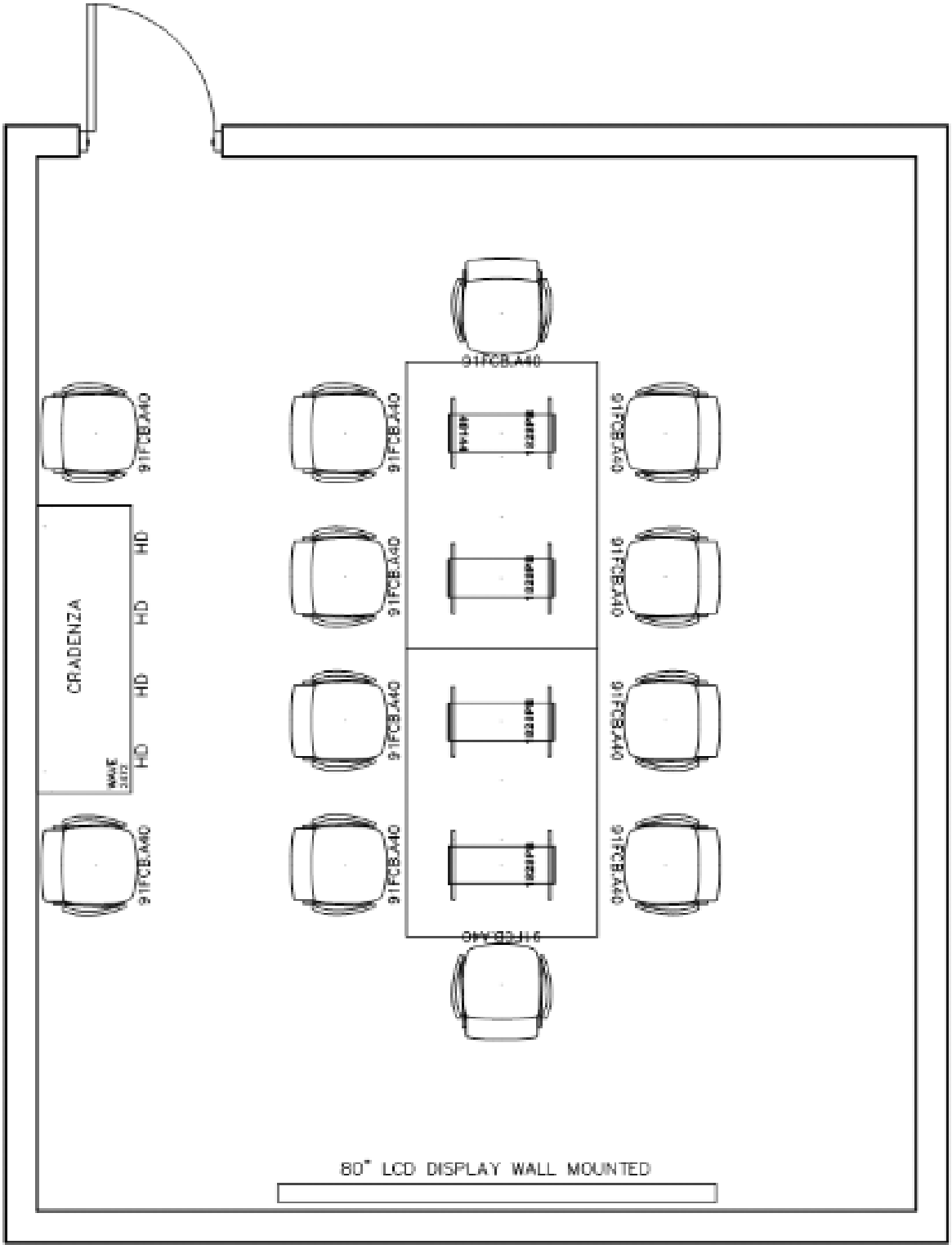
8. Conference Table Pop Ups (Video, Data, and Power access):
   a. (1) Large Altinex Pop-Up boxes to be located at the center of the Conference Table – Delete composite – add USB

9. Conference Table Pop-Ups:
   a. (2) Small Altinex Pop-Up boxes to be located at each end of the Conference Table

**** Connections in these boxes will change with regard to connectivity requirements of the conference room and technology advances ****

10. Credenza:
    a. Furniture provided by BC to house the AV equipment
    b. Typical rack installed in an approved credenza. The Credenza designed for multimedia components have necessary vents, power, space for equipment racks, and IR extenders (built in the furniture).

CONFERENCE ROOM "B" (6-12 SEATS)



CONFERENCE ROOM “B” (6-12 SEATS)

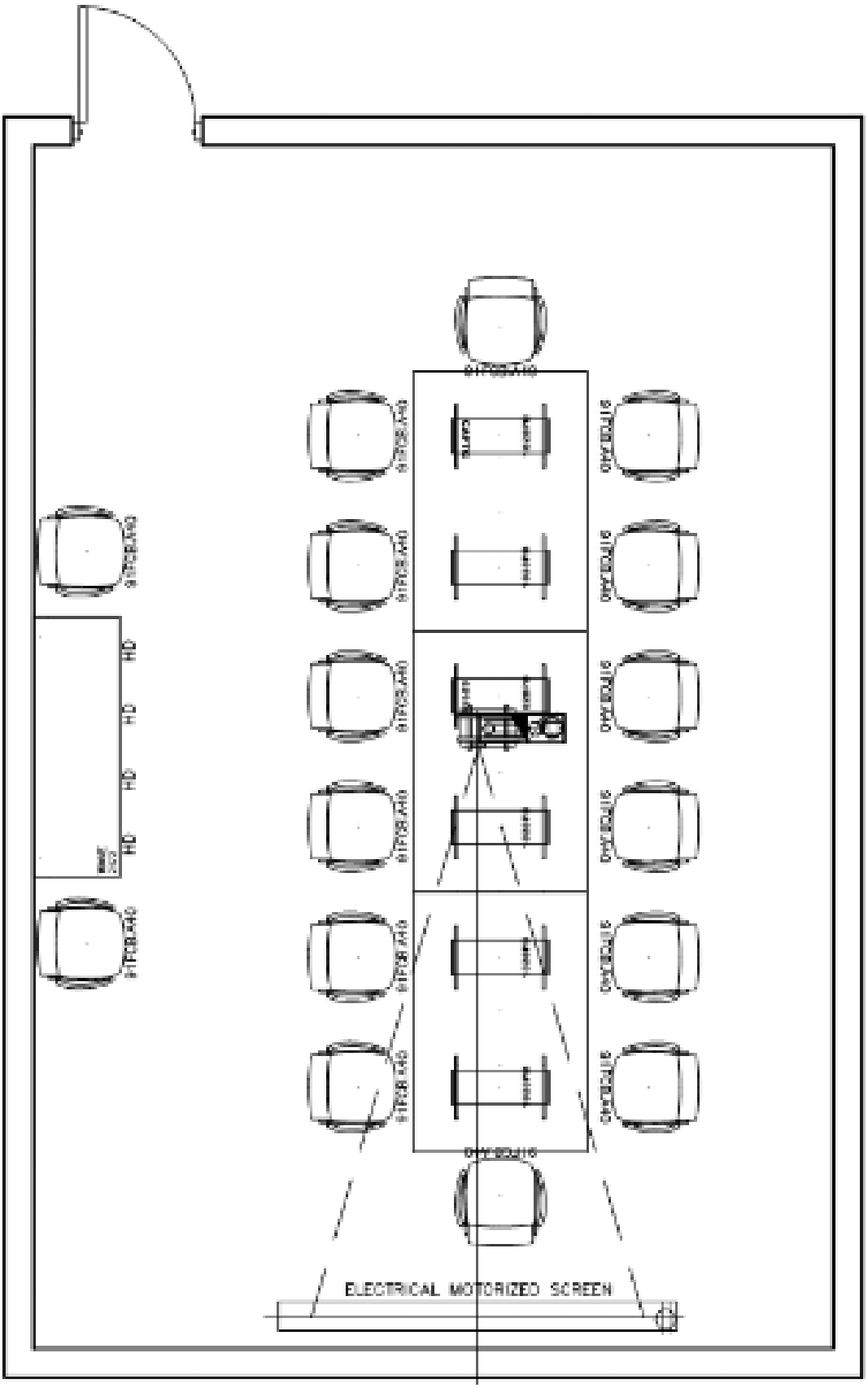
APPENDIX 01 03.02 | CONFERENCE ROOM STANDARDS
CONFERENCE ROOM "C" (11-20 SEATS)

1. Purpose:
   a. The configuration "C" or Large Conference Room typically seats between eleven and twenty users. The purpose of the conference room is for division or department meetings and video conferencing using Lync video conferencing. The primary difference between the medium and large conference room is additional ceiling microphones, A DSP, and speakers.. This conference room is not intended for academic instruction.
2. Furniture:
   a. Table Dimensions: (Provided by BC Interior Design Specialist)
   b. Chairs: (Provided by BC Interior Design Specialist)
3. Display:
   a. Standard:
      i. Epson Projector or college approved replacement model
      ii. Draper Recessed 16:10 10' Projection Screen equivalent - 65" x 104" W Viewing Area
   b. Optional:
      i. 90" Professional Grade LCD/LED Display, wall-mounted
      ii. If necessary, vendor will supply an OTA digital antenna and HD tuner for LCD Displays and projectors in conference room configurations.
4. Computer:
   a. College standard podium computer – Installed in credenza or under table
   b. RF Wireless keyboard and mouse
5. Audio and Controls:
   a. Ceiling mounted speakers
   b. Ceiling mounted microphones for video conferencing
   c. Compact audio amp installed in credenza
   d. Crestron Video and Audio switching/amplification
   e. Crestron LCD Touch Panel Control
   f. Remote Management via Crestron Fusion
   g. Crestron Occupancy Sensor
6. Video Conferencing Camera and Audio
   a. Standard:
      i. Vaddio Zoom Shot Camera and Audio Module utilizing ceiling microphones

7. Conference Phone:
   a. Polycom SoundStation Duo

8. Conference Room Pop-Ups and Floor Cable Management
   a. These are the same products as used in the Config "B" Medium conference room.

CONFERENCE ROOM "C" (11-20 SEATS)



APPENDIX 01 03.02 | CONFERENCE ROOM STANDARDS
CUSTOM / MULTIPURPOSE CONFERENCE / TRAINING ROOM “D”

1. Any room accommodating more than 20 people will be specified and quoted custom design per room.

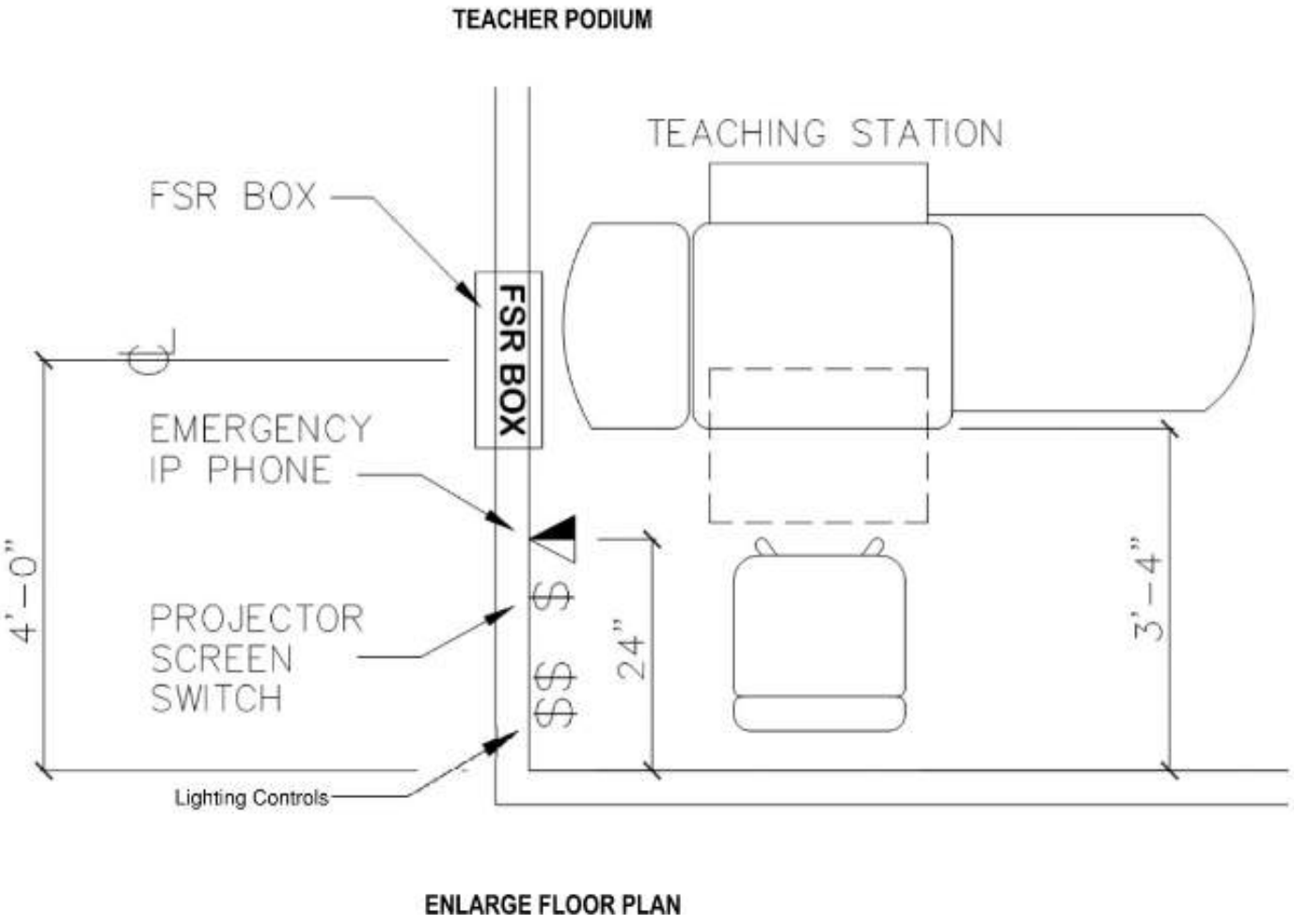
APPENDIX 01 03.03 | PROJECT INSTALLATION STANDARDS
INSTRUCTIONS FOR THE AUDIOVISUAL CONTRACTOR

1. BC may provide a storage room at location for staging equipment and Vendor will be responsible for all equipment up until the Installation is complete and final walk-thru (signed-off) by BC.
2. All cable installation must meet State Requirement for Educational Facilities (SREF) and Local Code Compliance and BC Specifications as noted below but not limited to:
3. The project GC or electrician, will patch and paint all wall penetrations to match existing finishes. In addition, replace baseboard, carpet, chair rail, and ceiling tiles, if disturbed by the installation process.
4. All cables shall be routed above ceiling following the building lines. Place the cable where frequent changes in elevation can be avoided.
5. Install cable as high as practicable while maintaining a minimum distance of 24" above the finished ceiling.
6. Route cables away from equipment or building service areas and access panels ensuring proper working clearance.
7. Support cables independently from the building structure at maximum intervals of 48" with J-hooks.
8. Do not place cable on or use as a method of support other building systems such as HVAC ductwork, electrical conduits, fire sprinkler systems, water, sewer, drainage piping, etc. Do not attach cable supports to ceiling grid hanger wire.
9. When hanging hooks on drywall attach with sheet metal of sufficient length to be secured directly to the framing member.
10. When hanging hooks on concrete walls systems attach a plain hook with a plastic anchor and sheet metal screws or Tapcons. The fasteners shall be a minimum of 1" in length.
11. When hanging hooks on the building steel use the type with an integral or independent spring steel or set screw style beam clamp. Do not drill or cut structural steel members.
12. Support cable in other areas with ¼" all-thread attached to a steel structural member with a beam clamp or concrete anchor directly in the deck above. Attach the lower end of the rod to the ceiling grid using an Erico 3114Z34 drop rod securing clip or approved equal. Trim excess rod to within 1" of the spring steel "batwing". Install cable hooks with spring steel clips that are designed to attach directly to the rod such as Erico CAT214Z34.
13. Install all hangers plumb. The cable route selected shall allow for the drop rod clips to be placed at ceiling grid element joints. Clips & hangers maybe installed mid-span only to provide support around an obstacle or meet the minimum support requirements at the grid.
14. Secure cables to the hooks with cable ties. Provide plenum rated cable ties where required.
15. All cables that routed in the same direction shall be grouped (no fanning) together with maximum sag of 3" between supports.
16. Install a cable support within 24" of projector mast. Dress a 12" diameter service loop in the AV cabling and hang at this interval. Route the cable from the top of the service loop to the projector mast and secure with a cable tie and at maximum intervals of 12" to the finished ceiling. Secure the cable to the mast 6" above the ceiling tile. Secure loop with a minimum of 3 cable ties spaced equally around the loop.
17. Install a cable support within 6" of AV outlet conduit stub. Dress a 12" diameter service loop in the AV cabling and hang at this interval. Route the cable from the top of the service loop into the conduit stub. Secure the service loop with a minimum of 3 cables spaced equally around the loop.
18. Each room will have teaching station provided by BC. Vendor will install the media touch panel to the left of the monitor on the teaching station.
19. For a standard teaching station installation: FSR multimedia box will be installed by the Electrician. The AV Vendor will install the appropriate finish plate (inside the FSR unit) populated () RJ45 Data Connections, Speakon connector (for ceiling speaker output), (1) RJ-45 connection for HDMI over Cat5e, or Cat6. All FSR boxes should have a wire tie restraints for cables inside of box so flap will close.
20. Other, non-standard, AV installations may have variations regarding the number of connections and plate/jack termination.
21. Cables from workstation to FSR box should be pulled through a cutout on side of workstation and housed in a 12' black snake-skin umbilical. Cradle tie wraps should be used to fasten cables on inside of teacher's desk.

INSTRUCTIONS FOR THE AUDIOVISUAL CONTRACTOR

22. Altinex popup (Model TNP512C or equivalent) on teacher desk will be populated with (1) HDMI, (1) VGA, (1) audio 3.5 mm. (1) RJ-45, (2) power outlets
23. Flat Panel Display installations, Vendor will mount equipment using 3/4" fire treated plywood black backer and the designated wall mount bracket. Wall plate for LCD Display will be populated with (2) RJ45 connectors (1) for HDMI over CAT5e, or CAT6, and (1) Network for the display. A simple antenna to provide access to broadcast television will be installed above the ceiling
24. Structure to ceiling tile varies by room. Ceiling tiles size varies. Floor to ceiling height varies in every room. Walls are drywall.
25. Remove and discard old AV cabling from previous installations.
26. BC will indicate final location of screen and projector.
27. Vendor will provide all tools and accessories needed. Vendor will not borrow ladders or any other equipment from the college or other vendors.
28. Vendor will not stand on desk or chair to reach ceiling. Equipment is not allowed to be placed on furniture.
29. Vendor will be responsible for any ceiling tile breakage resulting from the AV installation.
30. Vendor will clean up all construction debris by the end of the work period for that day if the installation is taking place in an active classroom.
31. All AV cables will be free run and tie wrapped in podium rack to all components and wall plate.
32. Quotes must be submitted by line item according to resulting contract and must be valid for at least 90 days.
33. AV Vendor shall be responsible for verifying all equipment is installed and operational before scheduling a final inspection with the college and permitting agency. The College must approve any sign-off forms and payment will be made only when an authorized individual signs the form. Once the sign-off forms are signed, a copy of the PO, original proposal, MEP inspection report, and invoice need to be submitted as a package to the job project manager.

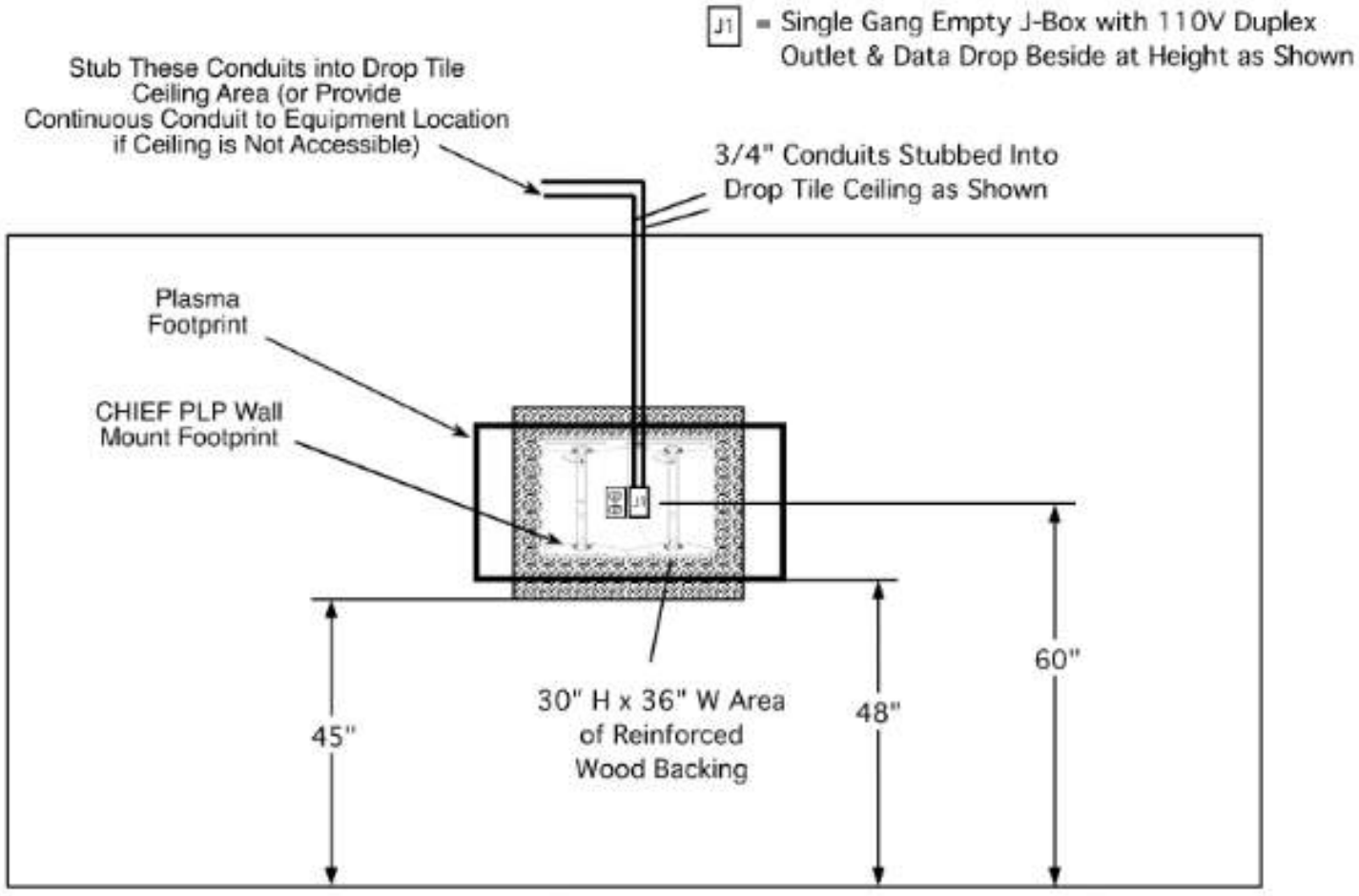
APPENDIX 01 03.04 | PODIUM FSR BOX DETAIL



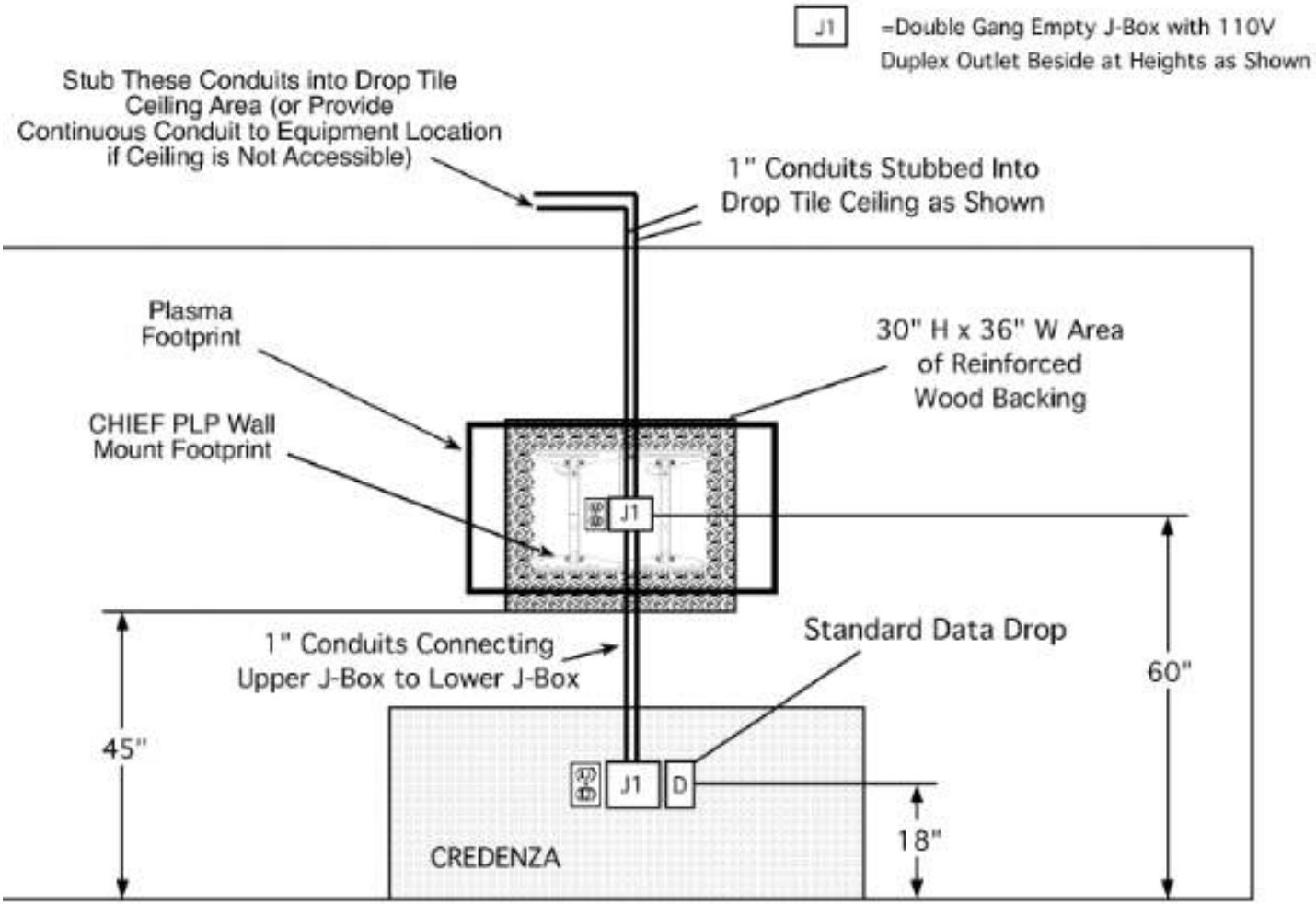
APPENDIX 01 03.05 | LCD MOUNTING DETAIL

INTERIOR WALL ELEVATION - LCD DISPLAY

1. For applications (such as conference rooms) that require the installation of a LCD Display.
2. For LCD Displays, the following installation specs will apply:



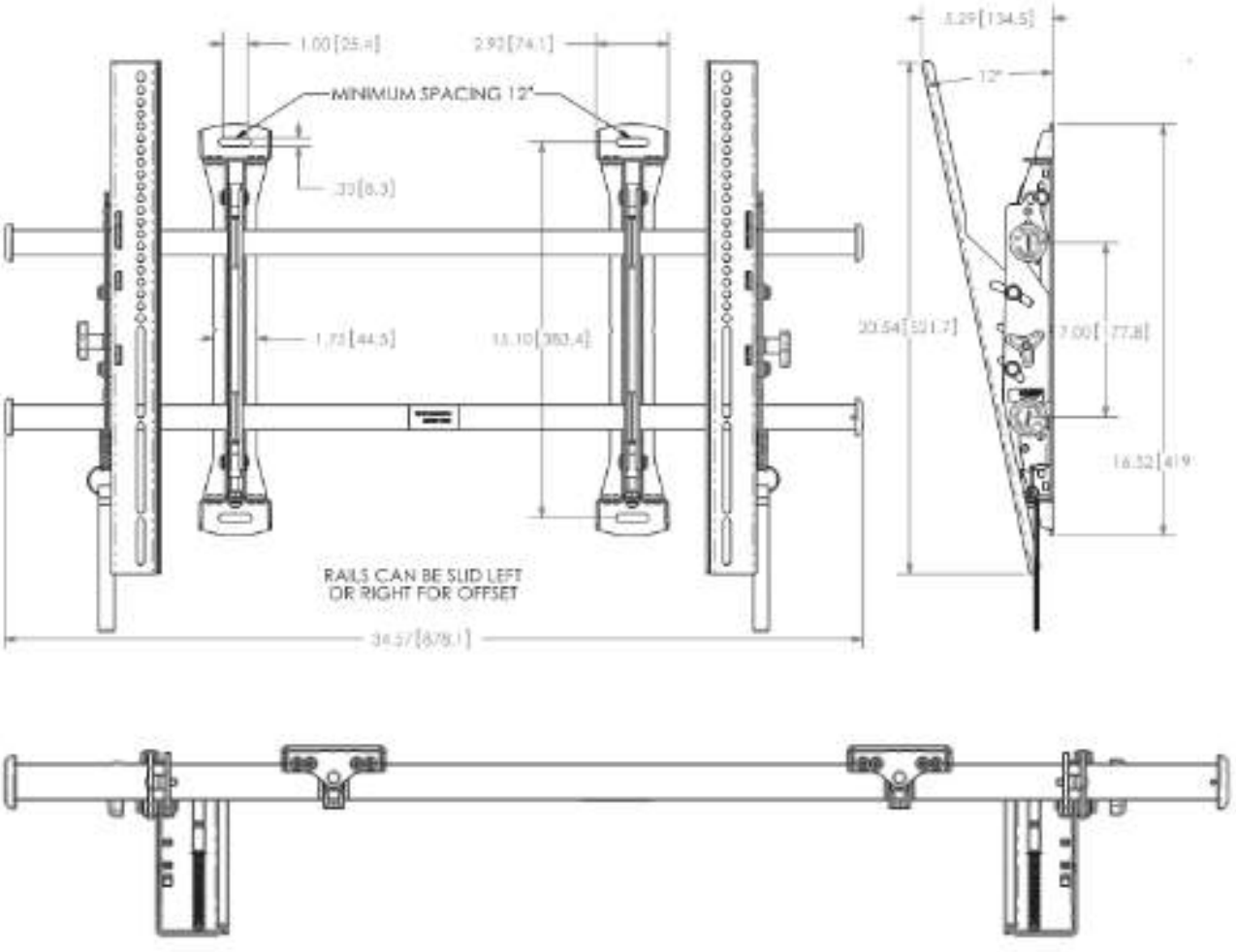
APPENDIX 01 03.05 | LCD MOUNTING DETAIL
INTERIOR WALL ELEVATION - LCD DISPLAY ABOVE CREDENZA



APPENDIX 01 03.05 | LCD MOUNTING DETAIL
LCD WALL BRACKET

LARGE FUSION MICRO-ADJUSTABLE TILT WALL MOUNT

Overall Dimensions (H x W x D): 16.5" x 34.4" x 2"

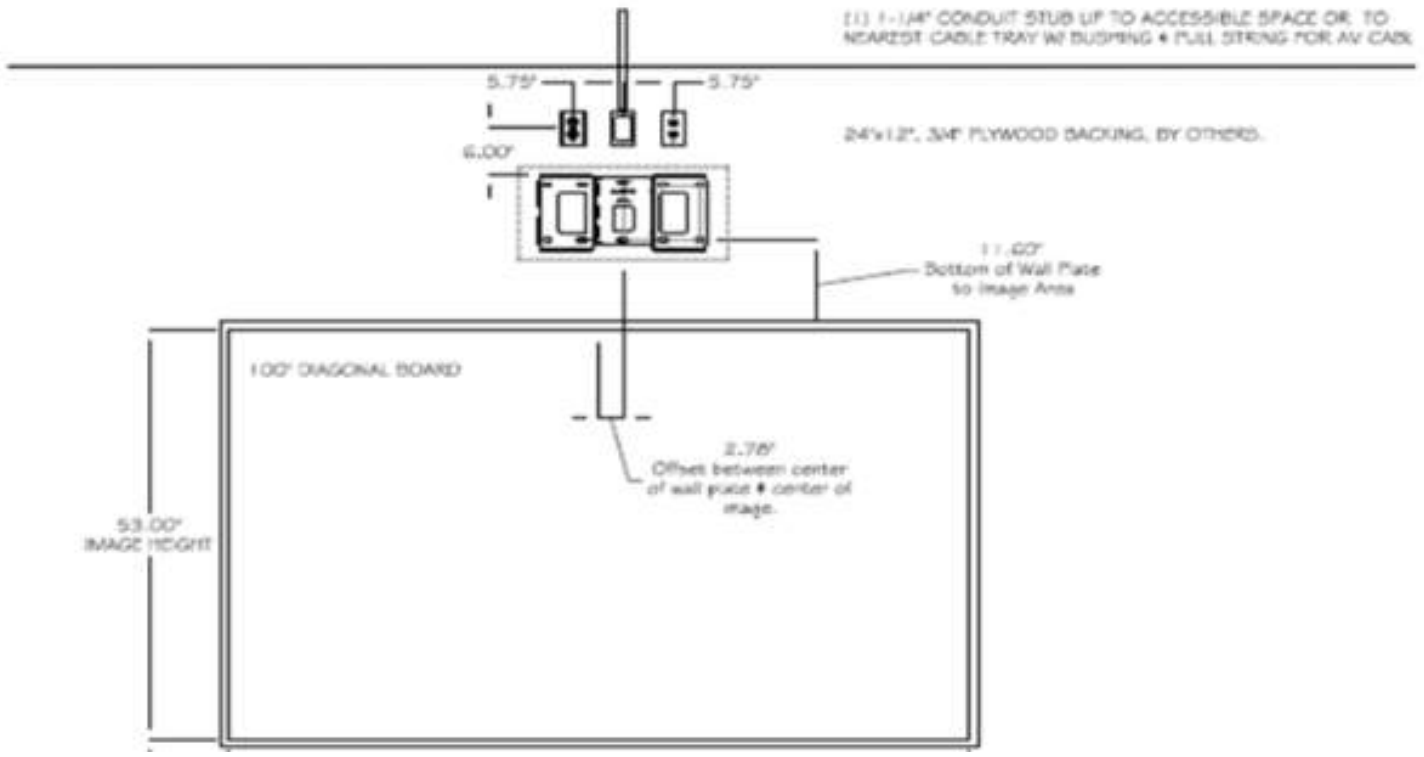


APPENDIX 01 03.06 | CLASSROOM INTERACTIVE DISPLAYS

INTERACTIVE BRIGHTLINK

1. The projector bracket location must be on an existing wall stud within the 12" width of the bracket to support the projector or backing that is installed in the wall at bracket location. For the best results without adding backing, find the wall stud closest to the center of the board location and install the power on one side. Provide a single gang AV box at 100" AFF to the center of the boxes with a (1-1/4" min.) conduit stubbed into the accessible ceiling for AV cabling.
2. BrightLink (Option)
   a. Owner Responsibilities - Broward College will:
      i. Provide infrastructure for BrightLink
      ii. Remove existing chalk board
   b. AV Vendor Responsibilities:
      i. Install BrightLink – top of board 81.5" AFF. Center of BrightLink will be different for each installation.
      ii. Install new custom decora plate in FSR box
      iii. Install custom DALITE/DRAPER whiteboard depending on size
3. Notes:
   a. A new processor may be required for this installation.
   b. BrightLink power will be controlled by the existing Crestron touch panel. Only the desktop computer output will be seen on the BrightLink Projector.
   c. When pulling cables – follow building lines. Cables above ceiling should be run vertically 48" max run between fasteners (sleeve anchors & tapcons). Hiltys can be used when installing hangers. Fender washers should not be used. Threaded rod will be installed where appropriate in every room. Whenever possible, put hooks on wall instead of ceiling.

Epson BrightLink



Epson BrightLink - ELEVATION

FRONT VIEW

DEVICE SECTION VIEW

APPENDIX 01 03.07 | PODIUM MOUNTED AV CONTROL

CRESTRON CONTROL

TOUCH PANEL ON TEACHER PODIUM

APPENDIX 01 03.07 | PODIUM MOUNTED AV CONTROL
PODIUM AV EQUIPMENT RACK

ALTINEX POPUP - COMPOSITE & AUDIO NO LONGER SUPPORTED

AV CONFERENCE TABLE POPUPS (SMALL POPUPS SHOWN)

ZOOMSHOT - WALL MOUNTED

ROBOSHOT - CEILING OR WALL MOUNTED

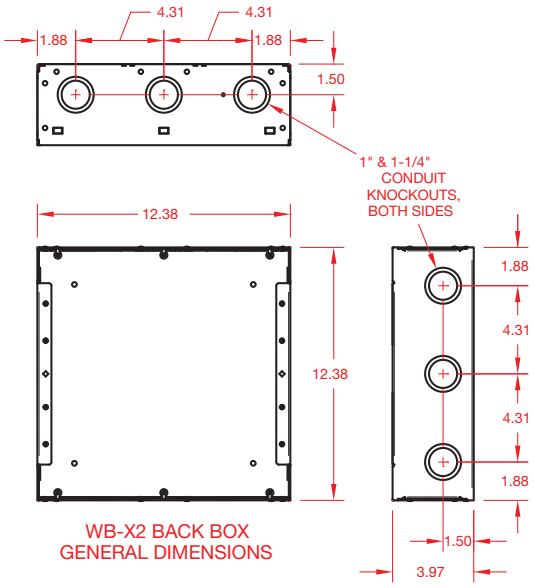
APPENDIX 01 03.08 | VIDEO CONFERENCING
VIDEO CONFERENCE PHONE

CEILING MICROPHONE

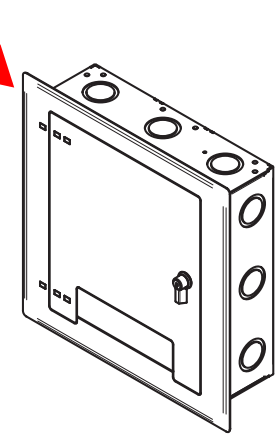
APPENDIX 01 03.09 | INFRASTRUCTURE DETAIL - FSR BOX
FSR MULTIMEDIA BOX (COVER MUST BE FLUSH MOUNTED)

NOTE: If the walls are painted black, select WB-X2-CVR-BLK

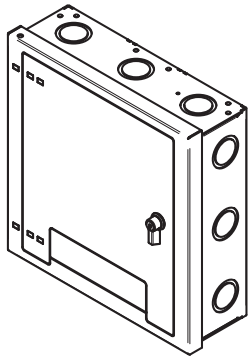
WB-X2



WB-X2 BACK BOX
GENERAL DIMENSIONS

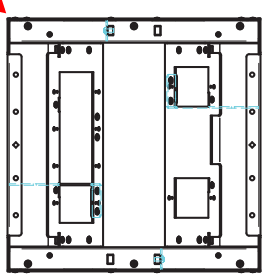


WB-X2-CVR
FLUSH-MOUNTED COVER
(SHOWN WITH BACK BOX)

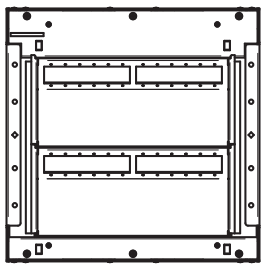


WB-X2-SMCVR
SURFACE MOUNTED COVER
(SHOWN WITH BACK BOX)

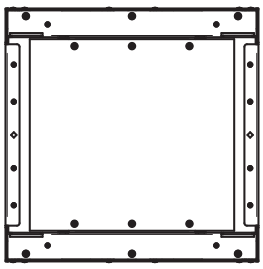
MODEL	FEATURES
WB-X2-GNG	BACK BOX, (2) 1 GANG AND (1) 4 GANG OPENINGS IN 2 ROWS w/KO's
WB-X2-IPS	BACK BOX, (24) IPS SLOTS, 2 ROWS OF 12 IPS SLOTS w/KO's
WB-X2-PLT	BACK BOX ONLY w/KO's
WB-X2-XLR	BACK BOX, (24) XLR HOLES, 3 ROWS OF 8 XLR HOLES w/KO's
WB-X2NK-GNG	BACK BOX, (2) 1 GANG AND (1) 4 GANG OPENINGS IN 2 ROWS w/o KO's
WB-X2NK-IPS	BACK BOX, (24) IPS SLOTS, 2 ROWS OF 12 IPS SLOTS w/o KO's
WB-X2NK-PLT	BACK BOX ONLY w/o KO's
WB-X2NK-XLR	BACK BOX, (24) XLR HOLES, 3 ROWS OF 8 XLR HOLES w/o KO's
WB-X2-CVR-BLK	LOCKING COVER, BLACK
WB-X2-CVR-WHT	LOCKING COVER, WHITE
WB-X2-SMCVR-BLK	LOCKING COVER, BLACK (SURFACE MOUNT)
WB-X2-SMCVR-WHT	LOCKING COVER, WHITE (SURFACE MOUNT)



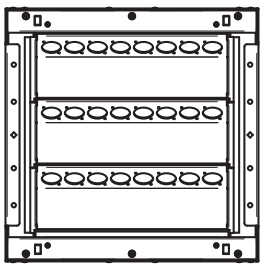
WB-X2-GNG
BACK BOX



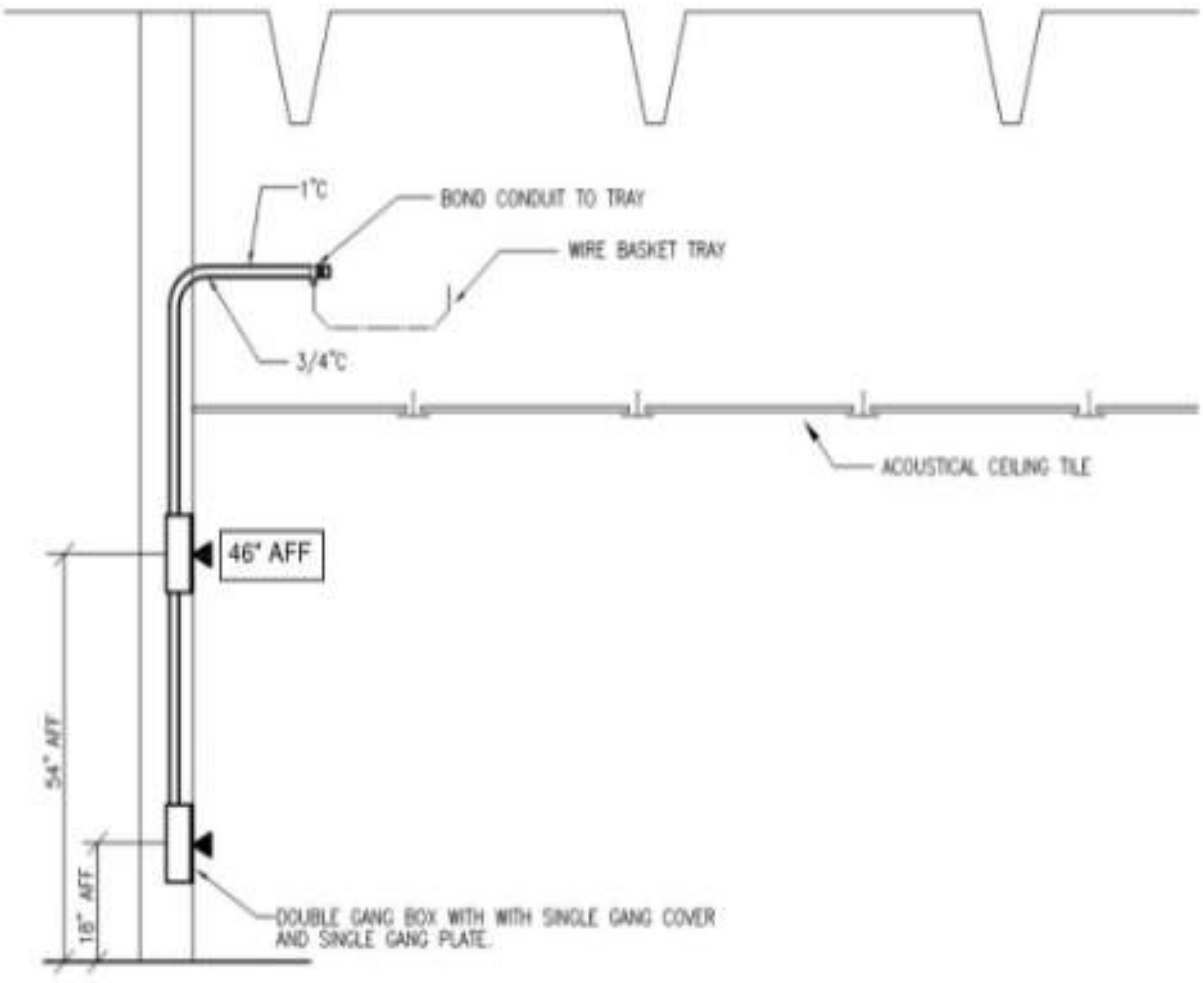
WB-X2-IPS
BACK BOX



WB-X2-PLT
BACK BOX



WB-X2-XLR
BACK BOX



TYPICAL TEACHER STATION VOICE/DATA DETAIL

NO SCALE

Notes:

- PROVIDE NYLON BUSHINGS AT BOTH ENDS OF CONDUIT
- COORDINATE LOCATION OF PROJECTION UNITY WITH ARCHITECTUAL DRAWINGS

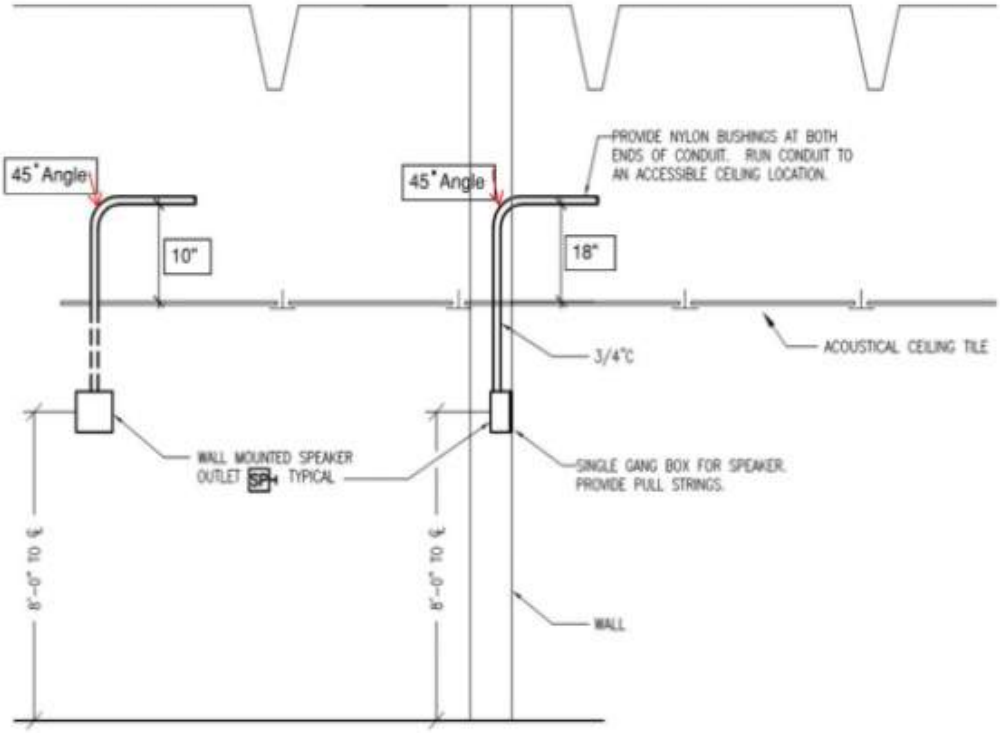
SYMBOL INDICATES RACEWAY/OUTLET BOX PROVISION FOR FUTURE.

◀ SYMBOL INDICTAES CABLES. (VERIFY WITH BC ELECTRICAL DEPARTMENT)

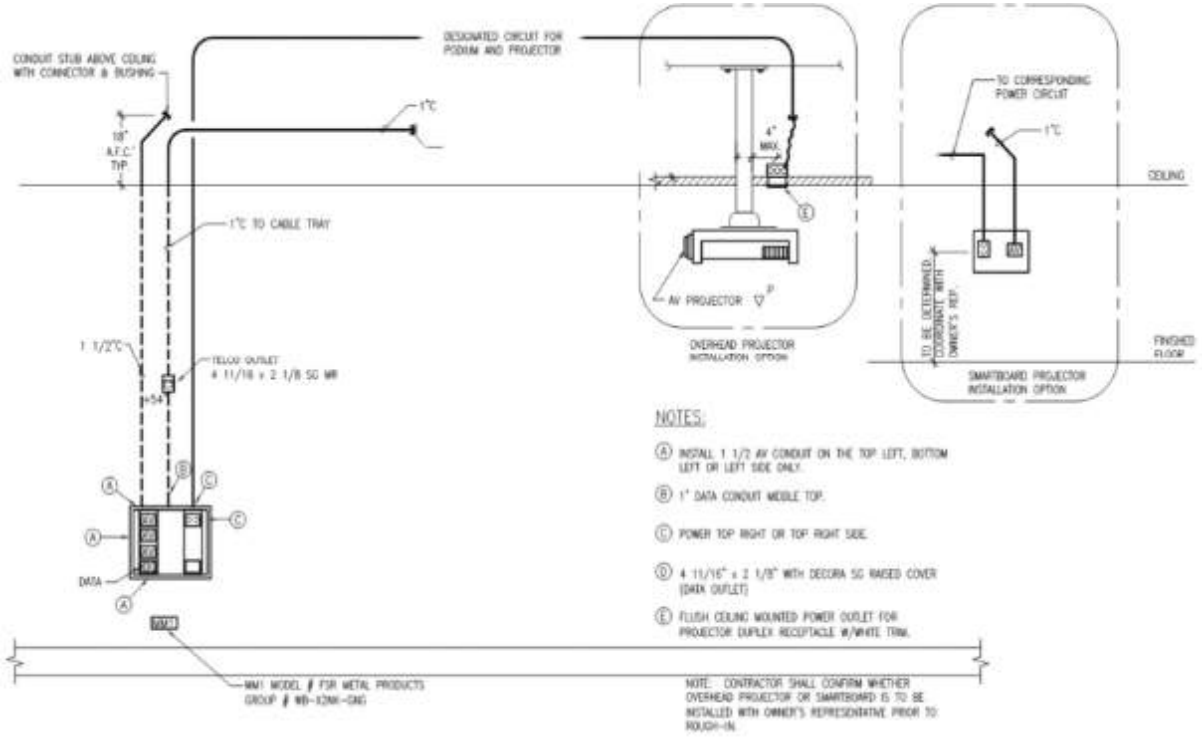
BUILDING 72 DETAIL

NOTES:

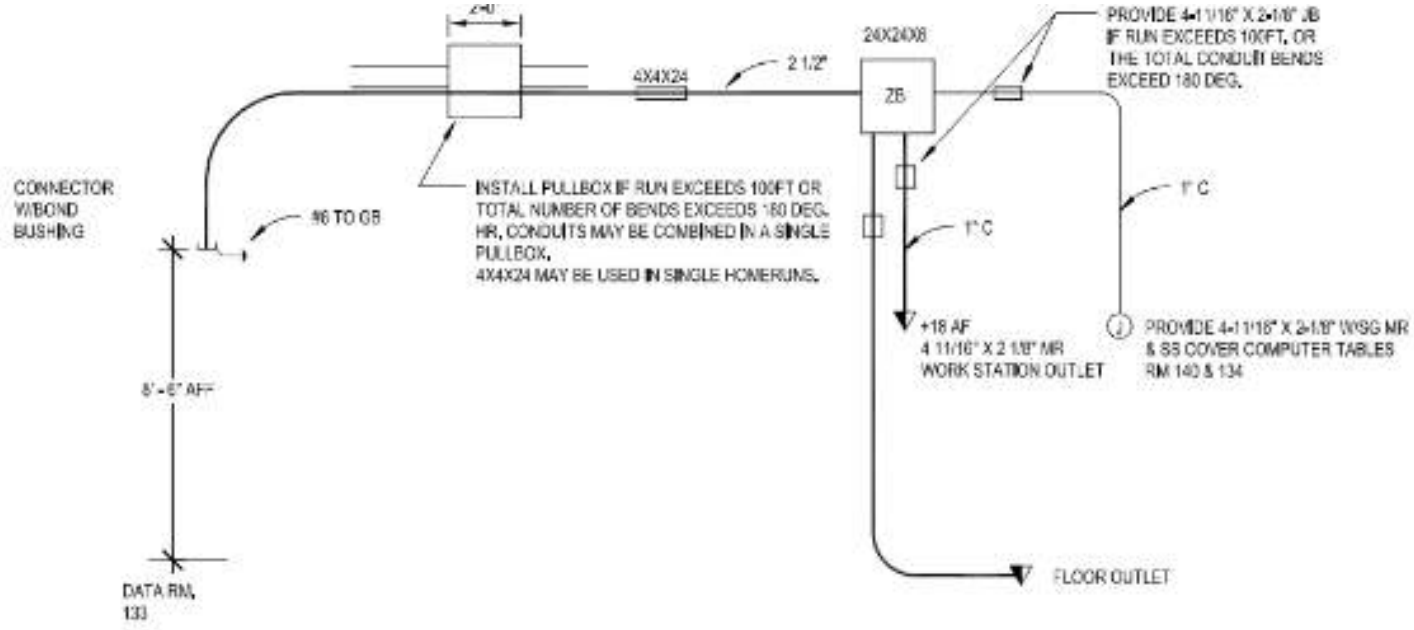
1. Ceiling mounted speakers; do not secure raceway.
2. Speakers are provided and installed by Broward College. Contractor to provide a typical ceiling speaker rough-in installation.



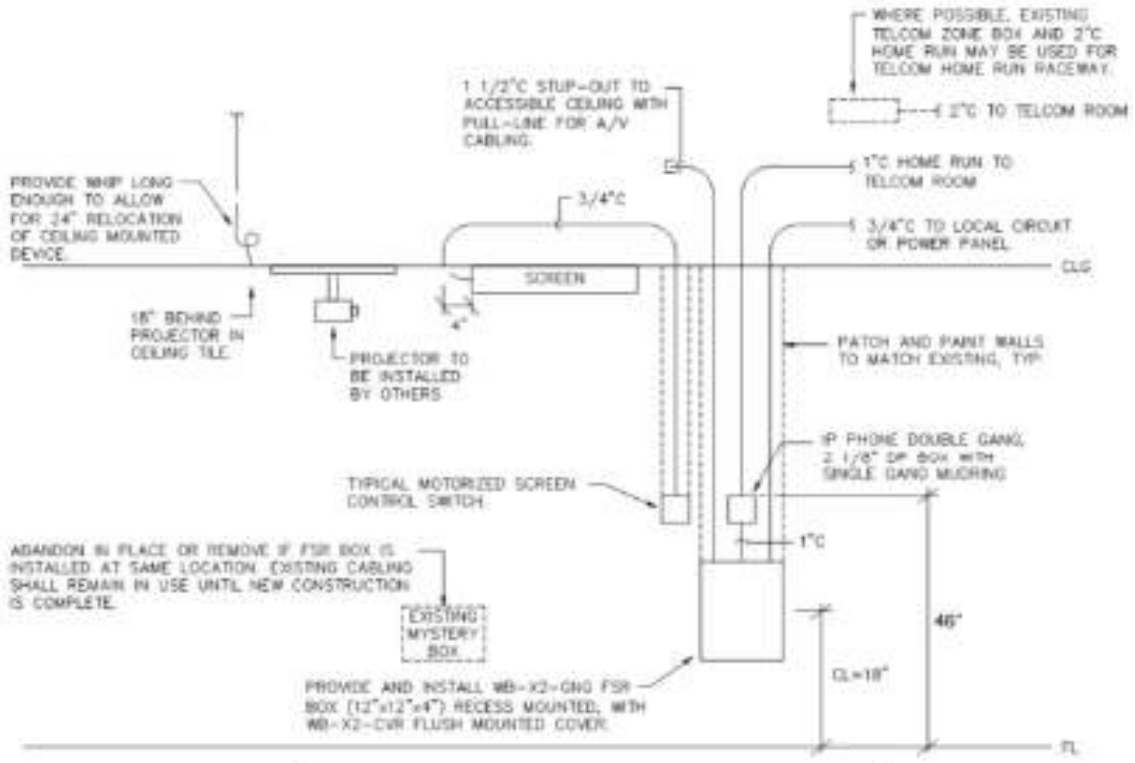
AV OUTLET INSTALLATION



APPENDIX 01 03.10 | INFRASTRUCTURE REQUIREMENTS
CEILING MOUNTED RECEPTACLE / DATA OUTLET FOR SCREEN PROJECTOR

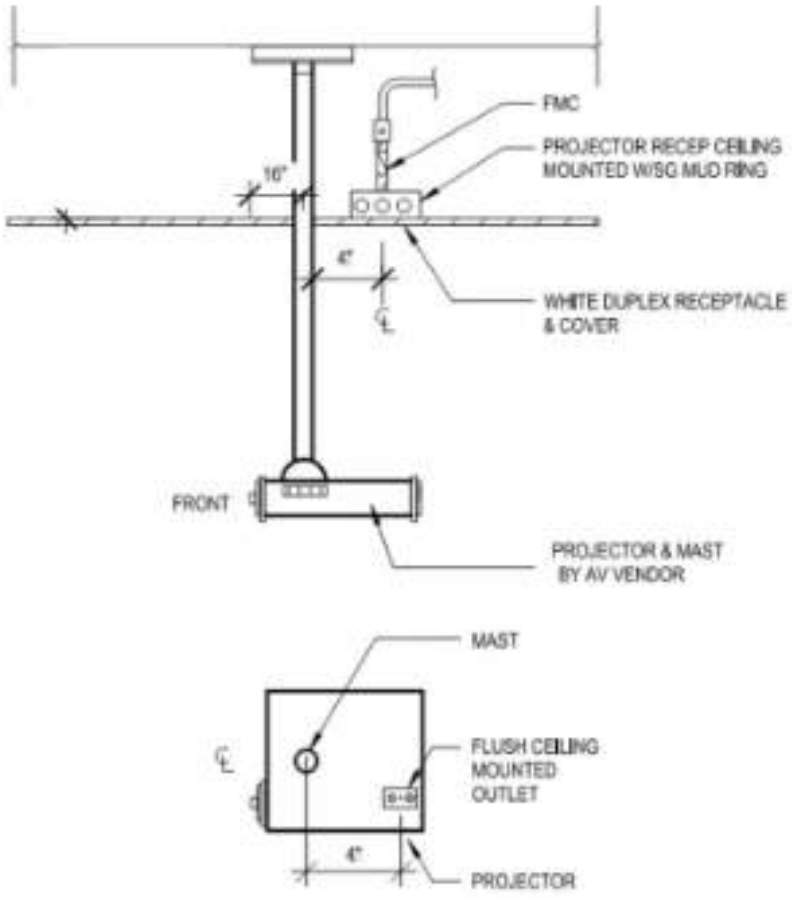


TYPICAL AV INFRASTRUCTURE REQUIREMENT



PROJECTOR

PROJECTOR MOUNT DETAIL & PLAN VIEW



APPENDIX 01 03.11 | STANDARD CLASSROOM EQUIPMENT
ROLLING RACK - OPTION "A"

1. Middle Atlantic
   a. Model: PTRK-MDK14
   b. 14-Space (24-1/2"), with plex-front door & marble graphite laminate top, with casters and shelf

SPECTRUM INDUSTRIES INC.
PO Box 400, Chippewa Falls, WI 54729
715-723-6750 | spectrumfurniture.com

NON-STANDARD DETAIL SHEET

Product Type	Custom	Phantom ☐	cp
Item Number	55418-20227	Item Reference	55418FMFMSS1F00000L3015
Description	Freedom XRS Srnd FT2-202 2" Grmt Broward College FMFMS		

Laminate	Fusion Maple
Edgeband	Fusion Maple
Metal Finish	Silver Sparkle
Lectern Style	Surround Worksurface
Worksurface/Power	Custom FT2-202 and additional Grommet
Worksurface Cutout	None
Split OB Cutout 1	None
Split OB Cutout 2	None
Instructor Right/Left	Left
Rack Options	14RU Rack Cabinet
Shelf	None
Keyboard	Keyboard Tray
Logo Panel	Custom Logo Panel w/Printed Backer

Laminate | Edgeband | Metal

Cut Out Details(1):	CC202/FT2-202
Cut Out Details(2):	Grommet 2”

Logo:	Repeat
Backer Color:	Printed Color Backer
Original Artwork	

All Logo Printed Backer Panels are Printed in CMYK Values (Colors may Vary - PMS Color Reference is requested)

BROWARD COLLEGE
C=100 M=58 Y=0 K=21
PANTONE 294 C

Conceptual Drawing

Other Notes:

1) F2T2-202 center and add 2” grommet to right of cutout
2) Use 0184326WH LOGO PRINTED BKR BROWARD COLLEGE 55418
3) Reference 0184324 LOGO PANEL ASSM BROWARD COLLEGE 55418
4)
5)

Internal Notes Only

06191 Print Ready Broward College

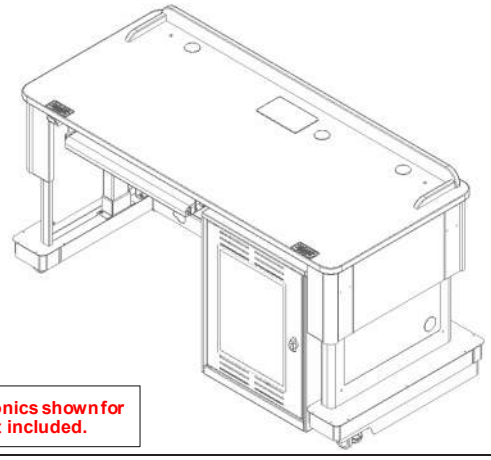
0208419 [UNIT ASSM CUSTOM 55418]
0184330 [LOGO PANEL BROWARD COLLEGE 55418]
0184326 [LOGO PRINTED BKR BROWARD COLLEGE 55418]

SPECTRUM INDUSTRIES INC.

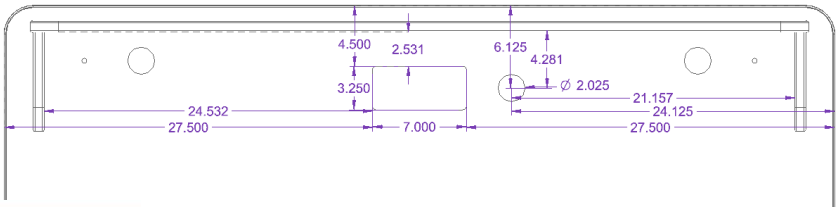
PO Box 400, Chippewa Falls, WI 54729
715-723-6750 | spectrumfurniture.com

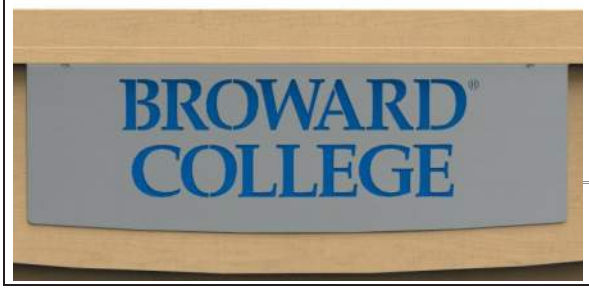
NON-STANDARD DETAIL SHEET

Item Number 55418-20227
Description Freedom XRS Srnd FT2-202 2" Grmt Broward College FMFMS



supplied electronics shown for
nly and are not included.





Customer to confirm cutout size(s) & location(s) are correct for installed electronics & components.

Customization requests are completed in Spectrum's ISO 9001:2015 facility, and Spectrum will save all full drawings and documentations for repeat orders from Buyer for a period of time following each order. Any customization designs that Spectrum creates or improves upon for Buyer remains or becomes the intellectual property of Spectrum, which Spectrum may use or further improve upon for future products at Spectrum's sole discretion. Orders shall not be cancelled or returned. All sales are final. In the event of order cancellation, Buyer shall be responsible for payment of cancellation charges in the amount of all costs, expense s and damages incurred by Spectrum, including labor required to process the cancellation and applicable shipping costs. Customized orders require a lead time of 6-12 weeks depending on the complexity of changes and production schedule at time of order.

Approved By: _____ **Date:** _____
(Signature)

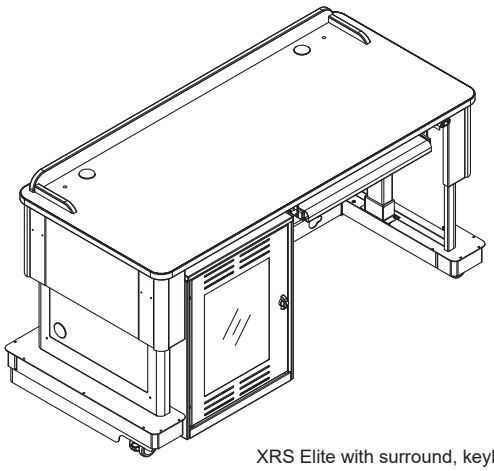
_____
(Print Name)

SPECTRUM INDUSTRIES INC.

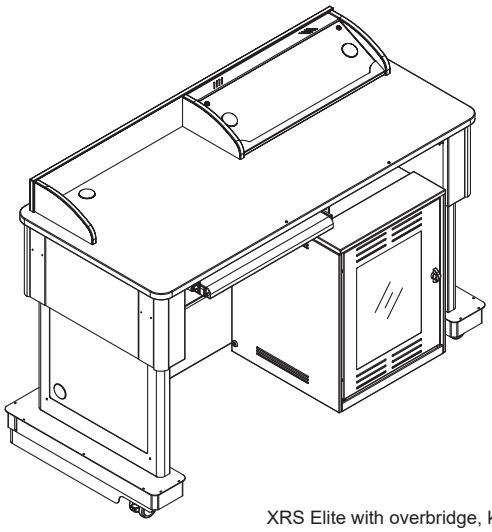
Freedom XRS Lectern™

Technical Specifications

55418



XRS Elite with surround, keyboard tray, and rack cabinet installed on left (shown retracted)



XRS Elite with overbridge, keyboard tray, and rack cabinet installed on right (shown extended)

Use the Freedom XRS Elite Lectern where worksurface height adjustment, ADA compliance, and rack rail equipment storage is required. Electric actuators provide worksurface height adjustment from 32"-40". The lectern is available with a surround, or an overbridge. Rack cabinet can be integrated with electronics off-site then docked under the left or the right side of the lectern when ready. Additional options like flip-up shelf, customized logo panel, worksurface power module, and keyboard tray are available.

ADA MEETS ADA STANDARDS

Features and Benefits

Lectern:

- Electric adjustable-height worksurface adjusts between varying seated or standing-use heights (32"-40"H)
- ADA-compliant
- Scratch and impact-resistant high-pressure laminate top provides a durable, useful worksurface
- Surround on worksurface provides privacy and styling
- Overbridge version with blank panel allows custom cutouts and installation of electronics (overbridge version only)
- Worksurface grommet holes and cable grommets throughout lectern provide cable access
- Pre-drilled monitor arm mounting holes allow installation of a monitor arm (2 on surround version, 1 on OB version)
- Wiring channel provides easy cable routing
- 3" swivel locking Twin-Wheel (TW) casters
- 2" grommet in each side panel provides cord access
- All internal wiring can be accessed from the instructor-side
- Cable grommets throughout and wiring channel provide cable access and wiring
- Kick panel and wiring channel protect cables during worksurface movement
- Replaceable base skirt panels hide casters (customer-installed)
- Removable locking audience-side panel
- Optional customizable logo panel simplifies adding or changing logos
- Optional pull-out worksurface / keyboard tray can be used as a keyboard tray or storage drawer
- Optional flip-up shelf provides a convenient additional worksurface (customer-installed)

Rack Cabinet:

- Rack-rail mounting (14RU front, 9RU rear) simplifies installation for any equipment configuration
- The cabinet allows rack-mount equipment to be installed remotely, then brought to the lectern-attaching under the left or right side of the lectern
- Casters under the cabinet provide easy repositioning for quick and easy access
- Keyed locking rack door provides security and easy-access
- Ventilated panels keep equipment cool
- Quick-release instructor side acrylic door provides monitoring of internal equipment, and can be removed to provide full access to rack equipment
- Symmetrical acrylic door can be attached to the left or right side of the cabinet

Misc:

- Durable powder coated steel chassis provides a long-lasting finish
- Warranted to be free of all defects in materials and workmanship for 10 years
- Designed and assembled in Chippewa Falls, WI, USA

Color Options

Available in Spectrum Expressions colors.
See **spectrumfurniture.com** for complete color information.

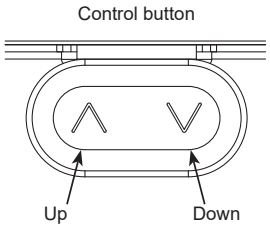
Ordering Instructions

Spectrum has designed this product to receive the useful options shown here. To ensure your options are ordered correctly please call 1-800-235-1262.

10/8/24

Construction

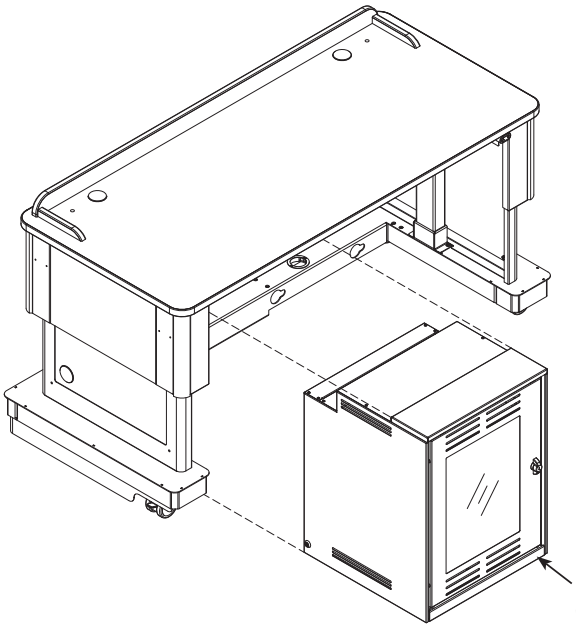
- The worksurface is constructed from 1" thick composite board with .030" high-pressure laminate on one face, and a balancing phenolic backer on the opposing face
- Metal components consist of 16-gauge steel
- Worksurface edges are covered with 3mm vinyl edgeband
- All metal components are finished with a scratch-resistant powder coat epoxy
- Solid wood corner trim
- Each Freedom XRS Elite Lectern ships assembled with casters on its own skid. Customer-installed base skirt and rack cabinet.



Specifications

Lectern worksurface height adjustablility (floor to top of worksurface)	40"H [101.6 cm] (fully-raised) 32"H [81.3 cm] (fully-lowered)	
Rack Cabinet (optional)	• Front rack rail: 14RU • Rear rack rail: 9RU • Available rack depth (nominal): 17"D [43.19 cm] • Locking door can be flipped to be hinged left or right	• Vented panels provide equipment cooling • Open back provides access • One rack cabinet can be attached to the left or right side of the lectern
3" Twin Wheel casters	Weight capacity 165 lb [74.9 kg] each	
ADA-compliance*	Knee clearance: 30"W [76.17 cm] x 22"D [55.8 cm] x 29"H [73.7 cm] (1 person per lectern)	Note: Worksurface with keyboards must be raised to provide ADA clearance **Minimum ADA guidelines for knee clearances are 30"W [76.2 cm] x 19"D [48.3 cm] x 27"H [68.6 cm]*
Electrical	• Range of motion: 8" [20.3 cm] • ~10 seconds from fully-lowered to fully-raised • Inverter: 120V @ 60Hz, max output 300 watts • Motors: 18V / 10 amps • Typical electrical load during operation: 4.3 amps @ 120 VAC • Anti-collision protection	• 11' [335 cm] nominal 3-wire power cord • Max load: 800N (180 lb) [82 kg] per actuator total lift capacity: 360 lb [163 kg] • Actuators feature non-hydraulic, permanently lubricated screw jacks • Actuators rated for 20,000 cycles • Approved according to EN 60335-1 and UL 962
Unit weights (nominal)	295 lb [134 kg] - Lectern (without rack cabinet)	
Shipping weights (nominal)	361 lb [164 kg] - 445 lb [202 kg] (depends on configuration)	

Specifications subject to change without notice

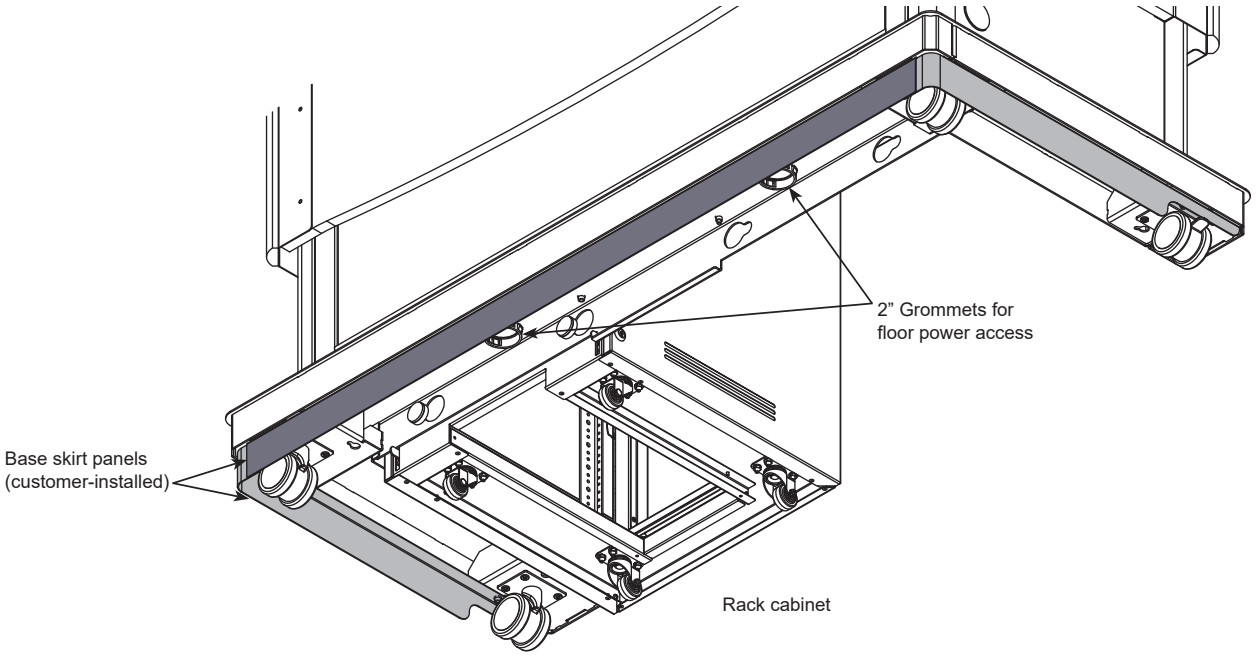


Note: The Freedom XRS Elite Lectern is not designed for use with cord reels or surface-mount cord reel accessories.

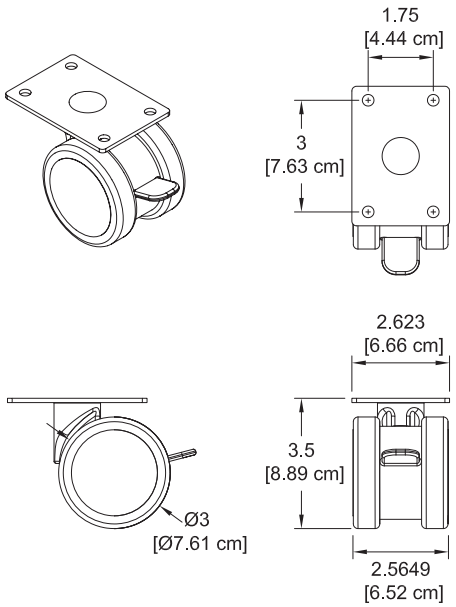
Note: CPU slings cannot be used with Freedom XRS Elite lecterns because of mounting and ADA-compliance considerations. If a CPU is necessary, it can and should be installed into the rack cabinet using a rack-mount shelf. See website for rack-mount accessories.

Use caution when raising or lowering lectern!

Bottom view



3” Twin-Wheel caster
(TW)

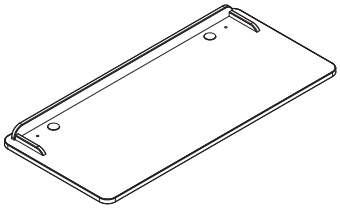


APPROVED CLASSROOM PODIUM - FIXED

Lectern Style

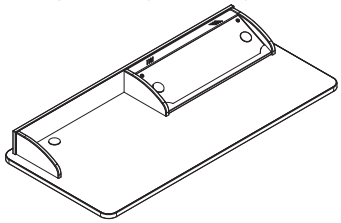
ORDER CODE S1 =	Surround

- Surround
- Two 2” grommets (with covers)
- Two .375” holes (with plugs) for worksurface monitor arm mounting



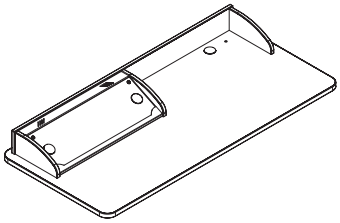
ORDER CODE B2 =	Overbridge Right

- Overbridge with blank insert panel for custom cutouts (see p.13 for dimensions). (Overbridge not available separately)
- Two 2” grommets (with covers)



ORDER CODE B3 =	Overbridge Left

- Overbridge with blank insert panel for custom cutouts (see p.13 for dimensions). (Overbridge not available separately)
- Two 2” grommets (with covers)



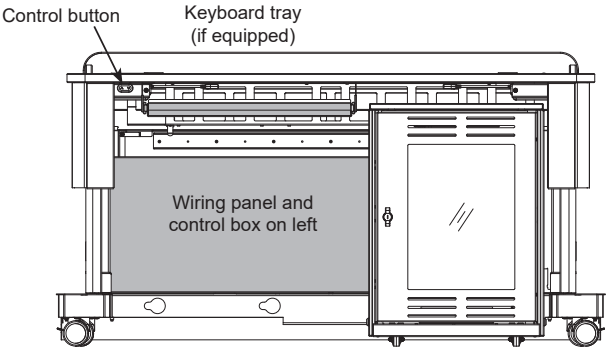
Instruction Orientation

ORDER CODE L =	Left instructor

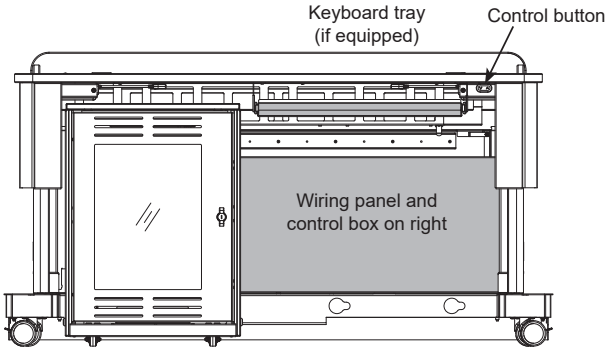
Note: The keyboard tray, wiring panel, control box, and control button always stay together on the same side as shown.

ORDER CODE R =	Right instructor

Instructor this side



Instructor this side



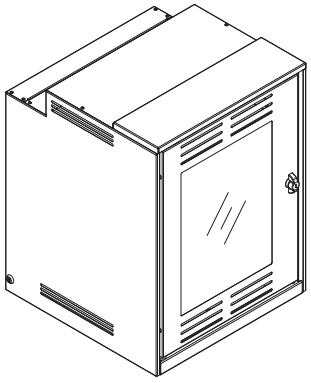
Rack Cabinet

ORDER CODE 0 =	None
ORDER CODE 3 =	Yes

Rack Cabinet

- One rack cabinet attaches to the left or right side of the XRS Elite Lectern (opposite keyboard tray and wiring panel)
- Locking door can be flipped to be hinged left or right
- Locking side hatches
- Open back
- Acrylic panel in door
- Casters under the cabinet provide easy repositioning for quick and easy access (not intended for long-range transport).
- Customer-installed

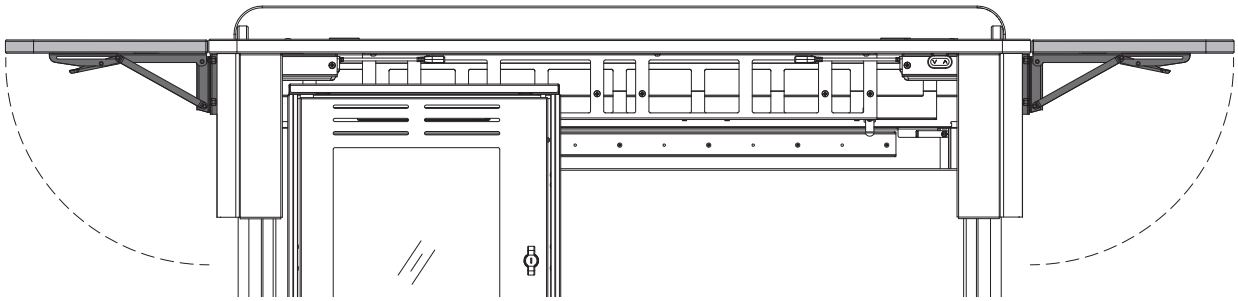
Front rack rail:	14RU
Rear rack rail:	9RU
Dimensions:	21.1”W [53.5 cm] x 21.7”D [55.1 cm] x 28.5”H [72.4 cm]
Unit weight:	55 lb [25 kg]



Note: If rack rail mounting is needed in the lectern, the rack cabinet must be specified. The lectern does not provide any rack-mount capabilities without the cabinet.

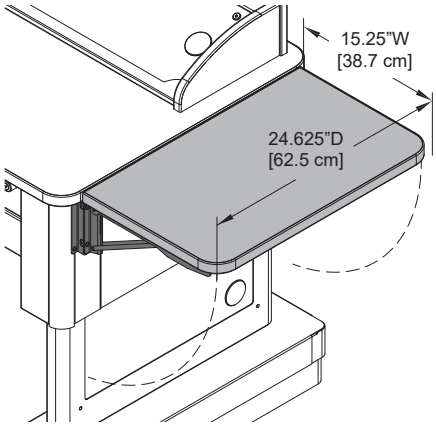
Flip-Up Shelf (Customer-installed)

ORDER CODE 0 =	None
ORDER CODE C =	One shelf, Matching laminate
ORDER CODE D =	Two shelves, Matching laminate
ORDER CODE E =	One shelf, Chalk white dry erase (WD)
ORDER CODE F =	Two shelves, Chalk white dry erase (WD)



- Shelf hinges lock into place in the upright position
- Shelf installed level with worksurface
- Available in matching, or White Chalk Dry Erase laminate. (Flip-up shelves configured with white laminate will have the same edgeband color as the worksurface.)
- Shelf is customer-installed

Weight capacity: 35 lb [15.9 kg]
Dimensions: 15.25"W [38.7 cm] x 24.625"D [62.5 cm] x 1"H [2.54 cm]

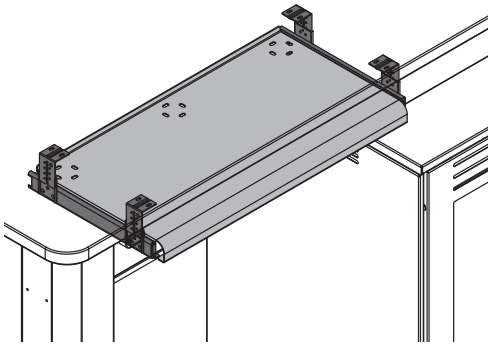


Keyboard Tray Option

ORDER CODE 0 =	None
ORDER CODE 1 =	Yes

Pull-out Keyboard Tray

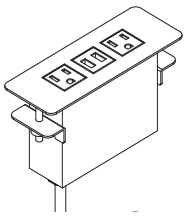
- Installed in left or right position (opposite rack cabinet) using pre-drilled holes
- Tray can be installed and used as a keyboard tray or flipped and used as a storage drawer using pre-drilled mounting holes under the worksurface.
- Wire management slots in tray
- Max 1 tray per Freedom XRS Elite
- 24"W [61 cm] x 11.625"D [29.5 cm] x 2.43"H [6.1 cm]
- 16 ga steel
- Unit weight: 8 lb [3.6 kg]
- Shipping weight: 10 lb [4.5 kg]

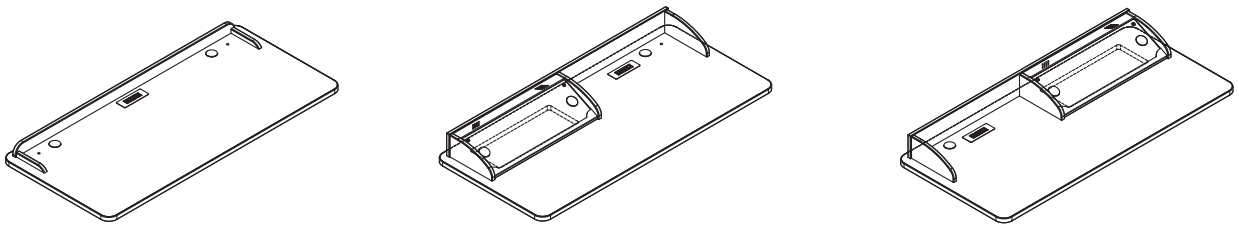


Installed Power Equipment

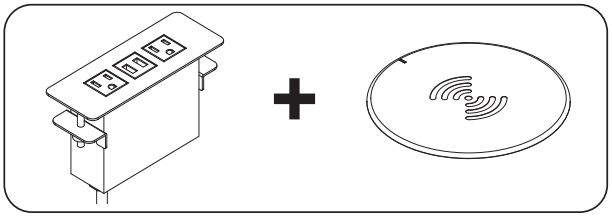
ORDER CODE 0 = None

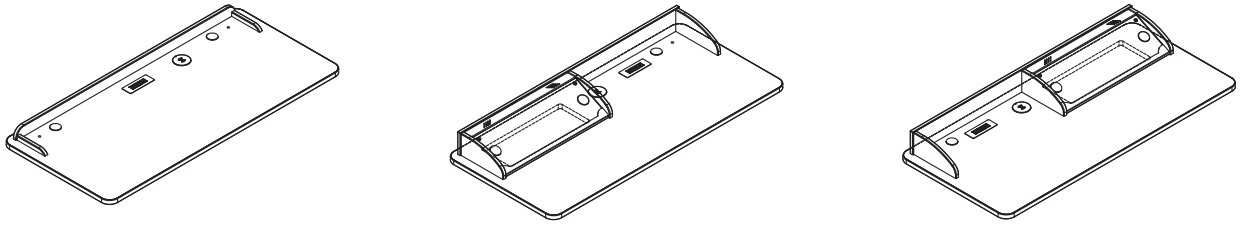
ORDER CODE 1 = Power Module



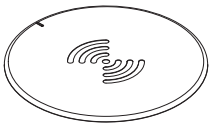


ORDER CODE 2 = Power Module - EM Wireless Charging Pad

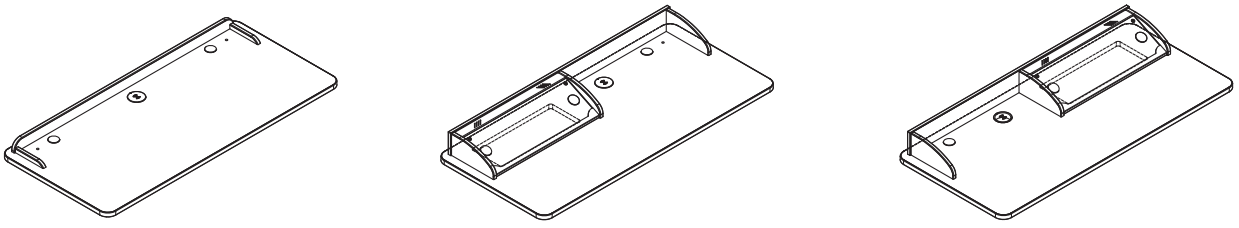




ORDER CODE 3 = EM Wireless Charging Pad



- Uses electromagnetic technology to charge Qi V1.2 compliant IC devices (“Qi enabled)
- LED to confirm pairing / charging
- Security tab prevents theft
- Includes 3” round cutout
- UL-certified

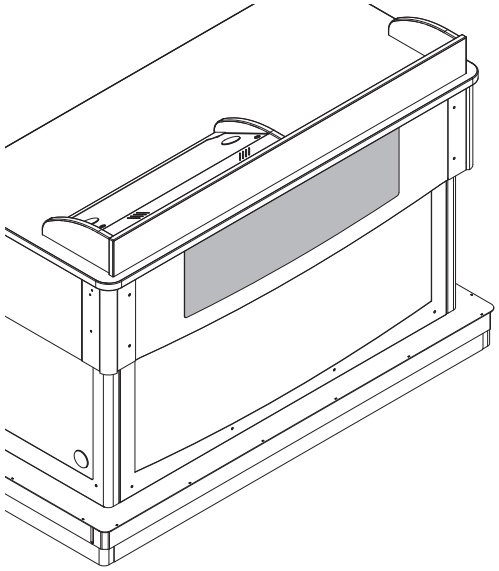


Custom Logo Panel

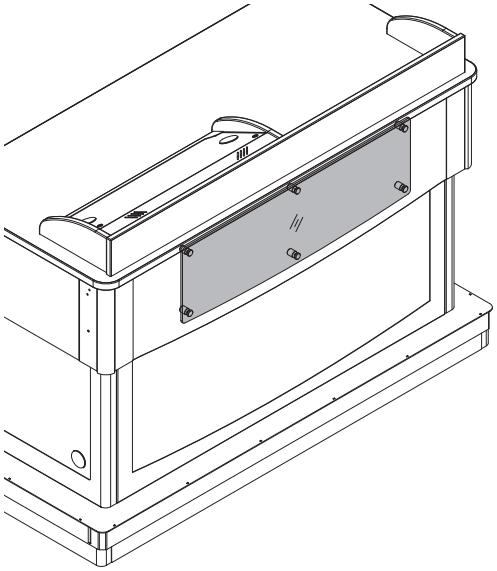
ORDER CODE 0 =	None
ORDER CODE 1 =	Yes (with matching laminate backer)
ORDER CODE 3 =	Yes (with black laminate backer)
ORDER CODE 4 =	Yes (with white laminate backer)
ORDER CODE 5 =	Yes-with printed backer

ORDER CODE 6 =	Acryilic logo panel

Customized Metal Logo Panel



Customized Acrylic Logo Panel



See p.13-14 for more information on logo panels

Power Module Color

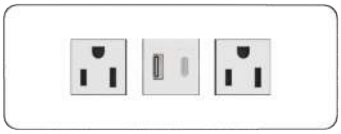
ORDER CODE 0 = None

- Factory-installed
- (2) AC receptacles (tamper-resistant)
- (1) USB charge port
- (1) USB-C charge port
- Aluminum housing and flange
- 10' 14AWG *3C power cord
- When specified, the Power Module is centered on the audience-side edge of the worksurface
- Worksurface cutout size: 5.65"W x 1.65"D
- Available in black, silver, or white
- ETL-certified

ORDER CODE B = Black

ORDER CODE S = Silver

ORDER CODE W = White

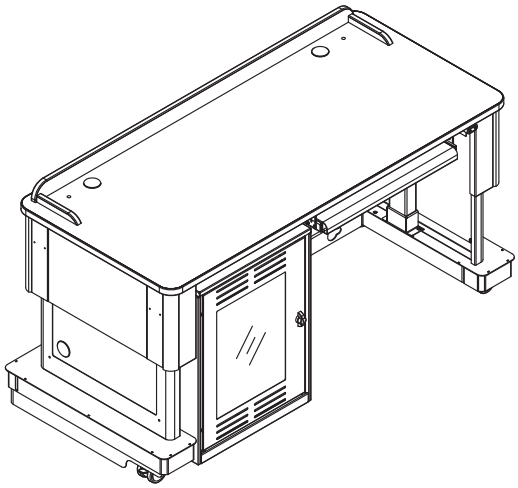


Custom Cutouts

ORDER CODE 0 =	None
ORDER CODE 2 =	Yes - in Worksurface
ORDER CODE 3 =	Yes - in OB Panel
ORDER CODE 4 =	Yes - in Worksurface and OB Panel

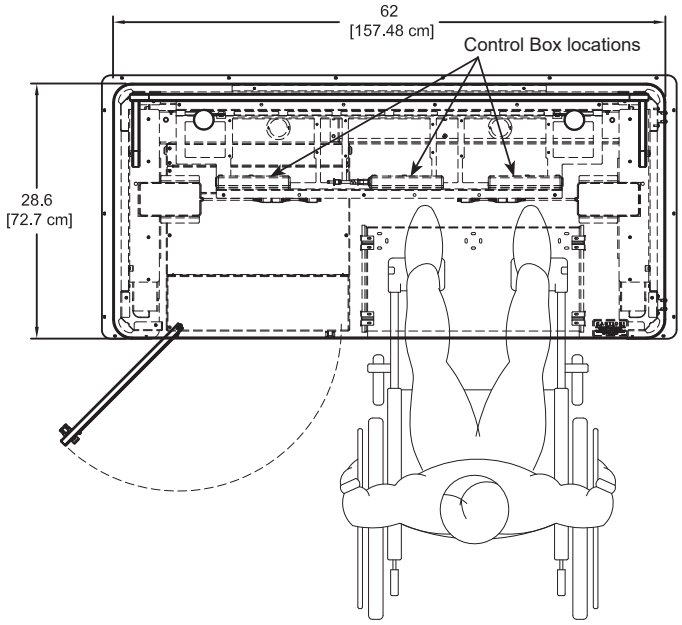
Contact Spectrum with device(s) / cutout(s) and preferred locations.

APPROVED CLASSROOM PODIUM - FIXED



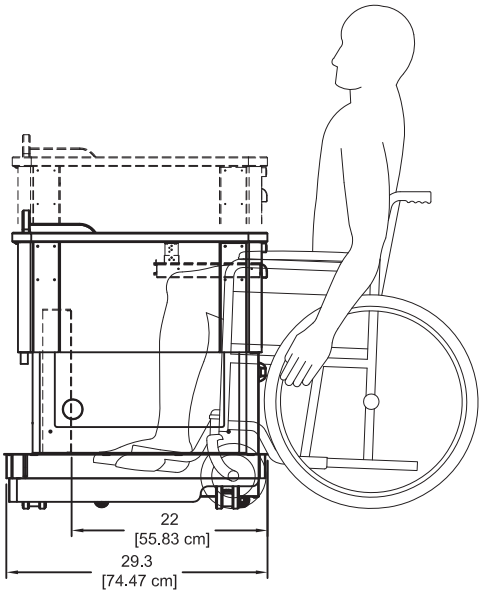
Freedom XRS Elite Lectern with surround

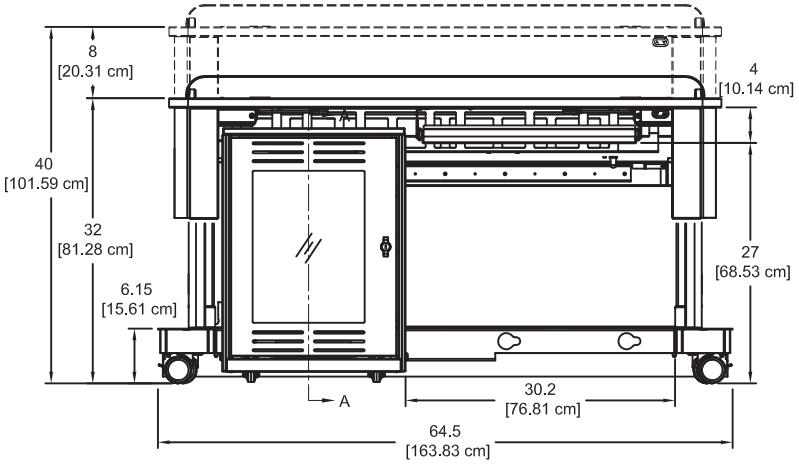
(shown with rack cabinet on left,
keyboard tray on right)



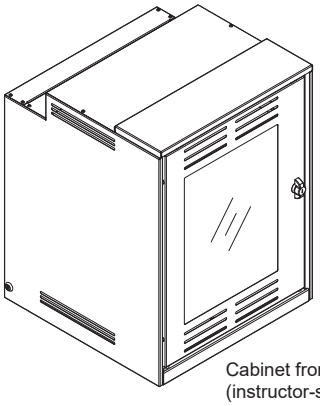
Note: Modified worksurface or overbridge insert panel cutouts should be reviewed by Spectrum to ensure clearance of brackets, keyboard slides, or other objects under the worksurface.

Note: The wiring channel has three sets of control box mounting holes-left, center, and right. If necessary, the control box can be relocated to provide space for installed components.

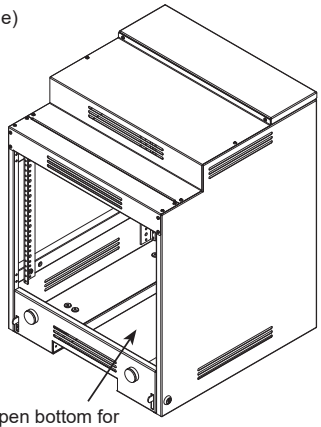




Freedom XRS Elite Rack Cabinet



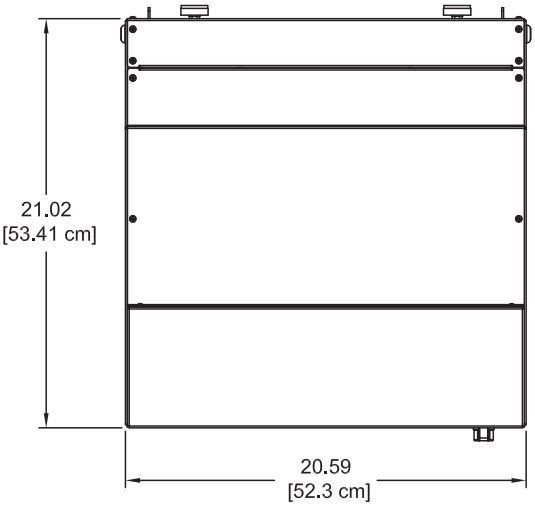
Cabinet front
(instructor-side)

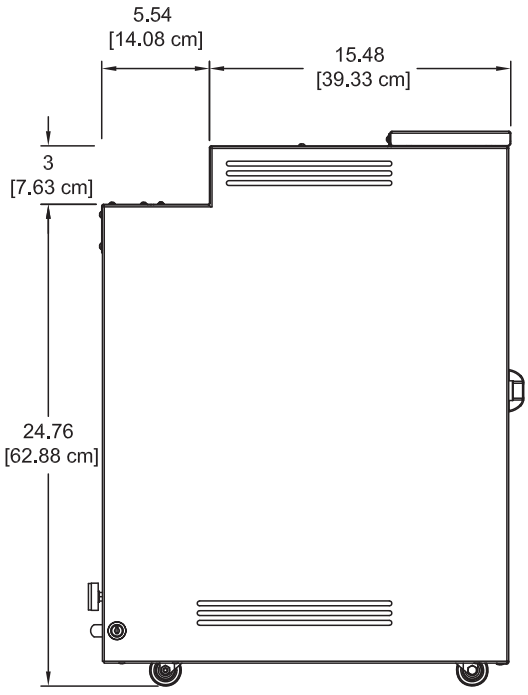


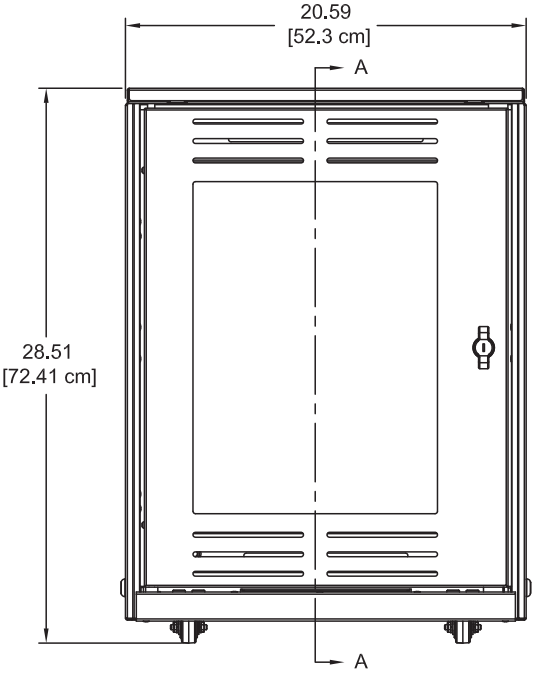
Cabinet rear
(open-back)

Open bottom for
floor box access

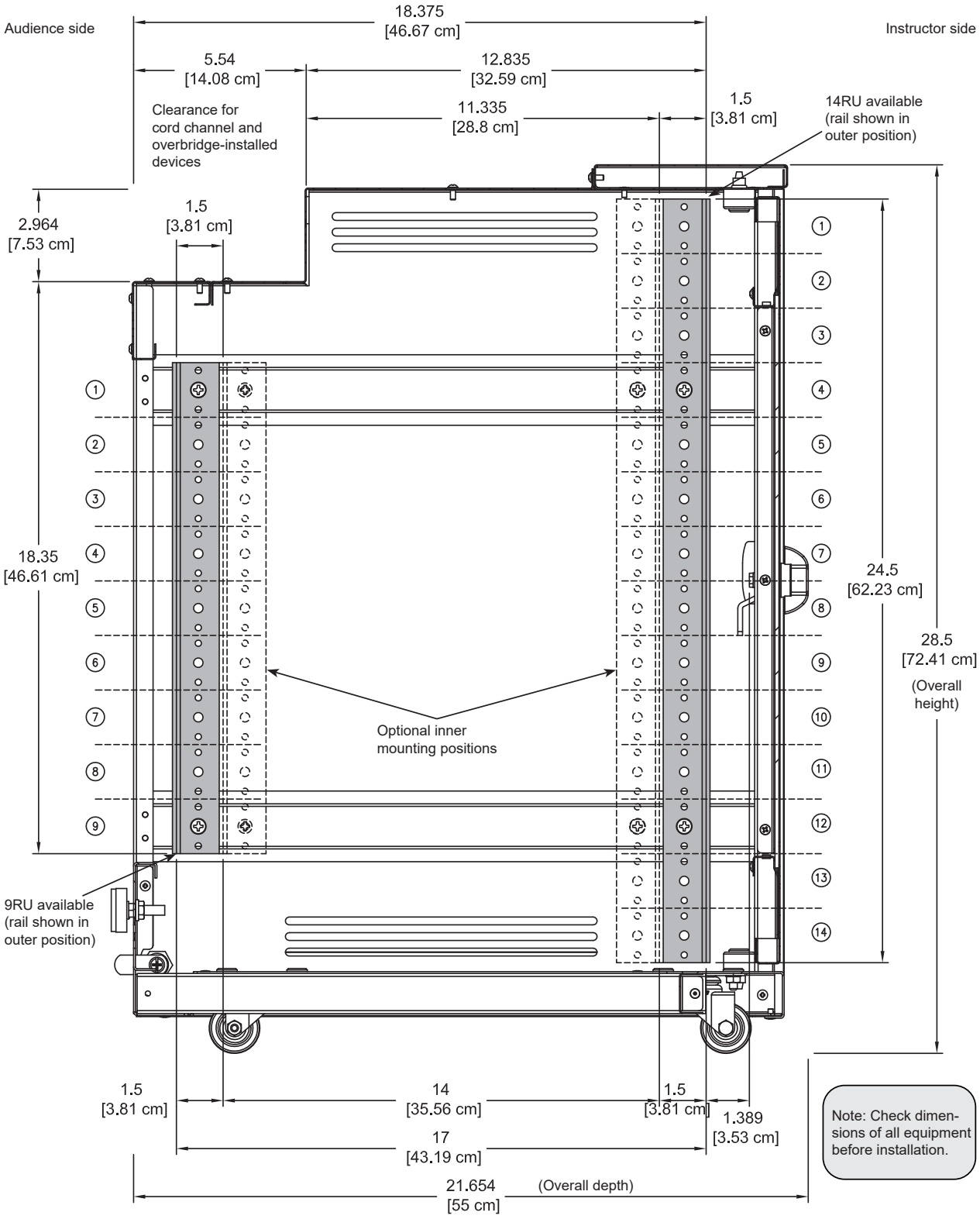
Note: Casters under cabinet provide easy repositioning for quick and easy access.



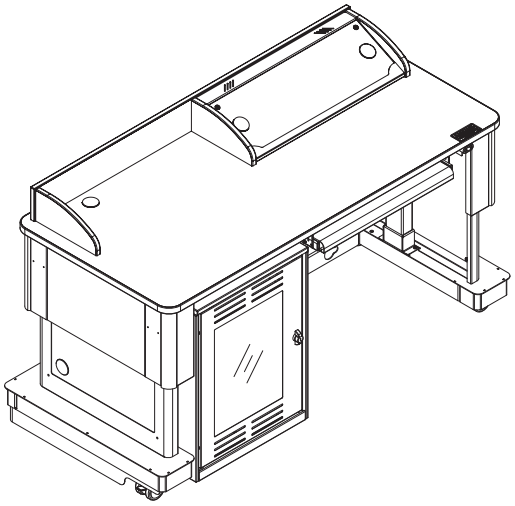




Rack Cabinet
Section view A-A

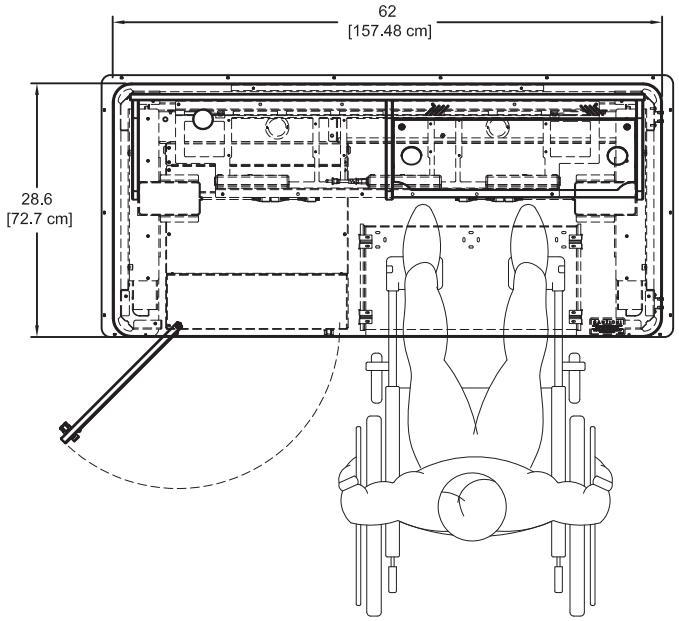


APPROVED CLASSROOM PODIUM - FIXED



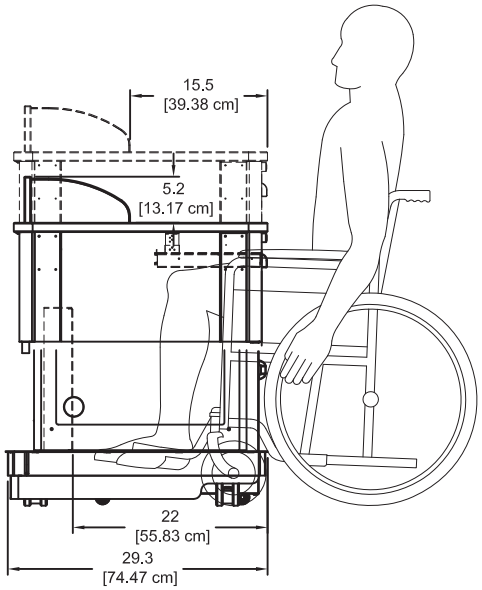
Freedom XRS Elite Lectern with Overbridge

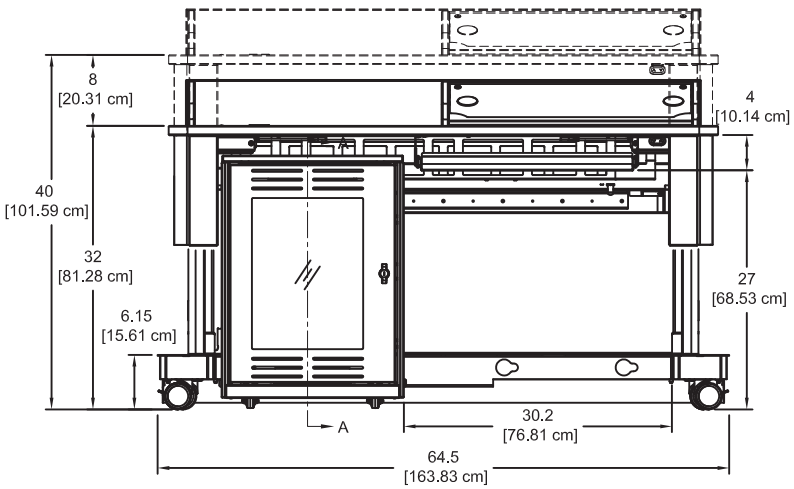
(shown with rack cabinet on left,
keyboard tray on right)



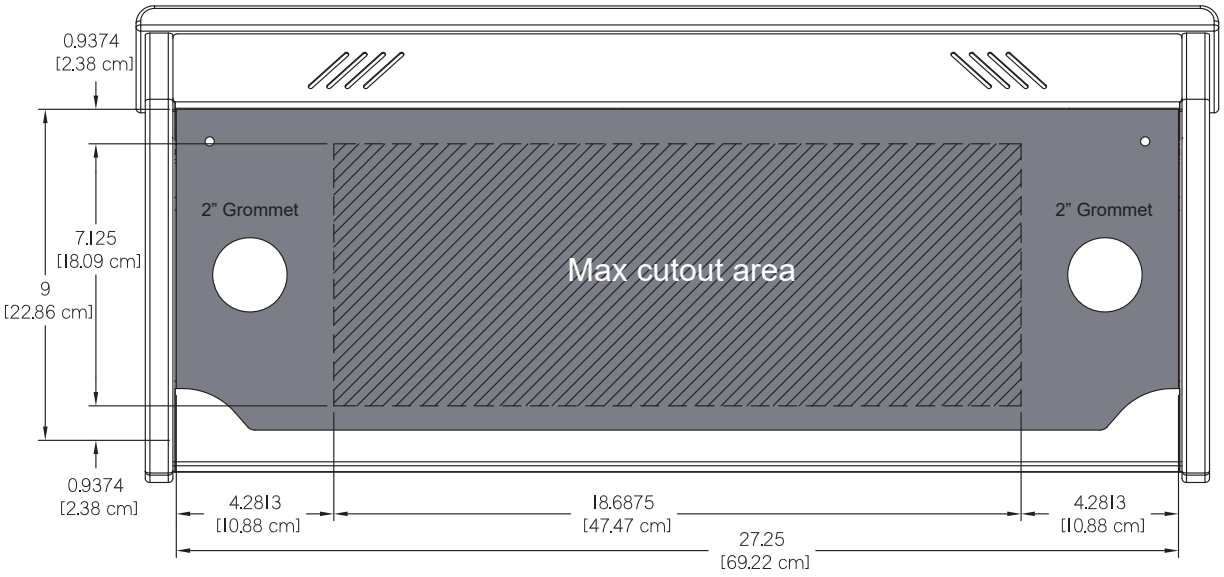
Note: Modified worksurface or overbridge insert panel cutouts should be reviewed by Spectrum to ensure clearance of brackets, keyboard slides, or other objects under the worksurface.

Note: The wiring channel has three sets of control box mounting holes-left, center, and right. If necessary, the control box can be relocated to provide space for installed components.

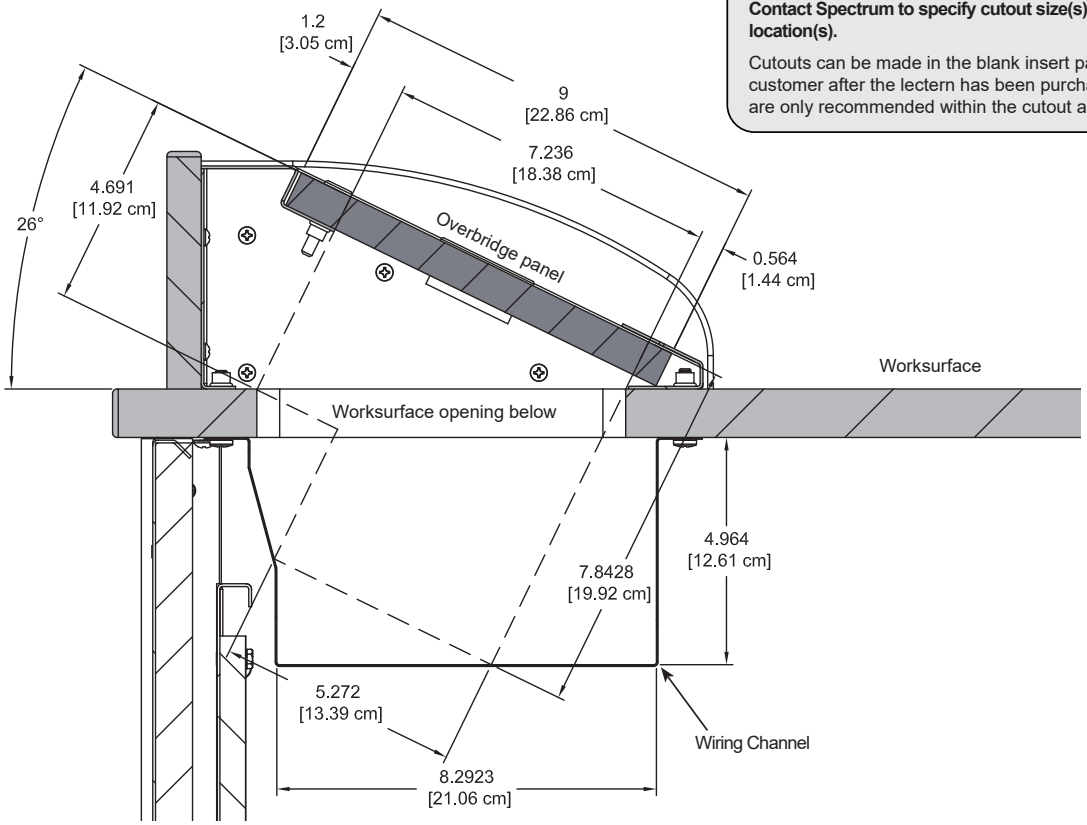




Freedom XRS Elite Lectern Overbridge Insert Panel Blank
(flat view)



Overbridge
Section view B-B

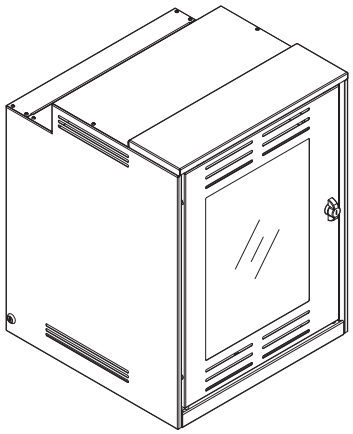


Note: The Overbridge Control Console™ has been designed for many of the currently available controllers on the market, however, modified cutouts should be reviewed by Spectrum to ensure clearance of brackets, keyboard slides, or other objects under the worksurface.

Contact Spectrum to specify cutout size(s) and location(s).

Cutouts can be made in the blank insert panel by the customer after the lectern has been purchased, but are only recommended within the cutout area shown.

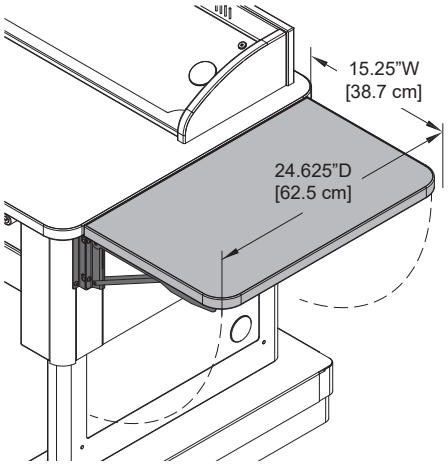
Accessories



Rack Cabinet - 55419

- One rack cabinet attaches to the left or right side of the XRS Elite Lectern (opposite keyboard tray and wiring panel)
- Locking door can be flipped to be hinged left or right
- Open back
- Acrylic panel in door
- Vented panels provide equipment cooling
- Casters under the cabinet provide easy repositioning for quick and easy access (not intended for long-range transport).
- Customer-installed

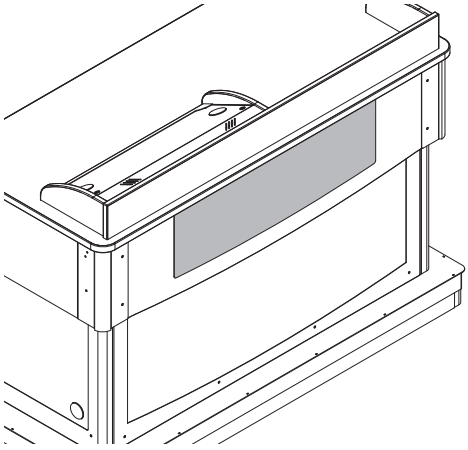
Front rack rail:	14RU
Rear rack rail:	9RU
Dimensions:	21.1”W [53.5 cm] x 21.7”D [55.1 cm] x 28.5”H [72.4 cm]
Shipping weight:	55 lb [25 kg]



Flip-up Shelf - 55533

- Shelf hinges lock into place in the upright position
- Shelf installs level with worksurface
- Mounts on left or right
- Available in matching, or White Chalk Dry Erase laminate

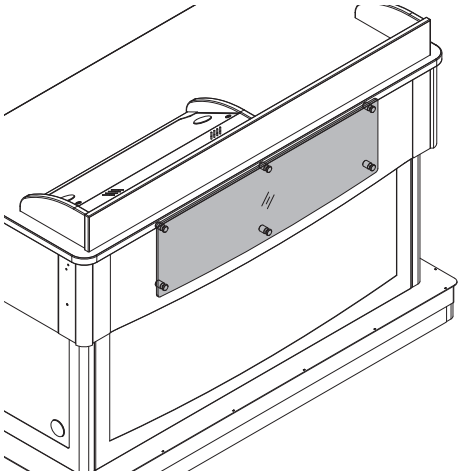
Dimensions:	15.25”W [38.7 cm] x 24.625”D [62.5 cm] x 1”H [2.54 cm]
Weight capacity:	35 lb [15.9 kg]
Shipping weight:	20 lb [9.1 kg]



Customized Metal Logo Panel - 55389

- Attaches to audience-side of lectern
- To get panel customized-contact Spectrum for details
- New logos require a first-time logo charge

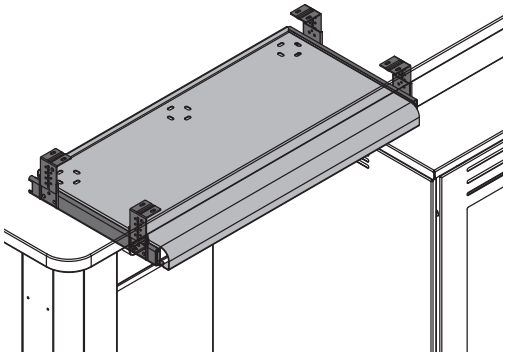
Dimensions:	35.25”W [89.53 cm] x 9”H [22.86 cm]
Available logo area:	35”W [88.91 cm] x 9”H [22.86 cm]



Customized Acrylic Logo Panel - 55389

- Attaches with standoffs to audience-side of lectern
- Clear acrylic mounted on standoffs
- New logos require a first time logo charge
- Customer-installed
- To get panel customized-contact Spectrum for details

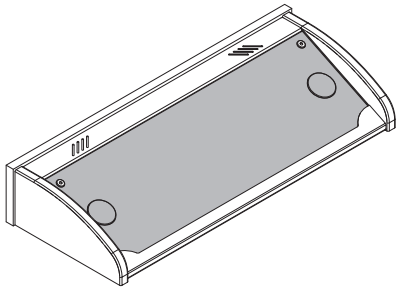
Dimensions:	32.25“W [72.6 cm] x 10.78”H [27.4 cm]
Unit weight:	3.92 lb [1.8 kg]
Shipping weight:	4.92 lb [2.2 kg]



Pull-out Keyboard Tray - 55496

- Installed in left or right position (opposite rack cabinet) using pre-drilled holes
- Tray can be installed and used as a keyboard tray or flipped and used as a storage drawer using pre-drilled mounting holes under the worksurface.
- Wire management slots in tray
- Max 1 tray per Freedom XRS Elite
- 24”W [61 cm] x 11.625”D [29.5 cm] x 2.43”H [6.1 cm]
- 16 ga steel
- Unit weight: 8 lb [3.6 kg]
- Shipping weight: 10 lb [4.5 kg]

Note: The keyboard tray protrudes 3.9” [10 cm] below the worksurface. If the lectern is used for ADA use, a higher adjusted worksurface is necessary to provide ADA leg clearance.

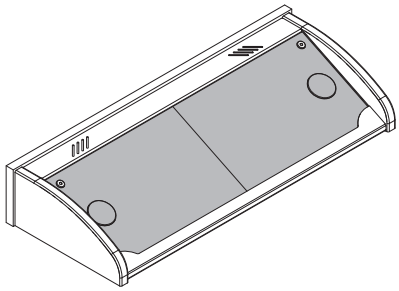


Overbridge Insert Panel-Medium - 96504

- Panel for overbridge version only (overbridge not available separately)
- Contact Spectrum to specify cutout size(s) and position(s)
- Includes two 2” [5.08 cm] grommets with covers
- Customer-installed

Dimensions:	27.25”W [69.2 cm] x 9”D [22.9 cm] x .79”H [2 cm]
Unit weight:	N/A
Shipping weight:	8.5 lb [3.9 kg]

Insert panels are available to customers needing a replacement panel or different cutouts for technology upgrades.

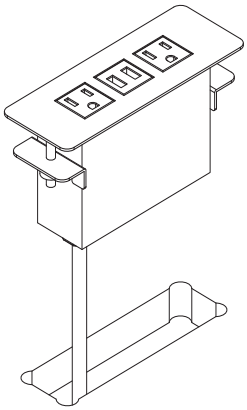


Two-piece Overbridge Insert Panel-Medium - 96512

- Split panel for overbridge version only
- Contact Spectrum to specify cutout size(s) and position(s)
- Includes 2” [5.08 cm] grommets with covers
- Customer-installed

Dimensions:	13.625”W [34.6 cm] x 9”D [22.86 cm] x .79”H [2 cm]
Unit weight:	N/A
Shipping weight:	4.25 lb [1.9 kg]

APPROVED CLASSROOM PODIUM - FIXED



USB-C Power Module - 99075

- (2) AC power outlets (tamper-resistant)
- (1) USB charge port
- (1) USB-C charge port
- Aluminum housing and flange
- Thumbscrew clamps
- ETL-certified
- Available in black, silver, or white
- Customer-installed

Cutout required:	5.65”W x 1.65”D cutout exists under flip-up lid
Power cord:	10’ [305 cm] 14AWG *3C power cord
Power receptacles:	125V, 60hz, 15A tamper-resistant
USB-C charging port:	2.4A (12W) (non data compatible)
USB charging port:	2.1A (10.5W) (non data compatible)
Dimensions:	6.38”W [16.2 cm] x 2.36”D [6 cm] x 3.54”H [9 cm]
Unit weight:	2 lb [.9 kg]
Shipping weight:	2.35 lb [1 kg]

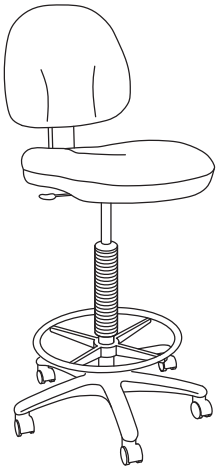
EM Wireless Charging Pad - 99057

- Uses electromagnetic technology to charge Qi V1.2 compliant IC devices ("Qi" enabled)
- LED to confirm pairing / charging
- Security tab prevents theft
- Requires 3” round cutout to be made by customer
- UL-certified

Note: The unit requires a 7” diameter of clearance to work with Qi-enabled phones placed in any orientation. The 3” dia cutout should be located on the worksurface at least 3.5” from any edge.

7-Outlet Power Strip - 99024

- Electrical Rating: AC 125V, 15 Amps
- 1000 Joules surge capacity
- 12’ cord length
- LED switch
- UL Listed
- Shipping weight: 1.9 lb [.86 kg]

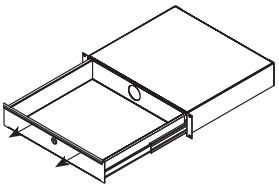


Adjustable Drafting Stool - 38202

- 40-52” height-adjustment via pneumatic cylinder
- 360° swivel
- Tilting backrest
- 18” diameter fixed foot ring
- 5-star base

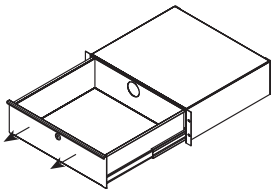
See **spectrumfurniture.com** for complete details on Spectrum’s full line of monitor arms.

Rack-mount Accessories



Locking Drawer - 2RU - 97527

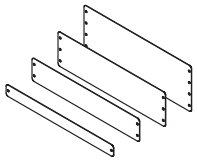
- 16ga steel
- Drawer: 15.97"W [40.56 cm] x 14.56"D [36.98 cm] x 3"H [7.63 cm]
- Weight capacity: 50 lb [22.7 kg]
- Shipping weight: 15.85 lb [7.2 kg]



Locking Drawer - 3RU - 97526

- 16ga steel
- Drawer: 15.97"W [40.56 cm] x 14.56"D [36.98 cm] x 5.25"H [13.33 cm]
- Weight capacity: 50 lb [22.7 kg]
- Shipping weight: 18.5 lb [8.4 kg]

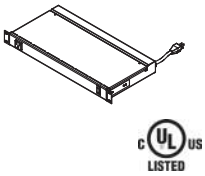
Note: The rack-mount pull-out drawers are only compatible when the rack cabinet door is removed.



Rack-Mount Blanks

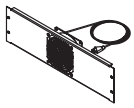
1RU - 97510 **3RU - 97512**
2RU - 97511 **4RU - 97513**

- Fills rack spaces where components are not needed
- 16 ga steel
- Shipping weight: <1 lb [.45 kg]



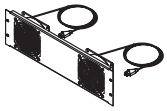
9-Outlet Power Strip - 1RU - 99021

- 8 outlets rear (breaker-protected)
- 1 convenience outlet front
- 115VAC, 60 Hz, 15 amps max
- 9' power cord
- Front LED power switch
- Enhanced surge protection
- ETL-listed, UL-listed
- 19"W [48.27 cm] x 9.25"D [23.5 cm] x 1.74"H [4.41 cm]
- Shipping weight: 8.7 lb [3.9 kg]



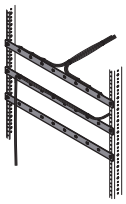
Single Fan - 3RU - 97507

- 50 cfm
- 120V~50/60 Hz, 15/13W
- RoHS
- 19"W [48.27 cm] x 1.56"D [3.97 cm] x 5.25"H [13.33 cm]
- Shipping weight: 3.78 lb [1.7 kg]



Double Fan - 3RU - 97506

- 100 cfm
- 120V~50/60 Hz, 15/13W
- RoHS
- 19"W [48.27 cm] x 1.56"D [3.97 cm] x 5.25"H [13.33 cm]
- Shipping weight: 5.47 lb [2.5 kg]



Wire Lace Kit - 95517

- Provides wire management
- Mounts to standard rack rails
- Includes (3) lace straps and mounting screws
- Includes (12) 5.5" zip ties
- Shipping weight: 1.25 lb [.57 kg]

See **spectrumfurniture.com** for the latest accessories and detailed warranty information.

Warranty

We will make it right for you!

Thanks for choosing Spectrum! Spectrum is committed to provide complete customer satisfaction. Each of our products is manufactured from the best materials available and each product is stringently monitored throughout the production process through our P.A.C.E. program (Product Assurance to meet Customer Expectations).

We expressly warrant that Spectrum products will be of good quality and workmanship and free from defect for the period set out in the warranty from the date of delivery.

For a listing of all product specific warranty terms please visit our website at:

https://www.spectrumfurniture.com/en/resources/purchasing-terms-warranty

1-800-235-1262
Toll-free HELPLINE
spectrum@spectrumfurniture.com

SPECTRUM INDUSTRIES INC.

PO Box 400, Chippewa Falls, WI 54729
715-723-6750 | spectrumfurniture.com

NON-STANDARD DETAIL SHEET

Product Type	Custom	Phantom	☐		DGW
Item Number	55597-20012			Item Reference	55597-HRSNSS2041051 / 24203-20002
Description	Freedom Pro Srrnd,60"CSTR Rt Rack, Broward College,CC202,HRSNS				

Laminate	High Rise
Edgeband	Silver Northsea
Metal Finish	Silver Sparkle
Worksurface	Surround Worksurface Custom FT2-202 Centered
Power Option	None
Keyboard Tray	None
Logo Option	Custom Logo Printed Backer Broward College
Cabinet/Rack Option	Cabinet Right w/ Rack Cube
Door Option	Acrylic
Base Option	Casters

Laminate | Edgeband | Metal

Cut Out Details(1):	CC202/FT2-202
Cut Out Details(2):	N/A

Logo:	Repeat
Backer Color:	Printed Color Backer
Original Artwork	

All Logo Printed Backer Panels are Printed in CMYK Values (Colors may Vary - PMS Color Reference is requested)

Conceptual Drawing

Customer Supplied Electronics Shown for Reference Only and are not Included

Other Notes:

1) FT2-202 centered
2) Reference Specifications for 24203-20002 - to be updated to new standard 55597 version (Note: Rack Cube included)
3) Use 0203859WH LOGO PRINTED BKR BROWARD COLLEGE 24203
4) Ref. 0203849 PANEL REAR BROWARD COLLEGE
5)

Internal Notes Only

Quote Number: Q-000281545

24203-20002 R1.docx

FT2-202	0208369 [WORKSURFACE ASSM FT 202 CUSTOM]	1	P0
Broward College**06191 Print Ready*			
	0208366 [FREEDOM PRO 55597 CUSTOM]	1	P0

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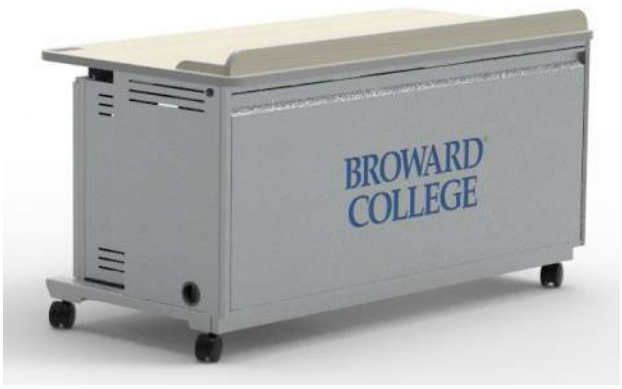
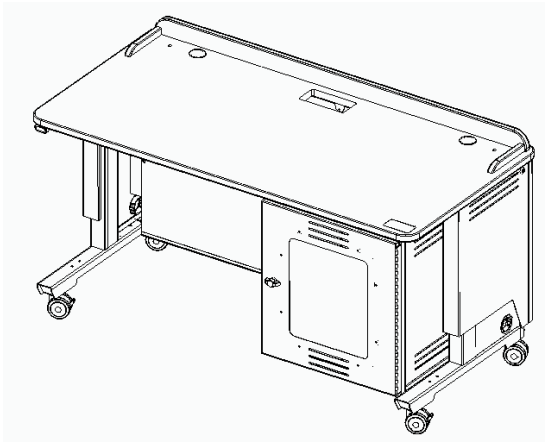
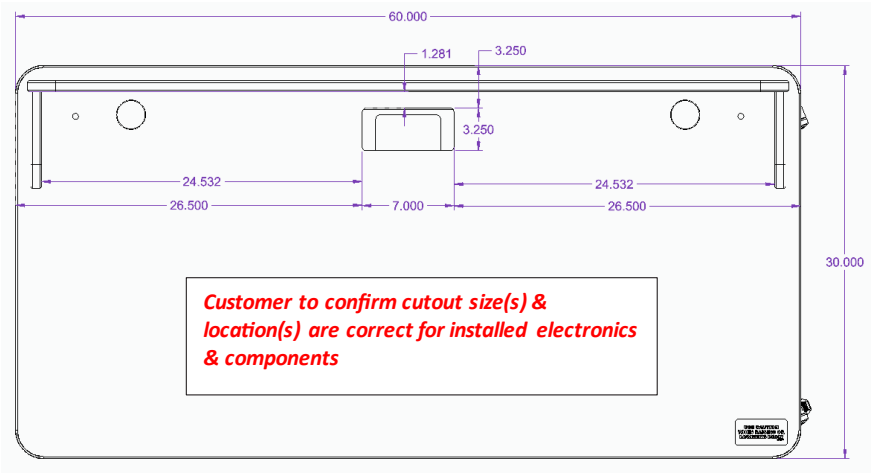
NON-STANDARD DETAIL SHEET

Item Number 55597-20012
Description Freedom Pro Srrnd,60"CSTR Rt Rack, Broward College,CC202,HRSNS







Customization requests are completed in Spectrum's ISO 9001:2015 facility, and Spectrum will save all full drawings and documentations for repeat orders from Buyer for a period of time following each order. Any customization designs that Spectrum creates or improves upon for Buyer remains or becomes the intellectual property of Spectrum, which Spectrum may use or further improve upon for future products at Spectrum's sole discretion. Orders shall not be cancelled or returned. All sales are final. In the event of order cancellation, Buyer shall be responsible for payment of cancellation charges in the amount of all costs, expense s and damages incurred by Spectrum, including labor required to process the cancellation and applicable shipping costs. Customized orders require a lead time of 6-12 weeks depending on the complexity of changes and production schedule at time of order.

Approved By: _____ **Date:** _____
(Signature)

_____
(Print Name)

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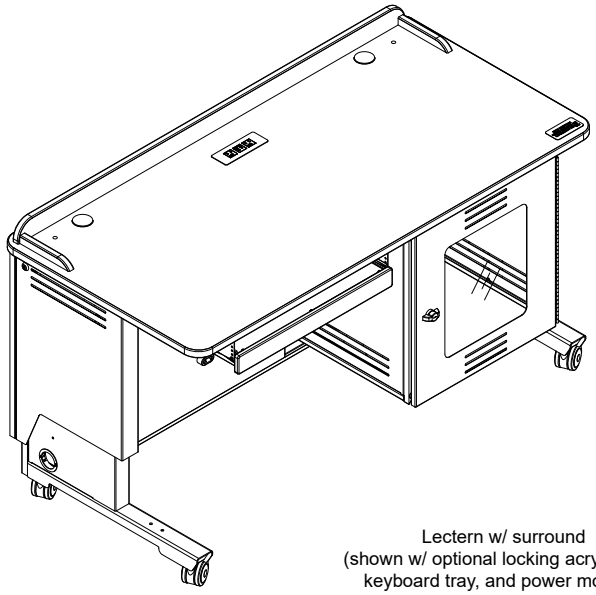
SPECTRUM INDUSTRIES INC.

Freedom Pro Lectern™

Technical Specifications

55597



Lectern w/ surround
(shown w/ optional locking acrylic door, keyboard tray, and power module)

Use the Freedom One Pro Lectern where worksurface height adjustment, ADA compliance, and rack rail equipment storage is required. Electric actuators provide 12" of vertical worksurface adjustability and the lectern is available with a plain, or surround worksurface. The optional onboard cabinet can be configured on the left or right-hand side of the lectern along with rack rail mounting. Additional available accessories allow you to outfit your lectern to a specific environment.

ADA MEETS ADA STANDARDS

Features and Benefits

- Electric eLift adjustable-height worksurface easily adjusts between varying seated or standing-use heights
- ADA-compliant
- 60"W x 30"D worksurface provides a large work area
- Worksurface grommet holes provide superior cord access
- Surround on worksurface provides privacy and styling (surround version)
- Pre-drilled monitor arm mounting holes allow easy installation of a monitor arm
- Cable grommets throughout lectern provide cable access
- Removable audience-side panel provides easy access and security
- Casters or glides factory-assembled
- Full-length modesty panel (worksurface to casters)
- Kick panel and wire loom protect cables during worksurface movement
- Optional onboard cabinet can be configured for left or right-hand use
- Optional 12RU rack cube provides equipment rack mounting
- Optional locking cabinet doors provide security
- Optional tray can be used as a keyboard tray or storage drawer
- Optional customizable audience-side logo panel options provide institution branding
- 3" Swivel locking Twin-Wheel stem casters provide easy rolling
- Optional stationary glides available if mobility is not necessary or desired
- Scratch and impact-resistant high-pressure laminate provides a durable worksurface
- Durable powder coated steel chassis provides a long-lasting finish
- Warranted to be free of all defects in materials and workmanship for 10 years
- Designed and assembled in Chippewa Falls, WI, USA

Color Options

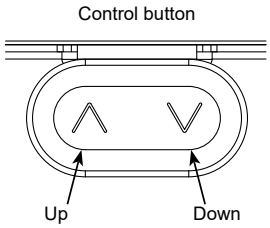
Available in Spectrum Expressions colors.
See **spectrumfurniture.com** for complete color information.

Ordering Instructions

Spectrum has designed this product to receive the useful options shown here. To ensure your options are ordered correctly please call 1-800-235-1262.

Construction

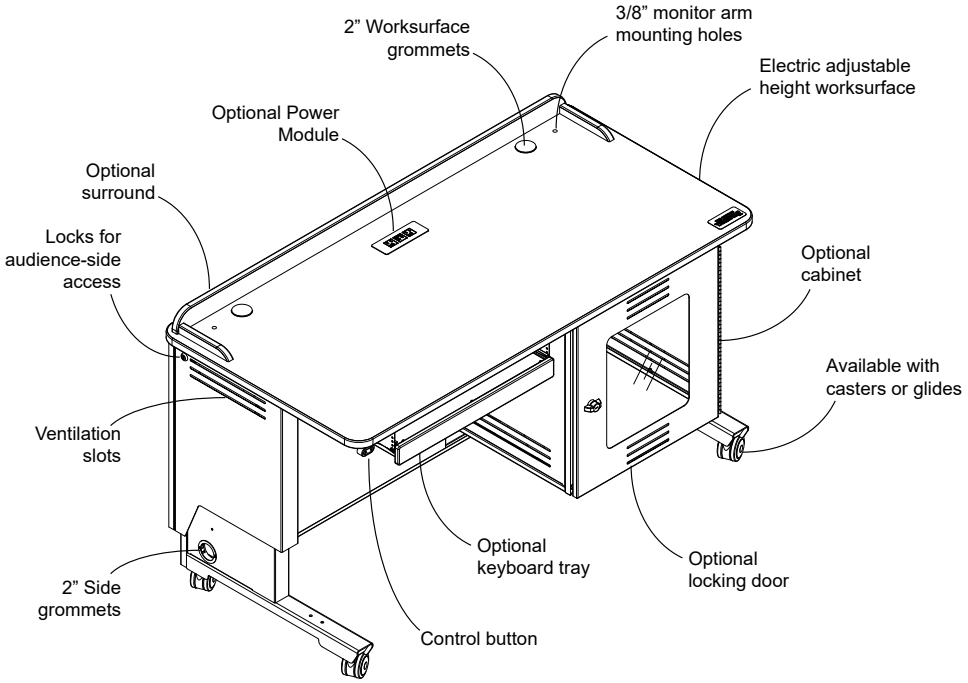
- The worksurface is constructed from 1" thick composite board with high-pressure laminate on one face, and a balancing phenolic backer on the opposing face
- Metal components consist of 16 and 20 gauge steel
- Worksurface edges are covered with 3mm vinyl
- All metal components are finished with a scratch-resistant powder coat epoxy
- Each Freedom Pro Lectern ships fully-assembled.



Specifications

Dimensions	60"W [152 cm] x 30"D [76.2 cm]	
Worksurface height adjustability (floor to top of worksurface)	42.125"H [107 cm] (fully-raised) 30.125"H [76.5 cm] (fully-lowered)	
Lectern electrical	• Range of motion: 12" [30.5 cm] • ~9.7 seconds from fully-lowered to fully-raised • Inverter: 120V @ 60Hz, max output 400 watts • Motors: 18V / 10 amps • Typical electrical load during operation: 4.3 amps @ 120 VAC • Anti-collision protection for safety • 11' [335 cm] nominal 3-wire power cord	• Casters / glides factory-assembled • Max load: 800N (180 lb) [81.7 kg] per actuator total lift capacity: 360 lb [163 kg] • Actuators feature non-hydraulic, permanently lubricated screw jacks • Actuators rated for 20,000 cycles • Tested at 1000 cycles at 300 lb • Approved according to EN 60335-1 and UL 962
Cabinet dimensions (without rack cube)	19.875"W [50.5 cm] x 17.5"D [44.5 cm] x .4278"H [54.4 cm]	
3" Twin Wheel casters	• Weight capacity 165 lb [74.9 kg] each • 1/2-13 threaded stem • 4 on equipment rack, 4 on lectern	
ADA-compliance* **Minimum ADA guidelines for knee clearances are 30"W [76.2 cm] x 19"D [48.3 cm] x 27"H [68.6 cm]*	• Knee clearance no cabinet: 53.75"W [136.5 cm] x • Knee clearance with cabinet: 31.87"W [81 cm] x	21.5"D [64.61 cm] x 29.8" [75.7 cm] - 41.8"H [106.2 cm]
	1 person per lectern	
Certifications / Compliance	Meets or exceeds applicable ANSI-BIFMA testing standards	
Unit weight (nominal)	234 lb [106 kg]	
Shipping weight (nominal)	259 lb [118 kg]	

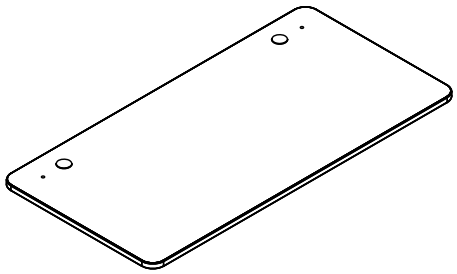
Specifications subject to change without notice



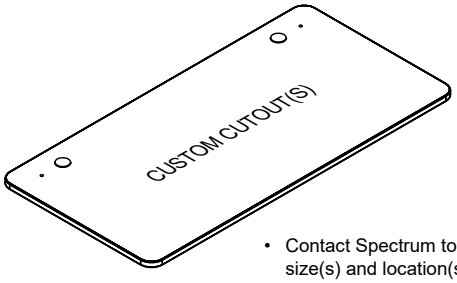
APPROVED CLASSROOM PODIUM - MOVEABLE

Lectern Style

ORDER CODE P1 = Plain worksurface

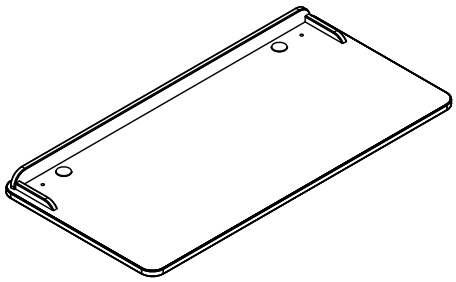


ORDER CODE P2 = Plain worksurface w/ custom cutout(s)

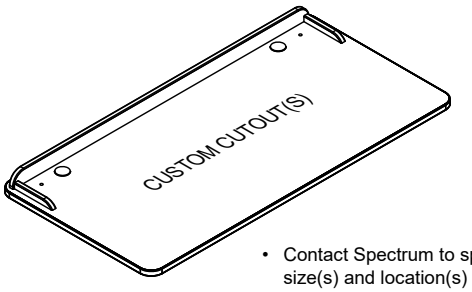


- Contact Spectrum to specify cutout size(s) and location(s) on worksurface
- See p.10 for location recommendations

ORDER CODE S1 = Surround worksurface



ORDER CODE S2 = Surround worksurface w/ custom cutout(s)

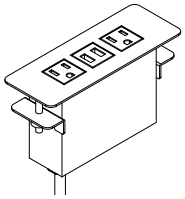


- Contact Spectrum to specify cutout size(s) and location(s) on worksurface
- See p.10 for location recommendations

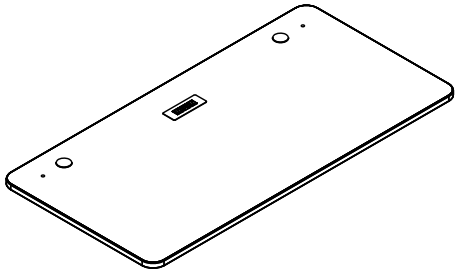
Power Options

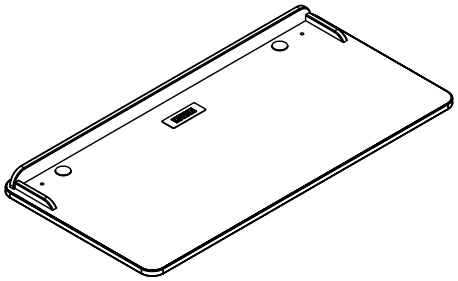
ORDER CODE 0 = None

ORDER CODE 1 = Power Module - Black
ORDER CODE 2 = Power Module - Silver
ORDER CODE 3 = Power Module - White



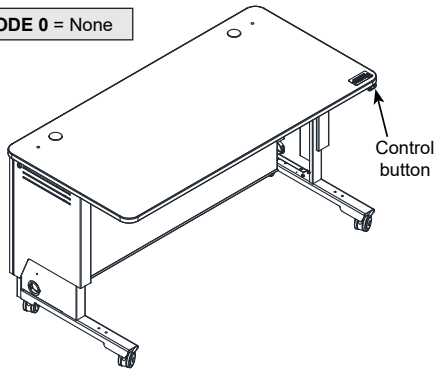
See p.12 for more power module information



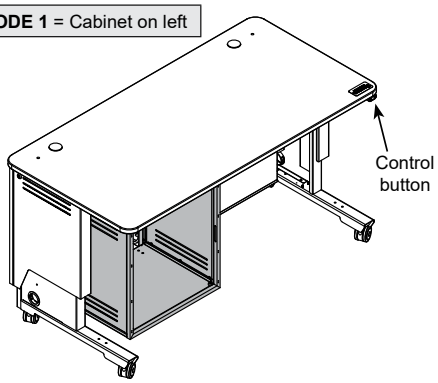


Cabinet / Rack Cube

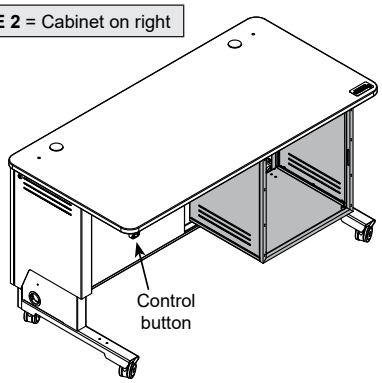
ORDER CODE 0 = None



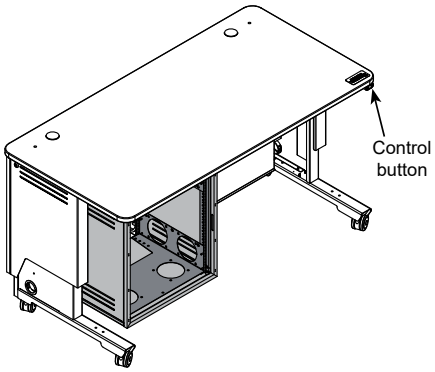
ORDER CODE 1 = Cabinet on left



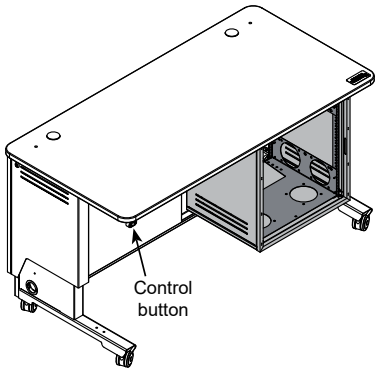
ORDER CODE 2 = Cabinet on right



ORDER CODE 3 = Cabinet on left w/ 12RU rack cube installed

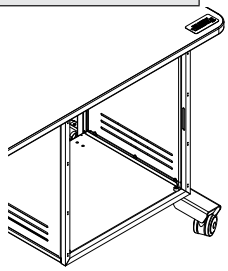


ORDER CODE 4 = Cabinet on right w/ 12RU rack cube installed

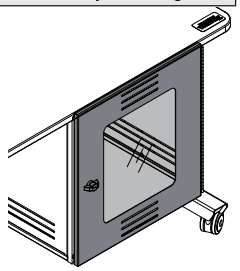


Cabinet Door

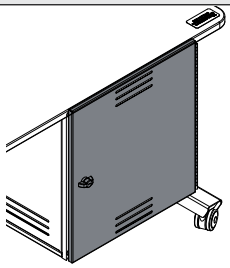
ORDER CODE 0 = None



ORDER CODE 1 = Acrylic locking door



ORDER CODE 2 = Solid locking door

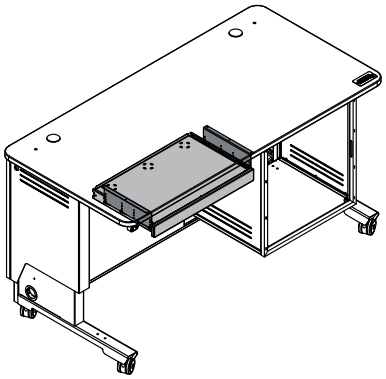


- Door on right cabinet will be hinged from right-side
- Door on left cabinet will be hinged from left-side
- Doors are symmetrical and can be flipped to be hinged from left or right

Keyboard Tray

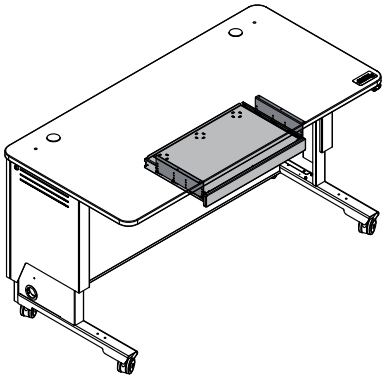
ORDER CODE 0 = None

ORDER CODE 1 = Left

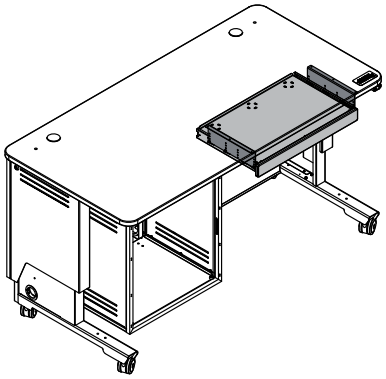


ORDER CODE 2 = Center

⚠ Note: The center keyboard location only works on lecterns without a cabinet.

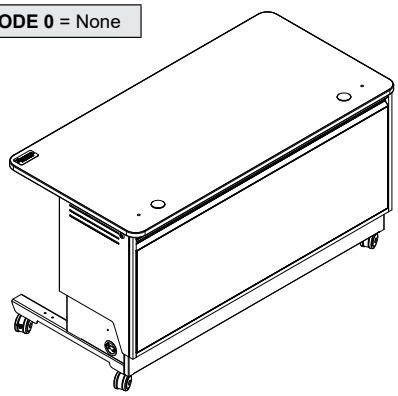


ORDER CODE 3 = Right



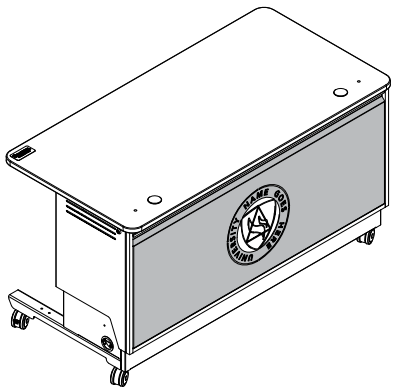
Customized Logo Panel

ORDER CODE 0 = None



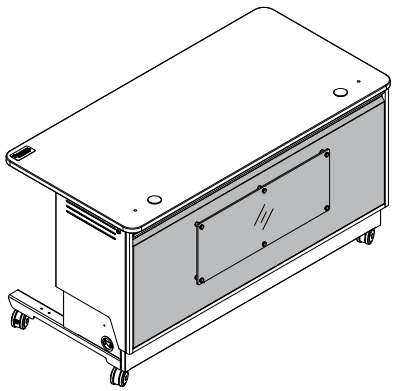
Customized Metal Logo Panel

ORDER CODE 1 =	Logo panel w/ matching laminate backer
ORDER CODE 3 =	Logo panel w/ black laminate backer
ORDER CODE 4 =	Logo panel w/ white laminate backer
ORDER CODE 5 =	Logo panel w/ custom printed backer



Customized Acrylic Logo Panel

ORDER CODE 6 =	Acrylic logo panel



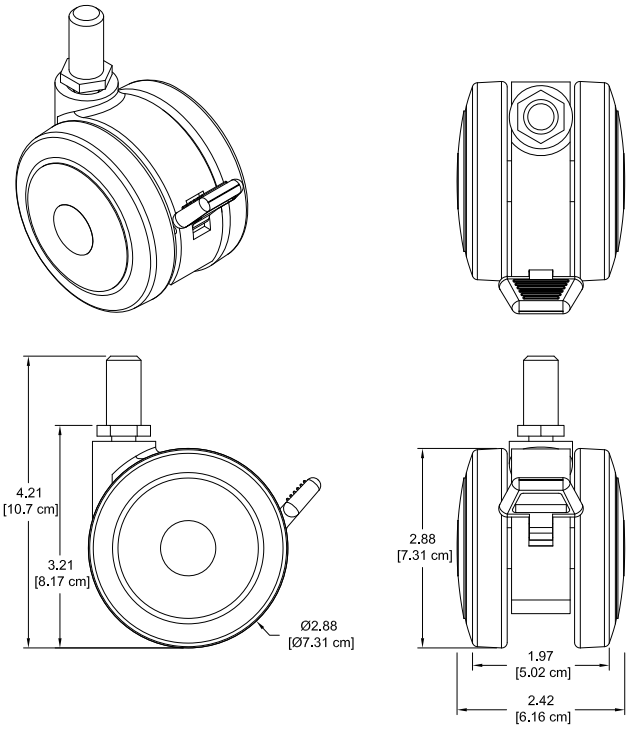
⚠
- Customized logo panel is factory-installed
- See p.12 for more logo panel information

APPROVED CLASSROOM PODIUM - MOVEABLE

Mobility

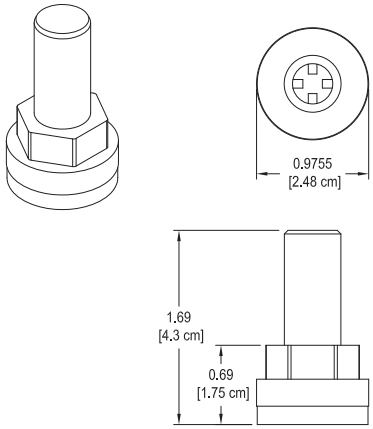
ORDER CODE 1 = 3" Twin-wheel casters

- For mobile use
- 3.21"H [8.15 cm]
- 1/2-13 threaded stem
- Black, soft thermoplastic
- Factory installed on Lectern
- Customer installed on Equipment Rack



ORDER CODE 2 = Glides

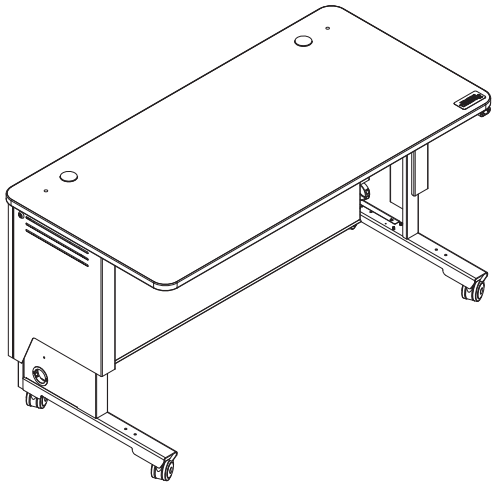
- For stationary use
- .69"H [1.75 cm]
- 1/2-13 threaded stem
- Black high-impact plastic
- Factory installed on Lectern
- Customer installed on Equipment Rack

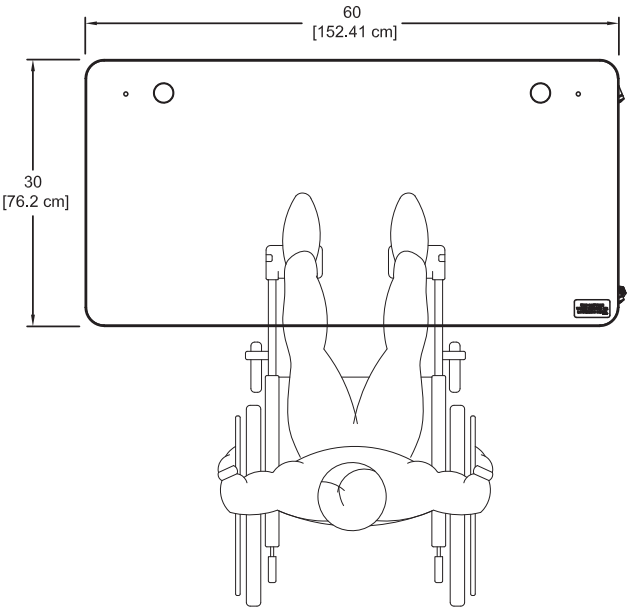


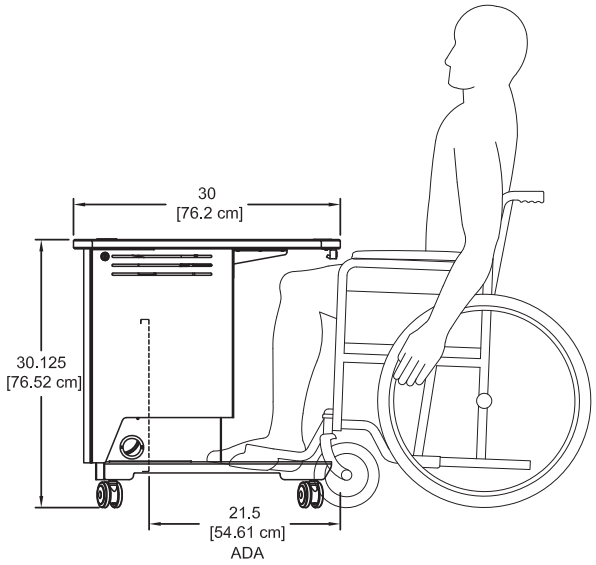
Note: If the lectern or equipment rack is ordered with glides, the overall height is lowered by 2.52" [6.4 cm]. Using glides does not affect ADA-compliance of the lectern.

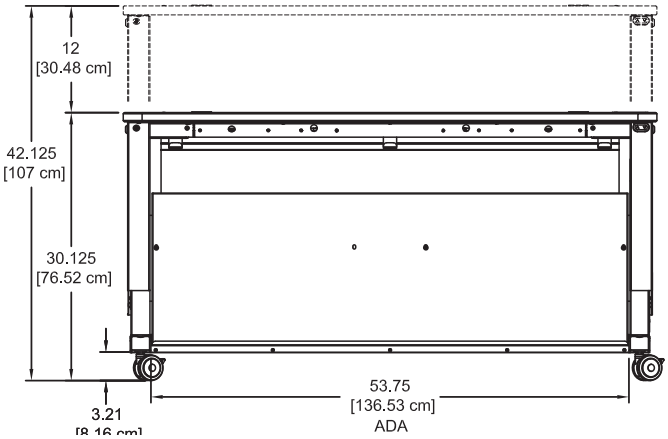
APPROVED CLASSROOM PODIUM - MOVEABLE

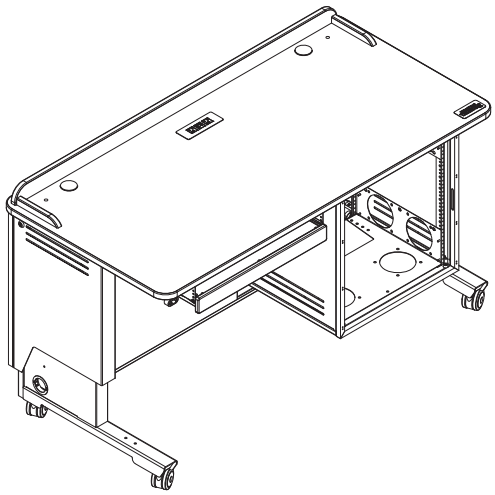
Freedom Pro Lectern





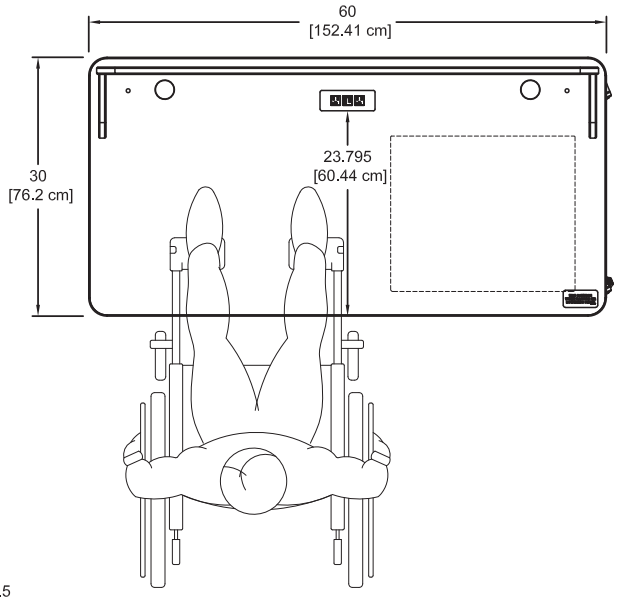


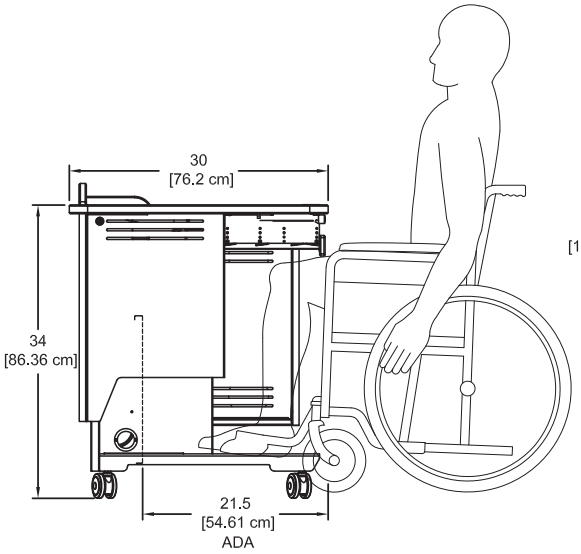


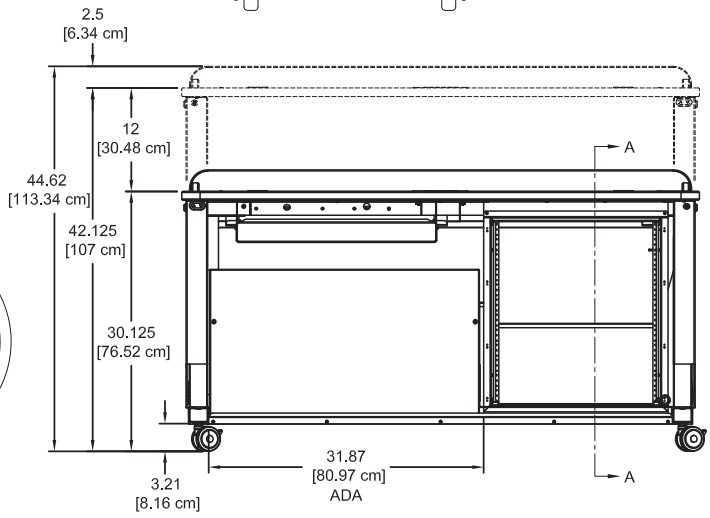


Freedom Pro Lectern

(shown with surround, power module, cabinet, rack cube, and keyboard tray)

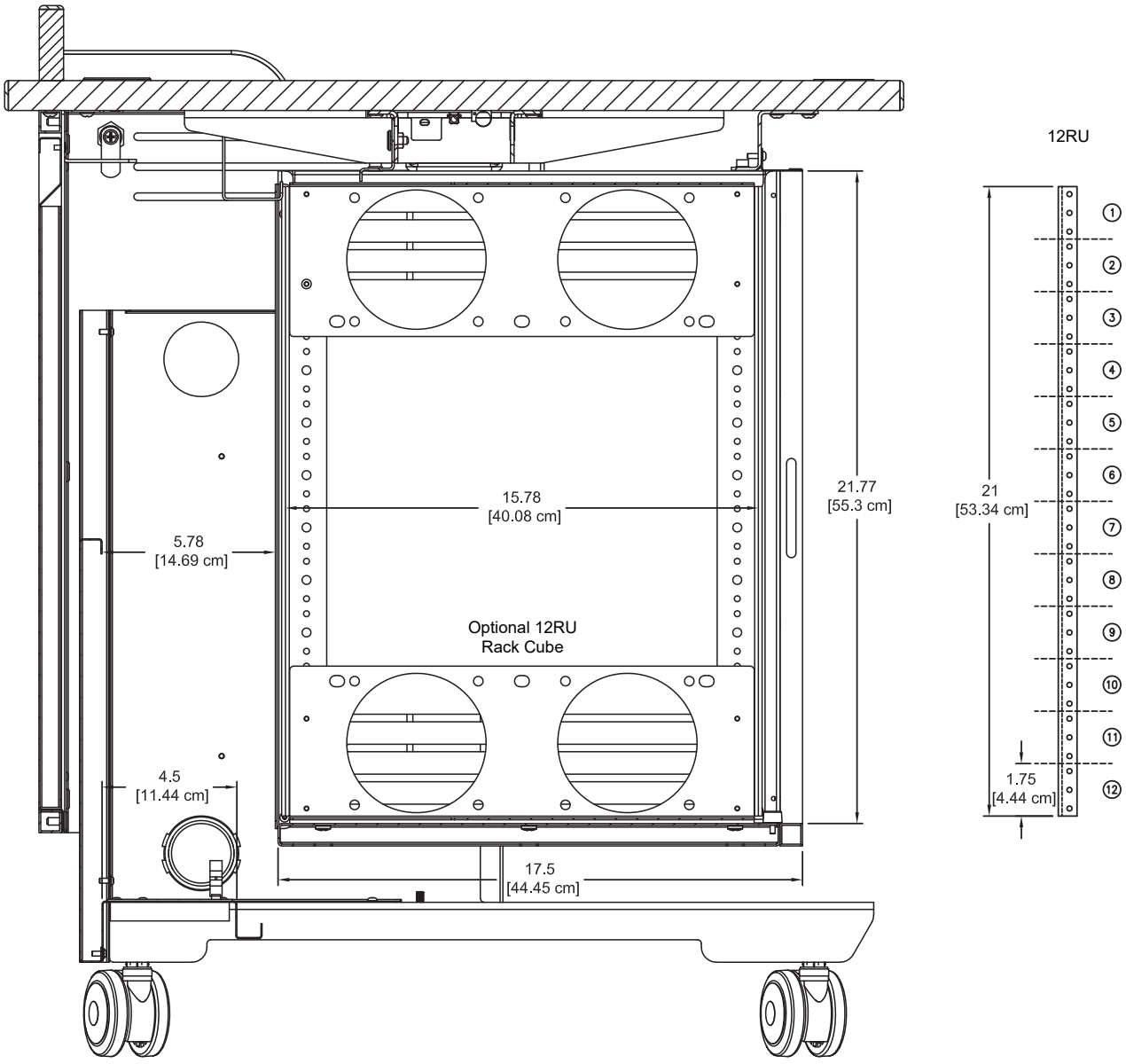




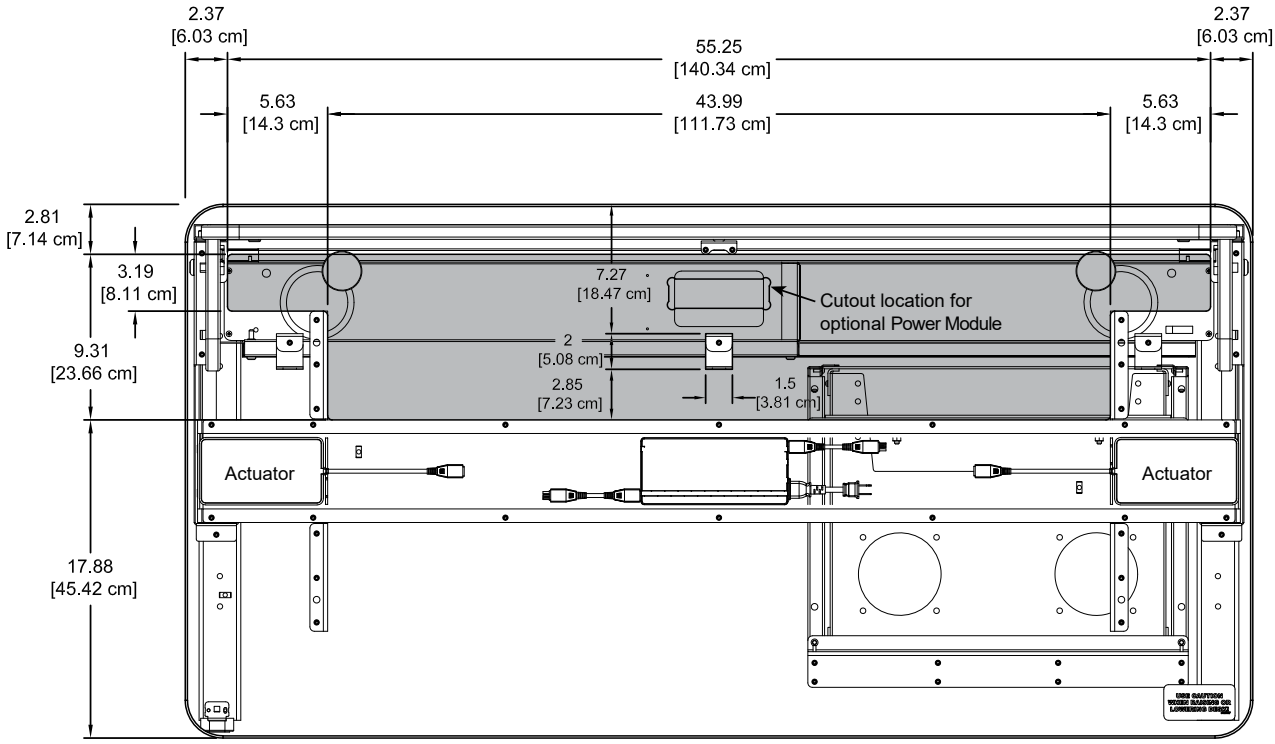


Note: The keyboard tray protrudes up to 4.9" [12.4 cm] below the worksurface. If the lectern is used for ADA use, a higher adjusted worksurface (around 34"H) is necessary to provide wheelchair clearance.

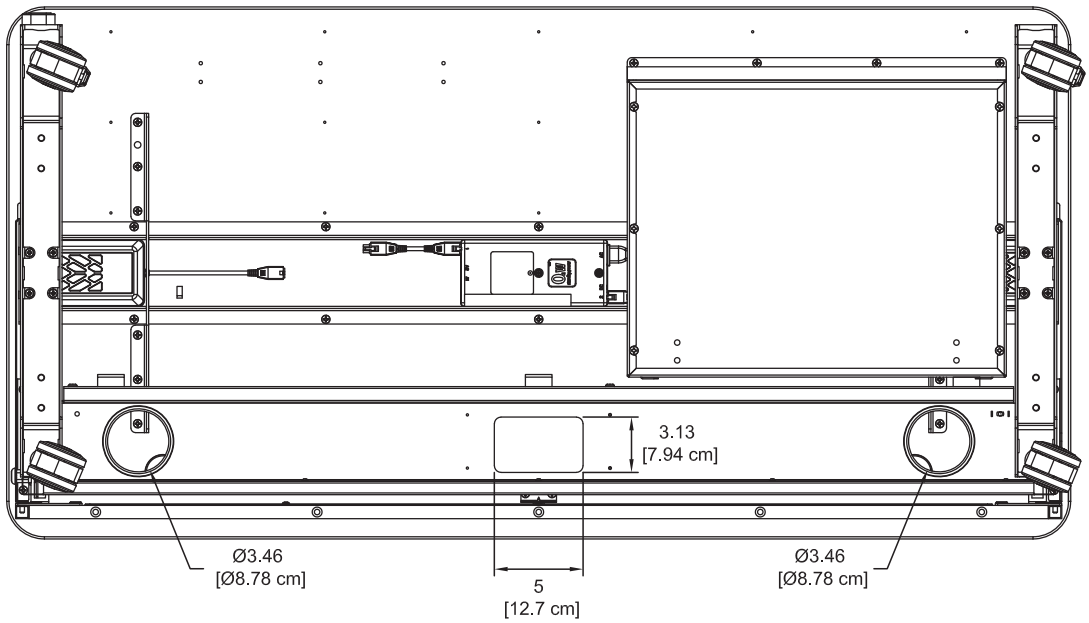
Section View A-A



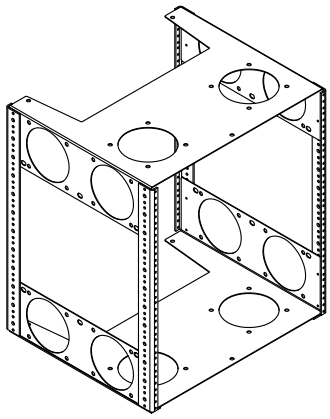
Possible cutout area in worksurface
(shown shaded)



Bottom cord access



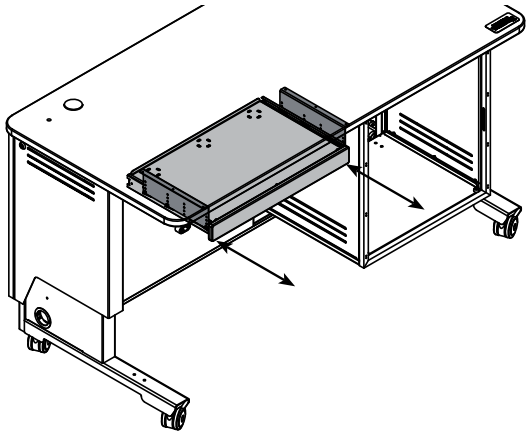
Accessories



12RU Rack Cube - 55228

- Provides the ability to integrate equipment remotely before installation into the unit
- Polyethylene slides on bottom for easy removal
- Can be secured to cabinet
- Cooling fan compatible
- Color: black
- Customer-installed

Rack rail:	12RU front and rear
Dimensions:	19.105"W [48.5 cm] x 16.03"D [40.7 cm] x 21.375"H [54.3 cm]
Mounts for cooling fans:	Compatible with most 4.7" fans with 4.13" mounting hole spacing *(12 mounting locations available)*
Unit weight:	21 lb [9.5 kg]
Shipping weight:	22 lb [10 kg]

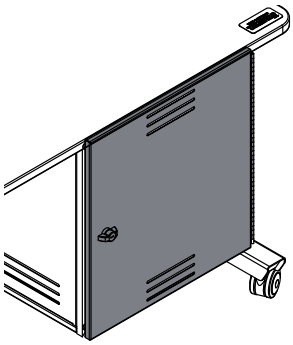


Keyboard Tray - 55602

- Tray can be installed and used as a keyboard tray or flipped and used as a storage drawer using pre-drilled mounting holes under the lectern worksurface.
- Wire management slots in tray

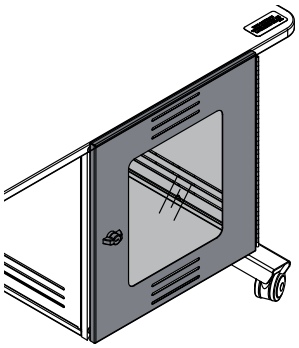
Dimensions:	23.25"W [60 cm] x 14.5"D [36.8 cm] x 4.91"H [12.5 cm]
Tray Dimensions:	21.76"W [55.3 cm] x 13.635"D [34.6 cm]
Tray heights: (space between tray and worksurface)	• 1.221" H [3.1 cm] • 1.721" H [4.4 cm] • 2.221" H [5.6 cm] • 2.721" H [6.9 cm]
Weight capacity:	25 lb [11.4 kg]
Shipping weight:	14 lb [5.4 kg]

Note: The keyboard tray protrudes up to 4.9" [12.4 cm] below the worksurface. If the lectern is used for ADA use, a higher adjusted worksurface (around 34"H) is necessary to provide wheelchair clearance.



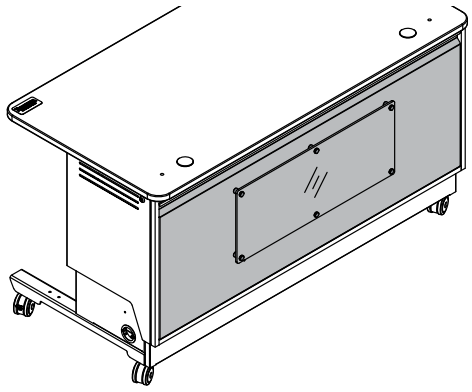
Solid Cabinet Door - 55600

- Installs on cabinet (required)
- Ventilation slots
- Can be installed hinged from the left or right-side
- Unit weight: 24 lb [10.9 kg]
- Shipping weight: 25 lb [11.4 kg]



Acrylic Cabinet Door - 55601

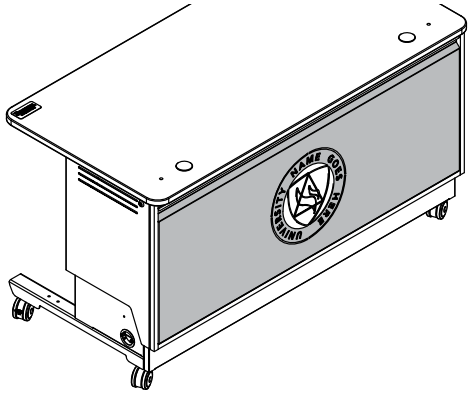
- Installs on cabinet (required)
- Ventilation slots
- Can be installed hinged from the left or right-side
- Unit weight: 24 lb [10.9 kg]
- Shipping weight: 25 lb [11.4 kg]



Customized Large Acrylic Logo Panel - 55599

- Attaches to audience-side of lectern
- Clear acrylic mounted on standoffs
- New logos require a first time logo charge
- Customer-installed
- To get panel customized-contact Spectrum for details

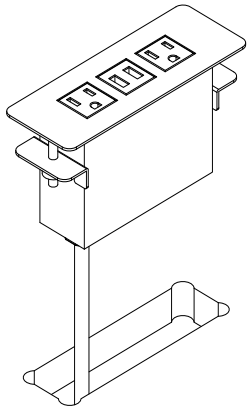
Dimensions:	57.3125"W [145.6 cm] x 23.16"H [58.8 cm] x .8125"D [2 cm]
Acrylic Dimensions:	30"W [76.2 cm] x 12"H [30.5 cm]
Shipping weight:	10 lb [4.5 kg]



Customized Large Metal Logo Panel - 55599

- Custom modesty panel attaches to audience-side of lectern
- Available with black, white, matching, or custom printed laminate backer
- New logos require a first time logo charge
- Customer-installed
- To get panel customized-contact Spectrum for details

Dimensions:	57.3125"W [145.6 cm] x 23.16"H [58.8 cm] x .8125"D [2 cm]
Available logo area:	23.125"W [71.1 cm] x 16.125"H [25.41 cm]
Shipping weight:	10 lb [4.5 kg]



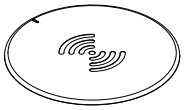
USB-C Power Module - 99075

- (2) AC power outlets (tamper-resistant)
- (1) USB charge port
- (1) USB-C charge port
- Aluminum housing and flange
- Thumbscrew clamps
- ETL-certified
- Available in black, silver, or white
- Customer-installed

Cutout required:	5.65"W x 1.65"D cutout exists under flip-up lid
Power cord:	10' [305 cm] 14AWG *3C power cord
Power receptacles:	125V, 60hz, 15A tamper-resistant
USB-C charging port:	2.4A (12W) (non data compatible)
USB charging port:	2.1A (10.5W) (non data compatible)
Dimensions:	6.38"W [16.2 cm] x 2.36"D [6 cm] x 3.54"H [9 cm]
Unit weight:	2 lb [.9 kg]
Shipping weight:	2.35 lb [1 kg]

7-Outlet Power Strip - 99024

- Electrical Rating: AC 125V, 15 Amps
- 1000 Joules surge capacity
- 12' cord length
- LED switch
- UL Listed
- Shipping weight: 1.9 lb [.86 kg]



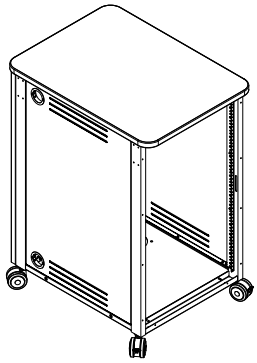
EM Wireless Charging Pad - 99057

- Uses electromagnetic technology to charge Qi V1.2 compliant IC devices ("Qi" enabled)
- LED to confirm pairing / charging
- Security tab prevents theft
- Requires 3" round cutout to be made by customer
- UL-certified

⚠ Note: The unit requires a 7" diameter of clearance to work with Qi-enabled phones placed in any orientation. The 3" dia cutout should be located on the worksurface at least 3.5" from any edge.

External Equipment Rack and Accessories

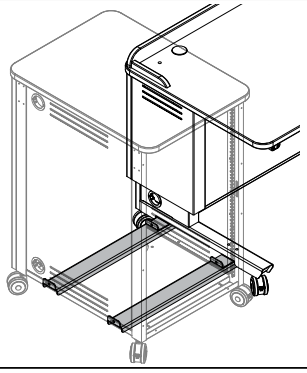
Note: The external equipment rack is used when more than 12RU of equipment rack space is necessary or a detached rack option is needed. The items on this page are only for use with the external equipment rack - 55508. The Unit-to-Unit Connector Kit - 55359 is used when a solid connection to the Freedom Pro is preferred.



Equipment Rack - 55508

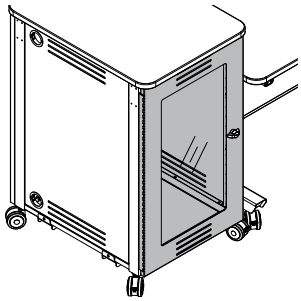
- 39”H (18RU) or 32”H (14RU)
- Front and rear rack rails
- Standard audience-side panel included
- Casters / glides assembled by customer
- 39”H [99.3 cm] or 32”H [81.3 cm] worksurface height (with casters)
- Two 2” grommets in each side panel provide cord access
- Up to two equipment racks can be attached to the lectern (1 on left and 1 on right)

Worksurface options:	• No Cutouts • Custom Cutouts • Power Module
Base options:	• Twin Wheel Casters • Glides
Door options:	• Solid door • Acrylic door
Shipping weight: (nominal)	116 lb [52.7 kg] (39”H) 102 lb [46.3 kg] (32”H)



Unit-to-Unit Connector Kit - 55359

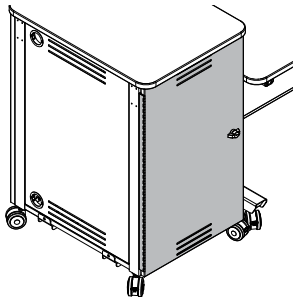
- For connecting equipment rack to lectern
- Simple installation-lectern and equipment rack can remain right-side up
- Shipping weight: 9 lb [3.9 kg]



Acrylic Locking Door

39”H - 55512
32”H - 55510

- For instructor-side installation
- Can be installed hinged from the left or right side
- Shipping weight:
  13 lb [5.9 kg] (39”H)
  11.5 lb [5.2 kg] (32”H)

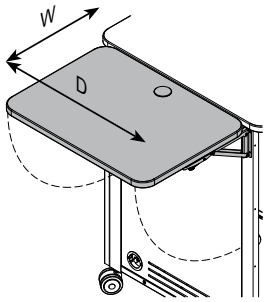


Solid Locking Door

39”H - 55511
32”H - 55509

- For instructor or audience-side installation
- Can be installed hinged from the left or right side
- Shipping weight:
  13 lb [5.9 kg] (39”H)
  11.5 lb [5.2 kg] (32”H)

Note: When used on the audience-side of the equipment rack, the door will replace the standard audience-side panel.



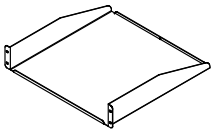
Flip-up Shelf - 55543

- Shelf hinges lock into place in the upright position
- Includes 2” grommet
- Mounts on left or right side of equipment rack
- Available in matching, or White Chalk Dry Erase laminate

Dimensions:	19.25”W [48.9 cm] x 26”D [66 cm] x 1”H [2.54 cm]
Weight capacity:	35 lb [15.9 kg]
Shipping weight:	27 lb [12.3 kg]

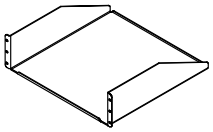
The Flip-up shelf not for use on stand-alone equipment racks. Use in conjunction with Unit-to-Unit Connector Kit - 55359

Rack-mount Accessories



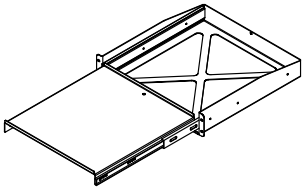
Cantilever Shelf - 2RU - 97504

- 16 ga steel
- Shelf: 17.5"W [44.45 cm] x 18"D [45.7 cm] x 3.5"H [8.89 cm]
- Weight capacity: 50 lb [22.7 kg]
- Shipping weight: 8.1 lb [3.7 kg]



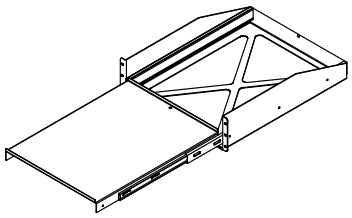
Cantilever Shelf - 3RU - 97502

- 16 ga steel
- Shelf: 17.5"W [44.45 cm] x 18"D [45.7 cm] x 5.25"H [13.33 cm]
- Weight capacity: 80 lb [36.3 kg]
- Shipping weight: 9.2 lb [4.2 kg]



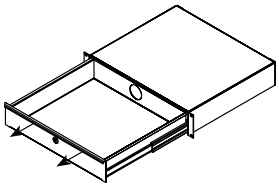
Pull-Out Shelf - 2RU - 97505

- 16 ga steel
- 17.09"W [43.42 cm] x 18.12"D [46.03 cm] x 3.5"H [8.89 cm]
- Weight capacity: 50 lb [22.7 kg]
- Shipping weight: 15.6 lb [7.1 kg]



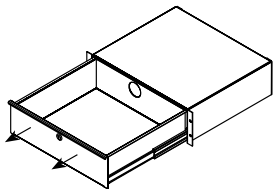
Pull-Out Shelf - 3RU - 97503

- 16 ga steel
- 17.09"W [43.42 cm] x 22.11"D [56.14 cm] x 5.25"H [13.33 cm]
- Weight capacity: 80 lb [36.3 kg]
- Shipping weight: 18.5 lb [8.4 kg]



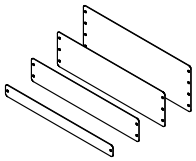
Locking Drawer - 2RU - 97527

- 16 ga steel
- Drawer: 15.97"W [40.56 cm] x 14.56"D [36.98 cm] x 3"H [7.63 cm]
- Weight capacity: 50 lb [22.7 kg]
- Shipping weight: 15.85 lb [7.2 kg]



Locking Drawer - 3RU - 97526

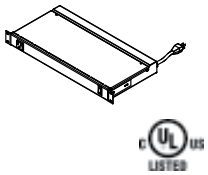
- 16 ga steel
- Drawer: 15.97"W [40.56 cm] x 14.56"D [36.98 cm] x 5.25"H [13.33 cm]
- Weight capacity: 50 lb [22.7 kg]
- Shipping weight: 18.5 lb [8.4 kg]



Rack-Mount Blanks

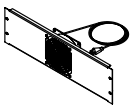
1RU - 97510 **3RU - 97512**
2RU - 97511 **4RU - 97513**

- Fills rack spaces where components are not needed
- 16 ga steel
- Shipping weight: <1 lb [.45 kg]



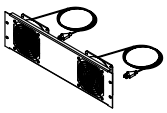
9-Outlet Power Strip - 1RU - 99021

- 8 outlets rear (breaker-protected)
- 1 convenience outlet front
- 115VAC, 60 Hz, 15 amps max
- 9' power cord
- Front LED power switch
- Enhanced surge protection
- ETL-listed, UL-listed
- 19"W [48.27 cm] x 9.25"D [23.5 cm] x 1.74"H [4.41 cm]
- Shipping weight: 8.7 lb [3.9 kg]



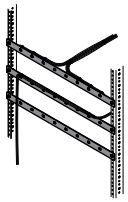
Single Fan - 3RU - 97507

- 50 cfm, 30 decibels
- 120V~50/60 Hz, 15/13W
- 6' cord length
- RoHS
- 19"W [48.27 cm] x 1.56"D [3.97 cm] x 5.25"H [13.33 cm]
- Shipping weight: 3.78 lb [1.7 kg]



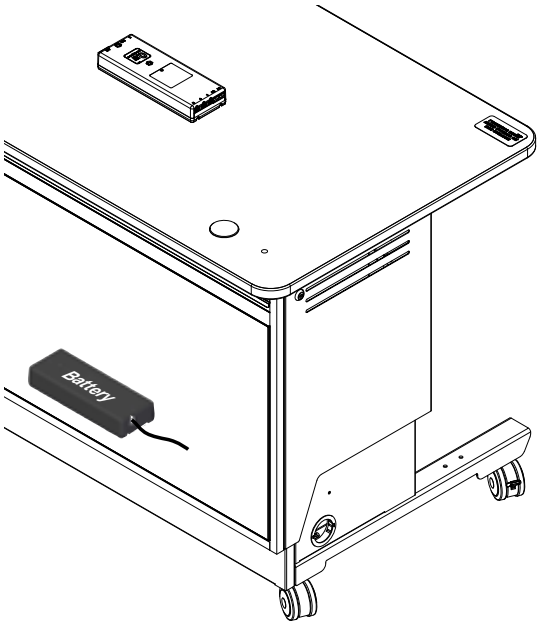
Double Fan - 3RU - 97506

- 100 cfm, 30 decibels
- 120V~50/60 Hz, 15/13W
- 6' cord length
- RoHS
- 19"W [48.27 cm] x 1.56"D [3.97 cm] x 5.25"H [13.33 cm]
- Shipping weight: 5.47 lb [2.5 kg]



Wire Lace Kit - 95517

- Provides wire management
- Mounts to standard rack rails
- Includes (3) lace straps and mounting screws
- Includes (12) 5.5" zip ties
- Shipping weight: 1.25 lb [.57 kg]

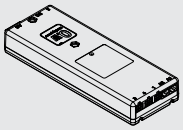


Rechargeable Battery Pack System - 99045

- Creates a mobile lectern by providing the ability to operate the unit in locations without AC power
- Compact, lightweight lithium-ion battery plugs into and charges from the existing lectern control box
- On-board LED light bars indicate charge capacity level
- Audio alarm signals when charging is needed
- Thermal switch protection, overcurrent protection
- Easy customer-installation

Battery Type	Lithium-ion
Capacity	2.2 Ah / 53 Wh
Voltage (nominal)	24V
Discharge current	9A (max)
Max charging voltage	40V DC
Charging current	0.5 A
Certifications	EN 62133 (Battery safety testing) UL 1642 (Lithium cells, standard test) UN 38.3 (Transportation of Lithium batteries) UL 2054 (Household and commercial batteries) EN 60335-1 with CBH Advanced
Unit weight: (nominal)	1.32 lb [.6 kg]
Shipping weight: (nominal)	2 lb [.9 kg]

Battery / Control Box Compatibility:



The CBD6S Linak control box is compatible with this battery pack.

Older CBD4 Linak control boxes are <u>not compatible</u> with this battery pack.

See **spectrumfurniture.com** for complete details on Spectrum's full line of monitor arms.

See **spectrumfurniture.com** for the latest accessories and detailed warranty information.

Warranty

We will make it right for you!

Thanks for choosing Spectrum! Spectrum is committed to provide complete customer satisfaction. Each of our products is manufactured from the best materials available and each product is stringently monitored throughout the production process through our P.A.C.E. program (Product Assurance to meet Customer Expectations).

We expressly warrant that Spectrum products will be of good quality and workmanship and free from defect for the period set out in the warranty from the date of delivery.

For a listing of all product specific warranty terms please visit our website at:

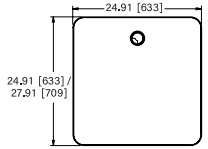
https://www.spectrumfurniture.com/en/resources/purchasing-terms-warranty

1-800-235-1262
Toll-free HELPLINE
spectrum@spectrumfurniture.com

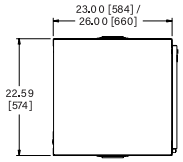
PTRK SERIES

BASIC DIMENSIONS

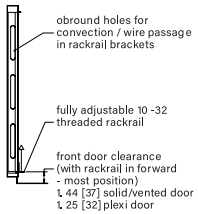
PTRK-XXMDK
top view



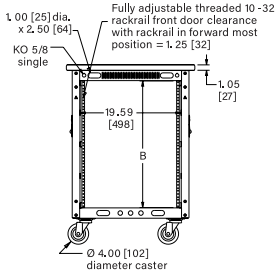
PTRK-XX
top view



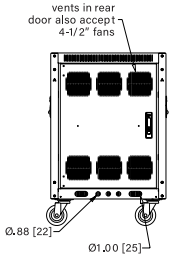
top sectional view
of PTRK side



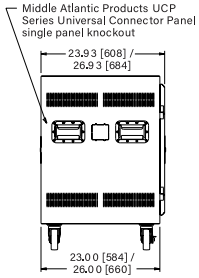
PTRK-XXMDK rear view
(with wood top shown and
doors removed to show rackrail)



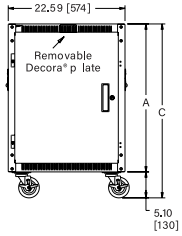
PTRK-XX rear view
(with wood top shown and
doors removed to show rackrail)



side view

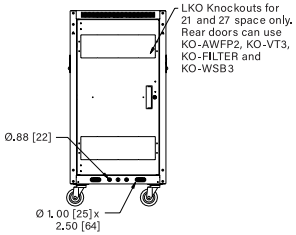


front view

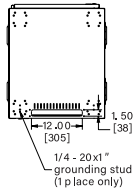


Part #	A Rack Height w/out Casters	B Useable Height	C Overall Height	Useable Depth	Overall Depth	Front Door	Rear Door
PTRK-14	28.62 [727]	24.50 [622] (14 rackspaces)	33.73 [857]	21.50 [546]	23.0 [584]	solid	vented
PTRK-21	40.87 [1038]	36.75 [933] (21 rackspaces)	46.0 [1168]	21.50 [546]	23.0 [584]	solid	LKO knockouts
PTRK-14MDK	29.67 [754]	24.50 [622] (14 rackspaces)	34.79 [884]	21.50 [546]	24.91 [633]	plexi	vented
PTRK-21MDK	41.92 [1065]	36.75 [933] 21 rackspaces)	47.0 [1195]	21.50 [546]	24.91 [633]	plexi	LKO knockouts
PTRK-1426	28.62 [727]	24,50 [622] (14 rackspaces)	33.73 [857]	24.50 [622]	26.0 [660]	solid	vented
PTRK-2126	40,87 [1038]	36,75 [933] (21 rackspaces)	46,0 [1168]	24,50 [622]	26,0 [660]	solid	LKO knockouts
PTRK-2726	51,37 [1305]	47,25 [1200] (27 rackspaces)	56,5 [1435]	24,50 [622]	26,0 [660]	solid	LKO knockouts
PTRK-1426MDK	29,67 [754]	24,50 [622] (14 rackspaces)	34,79 [884]	24,50 [622]	27,91 [709]	plexi	vented
PTRK-2126MDK	41,92 [1065]	36,75 [933] (21 rackspaces)	47,04 [1195]	24,50 [622]	27,91 [709]	plexi	LKO knockouts
PTRK-2726MDK	52,42 [1331]	47,25 [1200] (27 rackspaces)	57,52 [1461]	24.50 [622]	27.91 [709]	plexi	LKO knockouts

rear view
(without wood top, 21 and 27 space)



bottom view
(casters removed)



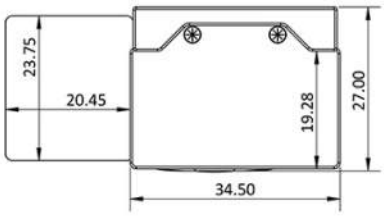
LEGRAND | AV COMMERCIAL BRANDS
C2G | Chief | Da-Lite | Luxul | Middle Atlantic | Vaddio | Wiremold

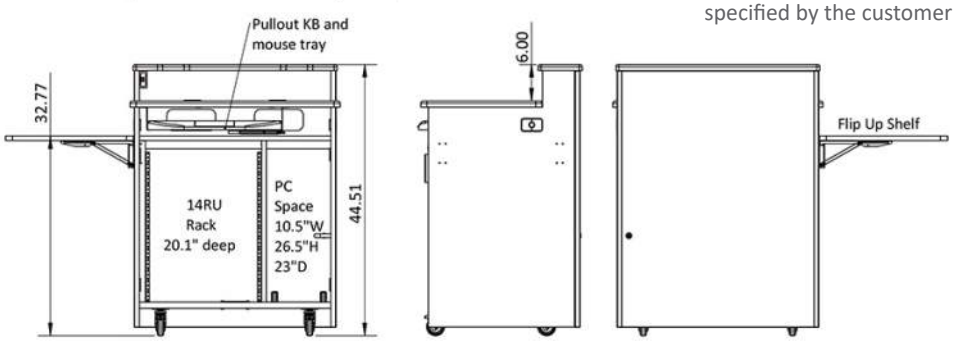
ROLLING RACK - OPTION "B"

1. Audio Visual Furniture International
   a. Model: PD3009
   b. Rolling Podium with Flip-Up Shelf

PD3009 Teaching Podium with Folding Shelf

AUDIO VISUAL FURNITURE International





Model **PD3009** podium features a smaller footprint yet retains full size features with a divided interior configured with EIA compliant 14U rack rails on the left side and tower PC storage space on the right.

Standard Features

- Large 34.5" W x 25.5" D work surface to accommodate monitors, laptops and presentation documents
- Slide-out molded keyboard tray with mouse pad
- Folding side shelf - Black only
- 14U space 19" EIA compliant threaded rack rails (20.12" deep)
- PC/Storage compartment
- Quiet 120mm cooling fan
- Large rear door for equipment access
- Locking front doors
- Modern design with aluminum corner accents
- Heavy duty casters (2 locking)
- Many laminate finishes to choose from
- Ships assembled

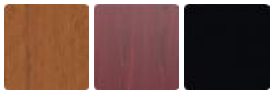
Options

- **C900S/C900D** Single/Dual adjustable monitor arm
- **PLM1022** 10" - 24" Monitor mount
- **MM1232** 12" - 32" Monitor mount
- **MCB1925** 19" - 25" Monitor/camera bracket
- **FM3** Count down timer/clock
- **MIC-18** MX418 S/C Shure Gooseneck microphone
- **LIGHT-18** Littlite Gooseneck
- **PB** Six outlet power bar with 10 ft. cord
- **PC-PATCH** 2x 110AC, RJ45, Phone, 2xUSB
- **SF-PB3** Surface mounted 3-outlet 120V power bar
- **CUB3** Round cable well
- **CUB4** Black-B/Silver-S Power Panel
- **CUB5** Round cable well (Black or silver)
- **CUB8** Table top cable well
- **CHGQIW/B** Wireless charging station white or black
- **CHGQI-DNGL** Dongle Lightning, USB Type-C, Micro-USB. Requires CHGQIW/B
- **9107** Lacing bar (19" long)
- **SH-FL** Additional folding shelf on other side
- **RR14** 14U rear rack rails
- **9031/9041/9052** Metal shelves/drawer (check website)
- **LEV4AX4** 4x Levelers for non-mobile applications
- **CUSTOM CUTOUT** Cutouts for electronics or other items specified by the customer

Specifications

Model: PD3009
Width: 35"
Depth: 27"
Height: 44.5"

Finishes



Other finishes are available. Check website.

APPENDIX 01 04 | DIGITAL SUBMITTAL PROCEDURES

Broward College utilizes Procore Project Management Software to track Construction Submittals, Construction Contingency Allowance (CCA), and Payment Applications.

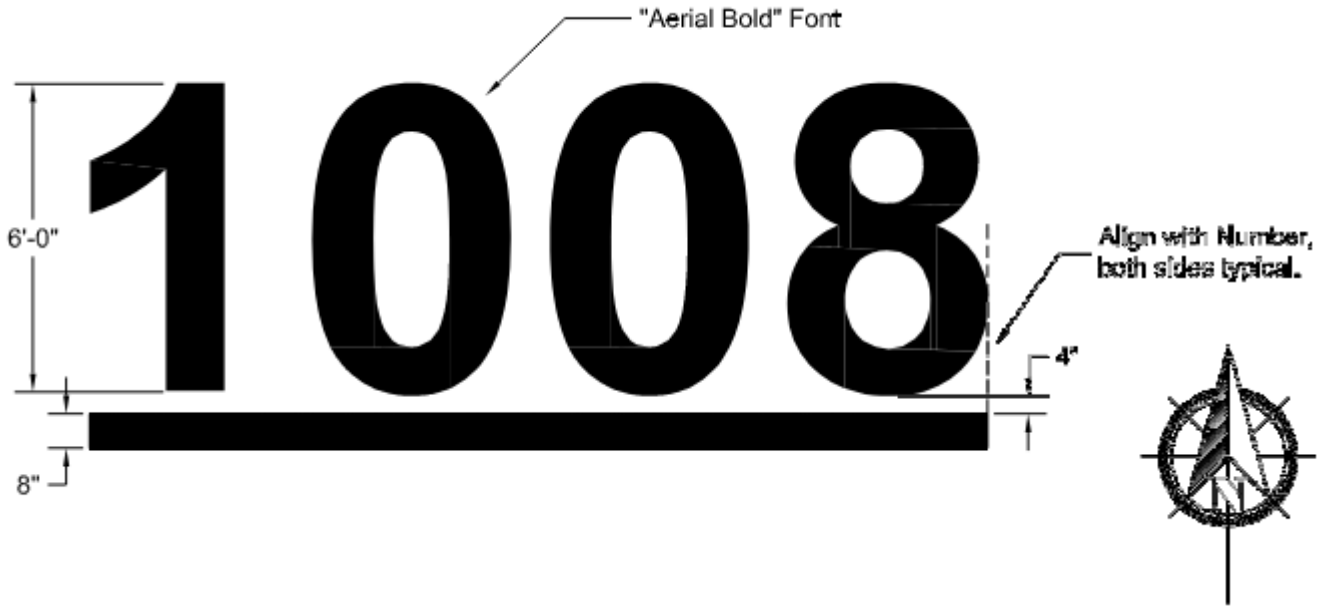
1. Construction Submittals (i.e., materials data, product data, product samples, shop drawings, and more).
    a. Subcontractor Documentation Preparation & Submittal:
        i. CM prepares a list of each submittal that is required for the project, with assigned CSI code, description, vendor who is responsible, and material expediting dates to distributes to BCPM and subcontractors for reference.
        ii. Subcontractor obtains/prepares and reviews product data/submittal information and confirms compliance with the specifications/drawings for acceptable materials and attributes.
        iii. Subcontractor prepares PDF cover sheet by populating information for:
            1. Specification reference # (i.e. 03300-001 Cast-in-Place Concrete)
            2. Lead time for material
            3. Material supplier and contact name and phone number
            4. Check box that product is in compliance with specifications
            5. Add comments as needed.
        iv. Subcontractor binds PDF cover sheet to PDF product data. Product data should be the original digital file from supplier if possible, otherwise a clear/legible scan document.
        v. Subcontractor saves the file with the following filename format and sends it to the GC: "03300-001 Concrete Form Release – For Approval 2019-06-06"
    b. CM Submittal Review & Submittal:
        i. CM populates received date, verifies compliance with the contract documents, verifies lead time is compliant with the schedule, and adds comments as needed, including comments relating to coordination with other vendors. Review duration should not exceed 7 days, or as identified in contract.
        ii. CM will save a copy and revise the date (in the file) to match when it is submitted digitally through Procore.
    c. CM Uploads Submittal to Procore:
        i. CM will be responsible to upload all construction submittals to Procore.
        ii. CM shall assign the Architect of Record (or Engineer if Prime) as approver and copy BCPM.
        iii. For a step by step guide on how to upload a submittal to Procore please visit: https://support.procore.com/products/online/user-guide/project-level/submittals/tutorials/create-a-submittal-revision
    d. Architect Submittal Review:
        i. The Architect will be assigned by the CM to approve each submittal first.
        ii. The Architect or the person in turn to approve shall mark "No Exception Taken" "Implement Exceptions Taken" "Rejected" or "Revised and resubmit" in Procore. This will automatically notify the CM of the change.
    e. Revised Submittal Process:
        i. If the Architect or the person in turn to approve has selected "Rejected" or "Revised and resubmit" in Procore. This will automatically notify the CM of the change.
        ii. The CM shall create a different submittal and rename it in the following format: "03300-001-R1 Concrete Form Release – For Approval 2019-07-06"
2. Construction Contingency Allowance (CCA)
    a. CM Uploads Submittal to Procore:
        i. CM will be responsible to upload all CCA's as a submittal through Procore.
        ii. CM shall assign the Architect as first approver and BCPM as second approver.
3. Payment Applications
    a. CM Uploads Submittal to Procore:
        i. CM shall send a pencil copy of each Payment Application to the BCPM through email first including:
            1. G702 – Payment Application
            2. G703 – Continuation Sheet
            3. Backup documentation

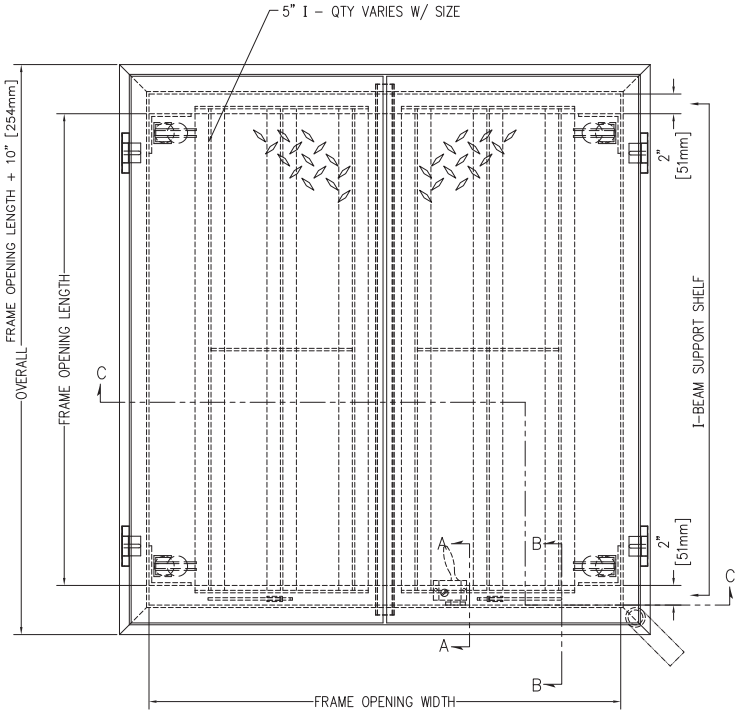
4. Release of Liens
5. Purchase Order copy

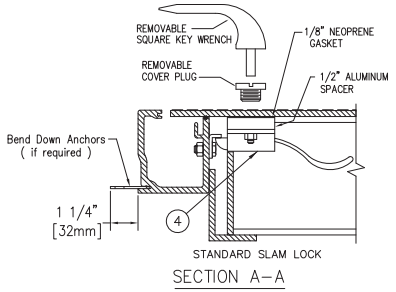
ii. CM will be responsible to upload all Payment Applications as a submittal through Procore.
iii. CM shall assign the Architect as first approver and BCPM as second approver.
iv. CM must copy Juan Rosa (jrosa@broward.edu) & Patsy Lenox (plenox@broward.edu) in the distribution list for Payment Applications only.

APPENDIX 07 01 | ROOF IDENTIFICATION NUMBER

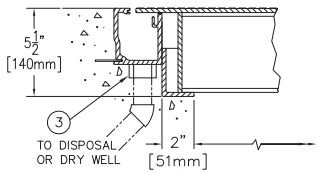
1. Building Identification Number Specifications
   a. The contractor at the completion of the roof membrane installation shall adhere a manufacturers cut number to the completed roof, using the roofing manufacturer's approved adhesive. The font shall be Arial Bold.
   b. The numbers and underline shall be the same materal as the roofing membrane or as approved by the roofing manufacturer. Color shall be contrasting (tyically black). The underline shall begin at the edge of the first number, and finish at the edge of the last number.
   c. The contractor shall orient the number so that the top of the number is to the north.
   d. Confirm the location of the number with the Broward College Project Manager





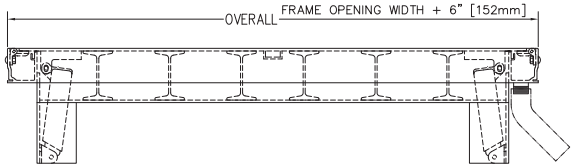


SECTION A–A

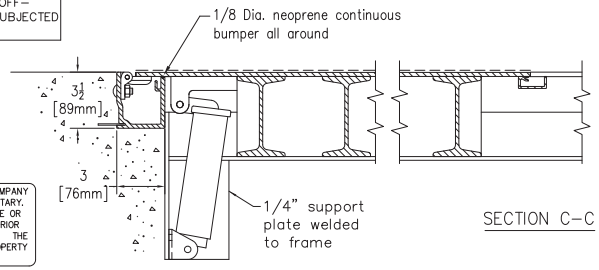


CHANNEL SUPPORT SHELF MUST BE SUPPORTED BY CONCRETE OR STEEL TO CARRY H–20 LOADING

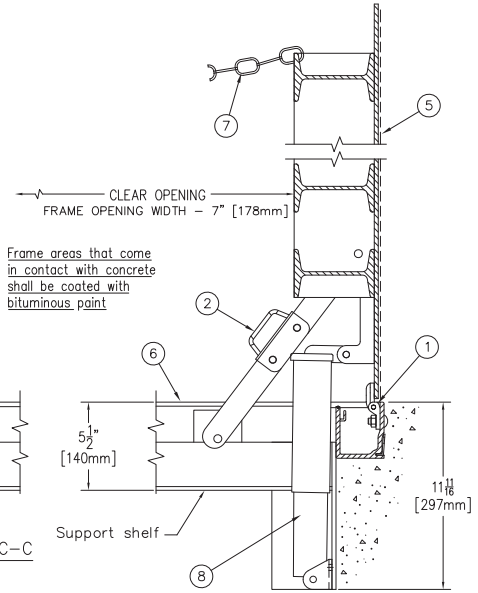
SECTION B–B



NOTE:
DESIGNED TO WITHSTAND H–20 WHEEL LOADINGS SUITABLE FOR USE IN OFF–STREET LOCATIONS WHERE NOT SUBJECTED TO HIGH DENSITY TRAFFIC



SECTION C–C



SPECIFICATIONS

1. Bilco heavy duty forged stainless steel hinges with stainless steel pins
2. Bilco automatic hold open arm
3. 1–1/2" drain coupling
4. Standard slam lock
5. 1/4" aluminum diamond pattern plate cover
6. Bilco 1/4" aluminum channel frame with recessed anchors
7. Heavy duty check chain
8. Stainless steel lifting mechanism

SHOP FINISH:
ALUMINUM: MILL FINISH
HARDWARE: TYPE 316 STAINLESS STEEL
(unless otherwise specified)

REINFORCED FOR H20 LOADING

INSTALLER NOTES:

A. Use caution. Cover is spring loaded. Do not remove safety shipping bolt until unit is to be installed and in normal horizontal operating position.
B. Be sure unit is set on slight pitch toward drain corner.
C. Before anchoring in place open and close door. Check to see that the door in the closed position rests on the frame all around. If not, shim under the frame at the proper corner.
D. Do not reduce 1 1/2" drain pipe to dry well or disposal system.
E. Bend down anchors if required

Customer:

P.O. N°

Job:

Sales Rep:

Manufacturers of Doors for Special Services
THE BILCO COMPANY
New Haven, Connecticut 06505

DOUBLE LEAF ACCESS DOOR TYPE JD-ALH20 - EXTERIOR

QTY	TYPE	SIZE WIDTH x LENGTH
☐	JD-1ALH20	4'-0" x 2'-6" [1220mm] x [762mm]
☐	JD-2ALH20	4'-0" x 4'-0" [1220mm] x [1220mm]
☐	JD-3ALH20	4'-0" x 6'-0" [1220mm] x [1830mm]
☐	JD-4ALH20	5'-0" x 5'-0" [1525mm] x [1525mm]

DUNE™

Square Lay-in & Tegular
fine texture

SUSTAIN®
High Performance
Sustainable
Ceiling Systems

CAD/Revit® drawings at:
armstrongceilings.com/cadrevit

Dune Square Lay-in panels with Prelude XL 15/16" suspension system

Dune Tegular panels with Interlude XL HRC 9/16" suspension system

Fine-textured panels are non-directional and durable with standard acoustical performance.

KEY SELECTION ATTRIBUTES

- Dune™ panels are part of the Sustain® portfolio, and meet the most stringent industry sustainability compliance standards today
- Upgrade look at a modest price
- Ceiling-2-Ceiling™ Post-consumer Recycled Content options: Items 1773HRC, 1774HRC, 1775HRC, 1776HRC, 1777HRC (check armstrongceilings.com/ecomedes)
- Mold- and mildew-resistant surface
- USDA-Certified Biobased Product – 99%
- Durable – Scratch-resistant
- Non-directional visual reduces scrap and installation time
- Product can be recycled through the Armstrong Ceilings Recycling Program
- 30-Year Limited System Warranty against visible sag (excludes items 1796 and 1798), mold and mildew
- 10-Year replacement panel available for items 1772, 1773, 1774, 1776
- Made in the U.S.A. of domestic and global content
- Build America, Buy America (BABA) Act compliant

10-YEAR REPLACEMENT PANEL AVAILABILITY

COLOR

White
(WH)

DETAILS (Other Suspension Systems compatible. Refer to listing on next page.)

1. Dune™ Tegular
2. Dune™ Square Lay-in with Prelude® 15/16" suspension system
3. Dune™ Tegular with Suprafine® 9/16" suspension system
4. Dune™ Tegular with Silhouette® XL® 9/16" suspension system with 1/4" reveal
5. Dune™ Tegular with Interlude® XL® HRC 9/16" suspension system

TechLine 877 276-7876
armstrongceilings.com/dune

Armstrong®
World Industries

DUNE™

Square Lay-in & Tegular
fine texture

USDA CERTIFIED BIOBASED PRODUCT PRODUCT 99%+

CLOSED LOOP RECYCLED CONTENT CEILING-2-CEILING

SUSTAIN High Performance Sustainable Ceiling Systems

Declare.

LEED® | WELL™ | LBC

UP TO 56% RECYCLED CONTENT

Calculate sustainability with Ecomedes armstrongceilings.com/ecomedes

energy management; construction waste mgmt; regional materials; design for flexibility; EPD; recyclable/ extended producer resp.; biobased materials; recycled content; sourcing of raw materials; material ingredient reporting; low emitting/ materials; lighting quality; acoustics

▲ LOCATION DEPENDENT

VISUAL SELECTION

PERFORMANCE SELECTION

Dots represent high level of performance. $$$$

armstrongceilings.com/suspdwgs	Susp. Dwg.	Item No.	Dimensions (Inches)	UL Classified Acoustics NRC	+ CAC	=	Total Acoustics[1]	Fire Performance	Light Reflect	Bio-Block Anti-Mold/ Mildew	Humi-Guard+ Sag Resistant	Certified Low VOC Emissions	DURABILITY Scratch	Recycled Content	Recycle Program	30-Yr Warranty
DUNE™ 15/16" Square Lay-in	1	1772	24 × 24 × 5/8"	0.50	30		N/A	Class A	0.81	•	•	•	•	Std	•	•
		1850	24 × 24 × 5/8"	0.50	35 •		N/A	Fire Guard™	0.81	•	•	•	•	Std	•	•
		1773 1773HRC	24 × 48 × 5/8"	0.50	30		N/A	Class A	0.81	•	•	•	•	Std •	•	•
		1851	24 × 48 × 5/8"	0.50	35 •		N/A	Fire Guard	0.81	•	•	•	•	Std	•	•
		1796	20 × 60 × 3/4"	0.50	35 •		N/A	Class A	0.81	•	Std	•	•	•	•	1-Yr
		1798	30 × 30 × 3/4"	0.50	35 •		N/A	Class A	0.81	•	Std	•	•	•	•	1-Yr
		new 4272	30 × 60 × 3/4"	0.50	35 •		N/A	Class A	0.81	•	Std	•	•	•	•	1-Yr
		3/4" or 5/8" Thick – 15/16" Square Lay-in														
Made-to-Order Sizes	4-6 WEEKS order to ship	Width 12" - 30"	Length 18" - 72"	N/A	N/A		N/A	Class A	0.81	•	Std	•	•	Std	•	1-Yr

MORE ITEMS ▶

Red Numbers are Fire Guard items.

[1] Total Acoustics® ceiling panels have an ideal combination of sound absorption and sound blocking in one product.

SUSPENSION SYSTEMS

15/16"

Prelude® XL®

Prelude® XL® Fire Guard

PHYSICAL DATA

Material
Wet-formed mineral fiber

Surface Finish
Factory-applied latex paint

Fire Performance
Class A: ASTM E84 and CAN/ULC S102 surface burning characteristics. Flame Spread Index of 25 or less. Smoke Developed Index of 50 or less (UL® labeled).

Fire Guard™: A fire-resistive ceiling when used in applicable UL assemblies.

ASTM E1264 Classification
Type A, Form A1.2, Pattern E; Fire Class A

Humidity/Sag Resistance
HumiGuard® Plus ceiling panels are recommended for areas subject to high humidity, up to, but not including, standing water and outdoor applications. Excludes large made-to-order panels.

Anti-Mold/Mildew
Ceiling tiles with BioBlock® performance resist the growth of mold and mildew on the tile surface.

Acoustical Performance
CAC testing conducted using Prelude® suspension system.

VOC Emissions
Third-party certified compliant with California Department of Public Health CDPH/EHLB/Standard Method Version 1.2, 2017. This standard is the guideline for low emissions in LEED®, WELL Building Standard™, Living Building Challenge® (LBC), CalGreen Title 24, ANSI/ASHRAE/USGBC/IES Standard 189; ANSI/GBI Green Building Assessment Protocol.

High Recycled Content
Contains greater than 50% total recycled content. Total recycled content based on product composition of post-consumer and pre-consumer (post-industrial) recycled content per FTC guidelines. HRC items contain 15% or greater post-consumer recycled ceilings.

Insulation Value
R Factor – 1.6 (BTU units)
R Factor – 0.28 (Watts units)

30-Year Performance Guarantee & Warranty
When installed with Armstrong® Suspension System. Details at armstrongceilings.com/warranty (Excludes items 1796, 1798, and large other size panels)

Weight; Square Feet/Carton
1772 – 0.94 LBS/SF; 64 SF/CTN
1773 – 0.88 LBS/SF; 64 SF/CTN
1796 – 1.33 LBS/SF; 67 SF/CTN
1798 – 1.14 LBS/SF; 50 SF/CTN
1850 – 1.19 LBS/SF; 48 SF/CTN
1851 – 1.22 LBS/SF; 64 SF/CTN
4272 – 1.14 LBS/SF; 75 SF/CTN

Minimum Order Quantity
1 carton, excludes made-to-order panels

Metric Items Available
1772M, 1850M, 1773M, 1851M, 1796M, 1798M – Metric items are subject to extended lead times and minimum quantities. Contact your representative for more details.

TechLine 877 276-7876
armstrongceilings.com/dune

Armstrong® World Industries

MINERAL FIBER – Standard

OPTIMA® Health Zone™
OPTIMA® PB Health Zone™

with Plant-based Binder
Square Lay-in
smooth texture

SUSTAIN®
High Performance Sustainable Ceiling Systems
(PB Suffix Only)

CAD/Revit® drawings at:
armstrongceilings.com/cadrevit

Optima® Health Zone™ Square Lay-in panels with Prelude® XL® 15/16" suspension system

Perfect for office, education, and healthcare spaces

Fine texture ceiling; combines exceptional acoustical absorption for open plan spaces, sustainability, and functionality attributes in one panel that is especially durable and aesthetically pleasing for every healthy space.

KEY SELECTION ATTRIBUTES

- Optima® PB Health Zone™ panels are part of the Sustain® portfolio and meet the most stringent industry sustainability compliance standards today
- Items with PB suffix are manufactured with a plant-based binder
- Anti-Bacterial/Mold/Mildew – BioBlock® Plus performance resists the growth of odor and stain-producing bacteria as well as mold and mildew on the ceiling tile surface
- Exceptional durability and cleanability – impact-, scratch-, and soil-resistant
- CleanAssure™ – safe for use with disinfectant cleaners
- Meets or exceeds USDA/FSIS and FGI guidelines
- Clean room performance up to ISO Class 5 (Class 100) using gasketed Clean Room™ suspension systems (items 3114, 3115)
- Meets ISO Class 5 particulate shedding requirements; not suitable for use in pressurized environments
- Long-lasting water-repellency; washable and scrubbable
- Energy-saving, high light-reflective finish
- 30-Year Limited System Warranty against visible sag, mold, mildew, and bacterial growth
- Made in the U.S.A. of domestic and global content
- Build America, Buy America (BABA) Act compliant

TYPICAL APPLICATIONS

Healthcare:
- Assists in addressing HIPAA, HCAHPS, and FGI Guidelines
- Patient rooms (walls-to-deck)
- Treatment rooms (walls-to-deck)
- Nurses' stations
- Emergency rooms
- Semi-restricted surgical areas
- Kitchens/food preparation areas
- Laboratories

Education

Office

Clean Rooms (Items 3214, 3215)
- Medical facilities
- Data centers

COLOR

White
(WH)

DETAILS

1. Optima® Health Zone™ Square Lay-in
2. Optima® Health Zone™ Square Lay-in with Clean Room™ 15/16" suspension system

TechLine 877 276-7876
armstrongceilings.com/healthzone

Armstrong®
World Industries

OPTIMA® Health Zone™
OPTIMA® PB Health Zone™
with Plant-based Binder
Square Lay-in
smooth texture

SUSTAIN® High Performance Sustainable Ceiling Systems (PB Suffix Only)

Declare®

RECYCLED CONTENT
UP TO 71%

LEED V5 — Ecomedes Data

COMMON MATERIALS FRAMEWORK

Human Health	Declare Label	Climate Health	EPD
	HPD	Ecosystem Health	EPD
	3rd Party CDPH	Circular Economy	✓
OCCUPANT EXPERIENCE		Acoustics	✓

VISUAL SELECTION

PERFORMANCE SELECTION
Dots represent high level of performance. $$$$

armstrongceilings.com/suspdwgs	Susp. Dwg.	Item No.	Dimensions (Inches)	UL Classified Acoustics NRC + CAC =	Total Acoustics[1]	Articulation Class AC	Fire Performance	Light Reflect	Bio-Block+ Anti-Bacterial/ Mold/ Mildew	Humi-Guard+ Sag Resistant	Certified Low VOC Emissions	CleanAssure™ Disinfectable Panels: Fog & Spray	Wipe	DURABILITY: Water Repel	Wash	Scrub	Impact	Scratch	Soil	30-Yr Warranty
OPTIMA® Health Zone™ 15/16" Square Lay-in	1, 6, 7	3114PB*	24 × 24 × 1"	0.95 •	N/A	190 •	Class A	0.86 •	+	•	•	•	•	•	•	•	•	•	•	•
		3314	24 × 24 × 1-1/2"	0.95 •	29	190 •	Class A	0.86 •	+	•	N/A	•	•	•	•	•	•	•	•	•
		3115PB*	24 × 48 × 1"	0.95 •	N/A	190 •	Class A	0.86 •	+	•	•	•	•	•	•	•	•	•	•	•
		3315	24 × 48 × 1-1/2"	0.95 •	29	190 •	Class A	0.86 •	+	•	N/A	•	•	•	•	•	•	•	•	•
Made-to-Order Sizes		PB 1" Thick – 15/16" Square Lay-in	Width (short side) / Length (long side)	N/A	N/A	N/A	N/A	Class A	0.86 •	+	•	•	•	•	•	•	•	•	•	•	•
			4" – 47-1/2" / 9" – 48"																	
		Non-PB 1" Thick – 15/16" Square Lay-in																		
			4" – 47-1/2" / 9" – 48"	N/A	N/A	N/A	N/A	Class A	0.86 •	+	•	N/A	•	•	•	•	•	•	•	•	•
		Non-PB 1-1/2" Thick – 15/16" Square Lay-in																		
			4" – 47-1/2" / 9" – 48"	N/A	N/A	N/A	N/A	Class A	0.86 •	+	•	N/A	•	•	•	•	•	•	•	•	•

1 Ctn Min FASTSIZE 3 WEEKS order to ship

Visit the product page online and see "Configure an Item" to verify capabilities. Questions? email Techline@armstrongceilings.com

[1] Total Acoustics® ceiling panels have an ideal combination of sound absorption and sound blocking in one product.
* Item provides Clean Room Performance up to ISO Class 5 (Class 100) using gasketed Clean Room™ suspension systems

SUSPENSION SYSTEMS

1-1/2" — Co-Extruded Clean Room™ (Aluminum)

15/16" — Prelude®, Prelude Plus, Prelude® Plus XL® Aluminum

PHYSICAL DATA

Material
3114PB, 3115PB – Fiberglass with DuraBrite® scrim acoustically transparent membrane.
3314, 3315 – Fiberglass with DuraBrite acoustically transparent membrane; CAC backing.

Surface Finish
DuraBrite with factory-applied latex paint

Fire Performance
Class A: ASTM E84 and CAN/ULC S102 surface burning characteristics. Flame Spread Index of 25 or less. Smoke Developed Index of 50 or less (UL® labeled).

ASTM E1264 Classification
Type B, Form B2, Pattern E; Fire Class A

Humidity/Sag Resistance
HumiGuard® Plus ceiling panels are recommended for areas subject to high humidity, up to, but not including, standing water and outdoor applications.

Anti-Bacterial/Mold/Mildew
Ceiling tiles with BioBlock® Plus performance resist the growth of odor and stain-producing bacteria as well as mold and mildew on the ceiling tile surface.

VOC Emissions (PB suffix items only)
Third-party certified compliant with California Department of Public Health CDPH/EHLB/Standard Method Version 1.2, 2017. This standard is the guideline for low emissions in LEED®, WELL Building Standard™, Living Building Challenge® (LBC), CalGreen Title 24, ANSI/ASHRAE/USGBC/IES Standard 189; ANSI/GBI Green Building Assessment Protocol.

High Recycled Content
Contains greater than 50% total recycled content. Total recycled content based on product composition of post-consumer and pre-consumer (post-industrial) recycled content per FTC guidelines.

Insulation Value
R Factor – 4.0 (BTU units)
R Factor – 0.70 (Watts units)

Application Considerations
For Clean Room installations, use full-size panels. Testing for Clean Room 5 (Class 100) was completed with full-size 15/16" gasketed suspension system. For Clean Rooms that require field-cut perimeter panels, use Lay-in panels (3114, 3115) or Tegular panels (3214, 3215) with Lay-in field-cut panels at the perimeter.

Meets ISO Class 5 particulate shedding requirements; not suitable for use in pressurized environments.

Cleaning and Disinfecting
Cleaning and CDC-recommended disinfecting options available on armstrongceilings.com/cleaning

30-Year Performance Guarantee & Warranty
When installed with Armstrong® Suspension System. Details at armstrongceilings.com/warranty

Weight; Square Feet/Carton
3114PB – 0.46 LBS/SF; 48 SF/CTN
3115PB, 3315 – 0.45 LBS/SF; 96 SF/CTN
3314 – 0.67 LBS/SF; 32 SF/CTN

Minimum Order Quantity
1 carton

FIBERGLASS – Standard

Techline / 1.877.276.7876

Armstrong®


Sustainability Profile
Up to
62%
Recycled Content
ecomedes
Sustainable Product Search Tool
Get Started
Recyclable via the Armstrong Ceilings Recycling Program
Learn More
LEED • WELL • Living Building Challenge
Recyclable/Extended Producer Responsibility
Energy Management
Construction Waste
Regional Materials
Design for Flexibility
EPD
Biobased Materials
Recycled Content
Sourcing of Raw Materials
Material Ingredient Reporting
Low emitting/materials
Lighting Quality
Acoustics
SUSTAIN
High Performance Sustainable Ceiling Systems
Learn More
Declare.
Living Building Challenge Compliant
Learn More

PRELUDE® XL® and PRELUDE XL High Recycled Content (HRC)

Exposed Tee Suspension System

SUSTAIN™
High Performance Sustainable Ceiling Systems

Prelude XL suspension system

This hot-dipped galvanized steel 15/16" suspension system offers high recycled content for improved LEED® credits.

KEY SELECTION ATTRIBUTES

- **Seismic Rx®** Suspension System saves time and money; Armstrong Ceilings offers an ICC-ES approach to installations (ESR-1308)
- **Prelude® XL®** is part of the Sustain™ portfolio and meets the most stringent industry sustainability compliance standards today
- **CleanAssure™** family of products – includes disinfectable panels, suspension systems, and trim (Cleaning and CDC-approved disinfecting options available on armstrongceilings.com/cleaning)
- **PeakForm®** profile increases strength and stability for improved performance during installation
- **SuperLock™** main beam clip is engineered for a strong, secure connection and fast, accurate alignment confirmed with an audible click; easy to remove/relocate
- Hot-dipped galvanized coating inhibits red rusting better than electrogalvanized or painted systems
- 10-Year Limited System Warranty; 30-Year Limited Ceiling Systems Warranty when used with **HumiGuard® Plus** products
- **Made-to-order** main beams and cross tees can be ordered for your project needs in one carton minimum
- XL® staked-on end detail provides secure locked connection: easy to remove, reuse, and relocate
- Fire Guard™ options offer UL® design fire-rated performance
- Some items available in metric sizes
- Blizzard White and Charcoal Black powder-coated finish
- Linear lighting integration is easy with made-to-order main-beam-to-cross-tee adapters, rout spacing, miter spacing, and short cross tees (3" to 6" lengths)
- 10-Year replacement items available

10-YEAR REPLACEMENT AVAILABILITY

Prelude® XL® High Recycled Content (HRC)

- Build America, Buy America (BABA) Act compliant
- Prelude® XL® High Recycled Content (HRC) suspension system is part of the Sustain Portfolio, meets stringent Sustain requirements, and contributes to improved LEED credits

COLORS

Due to printing limitations, shade may vary from actual product.

Standard

White (WH)
Black (BL)
Silver Grey (SG)
Gun Metal Grey (MY)
Silver Satin (SA)
Ivory (IV)
Medium Taupe (MT)
Adobe (AD)
Light Grey (LG)
Custom Colors Available*
Grey Stone (GS)
Stone (SE)
Basalt (SBT)
Riverstone (SRV)
Coffee (SCE)
Polar (SPO)
Limestone (SLM)
Fossil (SFL)
Sandstone (SSS)
Hay (SHY)
Oat (SOT)
Mist (SMT)
Pacific (SPC)
Rainstorm (SRS)
Lilac (SLC)
Twilight (STT)
Ocean (SOC)
Boxwood (SBW)
Fern (SFN)
Ivy (SIV)
Feldspar (SFS)
Topaz (STZ)
Bronzite (SBZ)
Honeysuckle (SHS)
Marigold (SMG)
Rose (SRO)

NOTE: 360° paint finishes and custom colors available as special order.

Premium

White Aluminum (WA)†
Natural Aluminum (NA)†
Copper (CP)
Bronze (BZ)
Pewter (PW)
Silver (SL)

Powder-Coated Finishes

Blizzard White (ZW)
Charcoal Black (ZB)

* Colors that are pre-qualified to meet Sustain™ portfolio requirements are available upon request. Other made-to-order colors must be evaluated if sustainability criteria is required. Lead time will increase.
† Prefinished aluminum capping for corrosion resistance

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Armstrong® World Industries

PRELUDE® XL® and PRELUDE XL High Recycled Content (HRC)

Exposed Tee Suspension System

SUSTAIN™ High Performance Sustainable Ceiling Systems

Declare.

LEED® | WELL™ | LBC

UP TO 63% RECYCLED CONTENT

Calculate sustainability with Ecomedes armstrongceilings.com/ecomedes

energy management	construction waste mgmt	regional materials ▲	design for flexibility	EPD	recyclable/ extended producer resp.	biobased materials	recycled content	sourcing of raw materials	material ingredient reporting	low emitting/ materials	lighting quality	acoustics
	✔	✔	✔	✔			✔	✔				

▲ LOCATION DEPENDENT

WELL Building Standard™ (WELL)
Living Building Challenge® (LBC)

VISUAL SELECTION / PERFORMANCE / PACKAGING

	Item No.◆	Description	Rout Spacing	Dimensions (Inches)	LOAD TEST DATA (LBS./LIN. FT.) L/360 4 Ft.	LOAD TEST DATA (LBS./LIN. FT.) L/360 5 Ft.	Fire Guard™	Seismic Category	CleanAssure™ Disinfectable Grid Fog	Spray	Wipe	Pieces/ Carton	LFT/ Carton
PRELUDE® XL® 15/16"	7301_ _ _ 7301HRC 8301	12' HD Main Beam	6" O.C.	144 x 15/16 x 1-11/16"	16.73	8.73	N/A N/A •	• • •	• • •	• • •	• • •	20 20 20	240 240 240
(Red Numbers are Fire Guard™ items)	7300_ _❖ 7300HRC 8300_ _ †	12' ID Main Beam	6" O.C.	144 x 15/16 x 1-11/16"	13.5	6.35	N/A •	N/A N/A	• •	• •	• •	20 20	240 240
(Blue Numbers are BABA Compliant and High Recycled Content Items)	7305_ _❖	140" HD Main Beam	10" O.C.	140 x 15/16 x 1-11/16"	16.73	8.73	N/A	•	•	•	•	20	233
	7306_ _❖	132" HD Main Beam	10", 30", 50", 56", 76", 96", 116", 122" O.C.	132 × 15/16 × 1-11/16"	16.73	8.73	N/A	•	•	•	•	20	220
	7307_ _❖	126" HD Main Beam	10", 30", 50", 70", 90", 110", 116" O.C.	126 x 15/16 x 1-11/16"	16.73	8.73	N/A	•	•	•	•	20	210
	7302_ _❖	10' ID Main Beam	6" O.C.	120 x 15/16 x 1-11/16"	13.5	6.35	N/A	N/A	•	•	•	20	200
	XL7380_ _❖	8' Cross Tee	12" O.C.	96 x 15/16 x 1-11/16"	12.12**	N/A	N/A	•	•	•	•	20	160
	XL7357_ _❖	5' Cross Tee	6", 12", 24", 30", 36", 48", 54" O.C.	60 x 15/16 x 1-11/16"	N/A	7.61	N/A	•	•	•	•	60	300
	XL7390_ _❖	6' Cross Tee	12" O.C.	72 x 15/16 x 1-11/16"	12.24*	N/A	N/A	•	•	•	•	20	120
	XL7341_ _❖ XL7341HRC XL8341	4' Cross Tee	12" O.C.	48 x 15/16 x 1-11/16"	16.89	N/A	N/A N/A •	• • •	• • •	• • •	• • •	60 60 60	240 240 240
	XL7340_ _❖ XL8340_ _ †	4' Cross Tee	12" O.C.	48 × 15/16 × 1-11/16"	12.25	N/A	N/A •	• •	• •	• •	• •	60 60	240 240
	XL7342_ _ _ XL7342HRC	4' Cross Tee	12" O.C.	48 x 15/16 x 1-1/2"	7.8	N/A	N/A	•	•	•	•	60	240
	XL7348_ _❖ XL7348HRC	4' Cross Tee	12" O.C.	48 x 15/16 x 1-3/8"	6.78	N/A	N/A	•	•	•	•	60	240
	XL7330_ _ ††	3' Cross Tee	N/A	36 x 15/16 x 1-11/16"	20.3 at 3'	N/A	N/A	•	•	•	•	60	180
	XL7378_ _❖	30" Cross Tee	N/A	30 x 15/16 x 1-3/8"	16.54 at 2.5'	N/A	N/A	•	•	•	•	60	150
	XL7328_ _ _ XL7328HRC XL8323_ _ †	2' Cross Tee	N/A	24 x 15/16 x 1-3/8"	36.0 at 2'	N/A	N/A •	• •	• •	• •	• •	60 60	120 120
	XL8320HRC XL8320 †	2' Cross Tee	N/A	24 x 15/16 x 1-11/16"	61.33 at 2'	N/A	N/A •	• •	• •	• •	• •	60 60	120 120
	XL7368_ _❖	20" Cross Tee	N/A	20 x 15/16 x 1-3/8"	36.0 at 1.67'	N/A	N/A	•	•	•	•	60	100
	XL7398_ _❖	18" Cross Tee	N/A	18 x 15/16 x 1-3/8"	N/A	N/A	N/A	•	•	•	•	60	90
	XL7318_ _❖	1' Cross Tee	N/A	12 x 15/16 x 1-3/8"	36.0 at 1'	N/A	N/A	•	•	•	•	120	120
	XL7304_ _❖	4" Cross Tee	N/A	4 x 15/16 x 1-11/16"	N/A	N/A	N/A	•	•	•	•	60	20
	XL7306_ _❖	6" Cross Tee	N/A	6 x 15/16 x 1-11/16"	N/A	N/A	N/A	•	•	•	•	60	30
Size Capabilities NOTE: Up to 6 weeks for color and size combinations.	1 Ctn Min FASTSIZE 2 WEEKS order to ship	15/16" Prelude® XL® Main Beam Length 36" – 144" Rout spacing 3" from ends, 4" thereafter	Cross Tee Length 3" – 144"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Varies	Varies

Made-to-order main beams and cross tees can be ordered with special sizes, rout spacing, and colors for your project needs in one carton minimums.
NOTE: Additional Prelude XL items for TechZone® Ceiling Systems are listed in the TechZone Technical Guide (BPCS-4486), and available online at armstrongceilings.com/techzone

* Simple Span ** Hanger Wire Support Mid-Span

◆ When specifying or ordering items with a color or finish, add the two-or three-letter suffix to the end of the item number (e.g. XL7342 L G _ – Light Grey)

❖ Available in White (WH), and Blizzard White (ZW) and Charcoal Black (ZB) powder-coated finishes only

† Available in Black (BL) and White (WH) only

†† Available in Black (BL), White (WH), and Blizzard White (ZW) and Charcoal Black (ZB) powder-coated finishes only

Dots represent high level of performance.

VISUAL SELECTION / PACKAGING

	Item No.◆◆	Face Profile	Description	Dimensions (Inches)	CleanAssure™ Disinfectable Grid 4 Ft.	5 Ft.	Pieces/ Carton	LFT/ Carton
Prelude XL Painted Grid to Match Axiom® Trim (360° Painted – Powder Coated Paint)	AX73013_ _ _	15/16"	12' HD Main Beam, Routs 6" O.C.	144 × 15/16 × 1-11/16"	16.73	8.73	20	240
	AX73423_ _ _	15/16"	4' Cross Tee, Routs 12" O.C.	48 × 15/16 × 1-1/2"	7.8	N/A	60	240
	AX73283_ _ _	15/16"	2' Cross Tee	24 × 15/16 × 1-3/8"	36.0 @ 2'	N/A	60	120

◆◆ When specifying or ordering items with a color or finish, add the two-or three-letter suffix to the end of the item number (e.g. 7301 L G _ – Light Grey)

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Armstrong® World Industries

SUSPENSION SYSTEMS – Standard

PRELUDE® XL® and PRELUDE XL High Recycled Content (HRC)

Exposed Tee Suspension System

SUSTAIN™ High Performance Sustainable Ceiling Systems

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LEED® WELL™ LBC

UP TO 63% RECYCLED CONTENT

Calculate sustainability with Ecomedes armstrongceilings.com/ecomedes

energy management; construction waste mgmt; regional materials; design for flexibility; EPD; recyclable/ reusable/ producer resp.; biobased materials; recycled content; sourcing of raw materials; material ingredient reporting; low emitting/ materials; lighting quality; acoustics

▲ LOCATION DEPENDENT

WELL Building Standard™ (WELL) Living Building Challenge® (LBC)

SUSPENSION SYSTEMS – Standard

VISUAL SELECTION

PERFORMANCE

PACKAGING

	Item No.	Face Profile	Description	Rout Spacing	Dimensions (Inches)	LOAD TEST DATA (LBS/LF) L/360 4 Ft.	LOAD TEST DATA (LBS/LF) L/360 5 Ft.	Fire Guard™	Seismic Category	CleanAssure™ Disinfectable Grid: Fog	Spray	Wipe	Pieces/ Carton	LF/ Carton
Continuous Load Path (CLP)	**CLP7301**	15/16"	N/A	N/A	6 × 15/16"	N/A	N/A	N/A	•	•	•	•	20	240
	7396	15/16"	9' 6" Main Beam	6" O.C.	114 x 15/16"	16.5	8.73	N/A	•	•	•	•	20	190
	7376	15/16"	7' 6" Main Beam	6" O.C.	90 x 15/16"	16.5	8.73	N/A	•	•	•	•	20	150

Dots represent high level of performance.

ASTM Class
HD - Heavy-duty
ID - Intermediate-duty
LD - Light-duty

VISUAL SELECTION

PACKAGING

	Item No.◆	Description	Length	(A) Flange	(B) Flange	(C) Reveal	(D) Reveal	Pieces/ Carton	LFT/ Carton
Suggested Wall Moldings and Shadow Moldings (Blue Numbers are BABA Compliant and High Recycled Content Items)	**7800_ _ _**† **7800HRC**	12' Hemmed Angle Molding	144"	7/8"	7/8"	N/A	N/A	30	360
	7808_ _❖	10' Hemmed Angle Molding	120"	2"	2"	N/A	N/A	10	100
	780812_ _❖	12' Hemmed Angle Molding	144"	2"	2"	N/A	N/A	10	120
	7807	10' Hemmed Angle Molding	120"	2"	1"	N/A	N/A	10	100
	7875_ _❖	10' Shadow Molding	120"	3/4"	15/16"	1/2"	N/A	30	300
	7877_ _❖***	10' Shadow Molding	120"	15/16"	15/16"	1/4"	N/A	30	300
	7878_ _ _***†	10' Shadow Molding	120"	15/16"	15/16"	3/8"	N/A	30	300
	7897_ _❖***	10' Shadow Molding	120"	15/16"	15/16"	1/2"	N/A	30	300
	7888	10' Shadow Molding	120"	15/16"	15/16"	3/8"	1/4"	30	300
	7850_ _❖	12' Hemmed Angle Molding	144"	1-1/8"	7/8"	N/A	N/A	30	360

*** Suitable for IBC Category D,E,F installations using Armstrong® Seismic Rx® suspension system and BERC2 Clip
◆ When specifying or ordering items with a color or finish, add the two-or three-letter suffix to the end of the item number (e.g. XL7342 L G _ – Light Grey)
❖ Available in White (WH), and Blizzard White (ZW) and Charcoal Black (ZB) powder-coated finishes only
† Not available in Silver Grey (SG), Gun Metal Grey (MY), or Silver Satin (SA).
†† Available in White (WH), Black (BL), Silver Grey (SG), Silver Satin (SA), and Blizzard White (ZW) and Charcoal Black (ZB) powder-coated finishes only

MAXIMUM FIXTURE WEIGHT

Drawing Key: Main beam (↑) Cross tee (---) Hanger wire (+)

	Configuration A	Configuration B	Item No.	Fixture A	Fixture B	Planning Module A	Planning Module B	Hanger Spacing A	Hanger Spacing B	Maximum Weight A	Maximum Weight B
Main Beam to Main Beam			**7300/8300/7302 7301/8301**	24" × 48" 24" × 48"	24" × 48" 24" × 48"	48" × 48" 48" × 48"	48" × 48" 48" × 48"	48" 48"	48" 48"	69.27 lbs. 72.32 lbs.	49.27 lbs. 72.32 lbs.
			**7300/8300/7302 7301/8301**	12" × 48" 12" × 48"	12" × 48" 12" × 48"	48" × 48" 48" × 48"	48" × 48" 48" × 48"	48" 48"	48" 48"	54.26 lbs. 100.0 lbs.	47.17 lbs. 63.32 lbs.
			**7300/8300/7305 7301/8301**	24" × 48" 24" × 48"	20" × 60" 20" × 60"	60" × 60" 60" × 60"	60" × 60" 60" × 60"	48" 48"	48" 48"	56.47 lbs. 56.47 lbs.	43.21 lbs. 65.46 lbs.

Main beams tested as follows: 7300 tested at 13.0 lbs./LF to 1/360 of 4' span; 7301 tested at 16.5 lbs./LF to 1/360 of 4' span; 8500 tested at 13.3 lbs./lin. ft. to 1/360 of 4' span. 48" cross tee tested at 10.34 lbs./lin. ft. to 1/360 of 4' span.

Cross Tee to Cross Tee			**XL8340/XL7340 XL7342 XL8341/XL7341**	24" × 48" 24" × 48"	24" × 24" 24" × 24"	64" × 60" 64" × 60"	48" × 48" 48" × 48"	48" 48"	48" 48"	69.27 lbs. 40.89 lbs.	80.55 lbs. 52.26 lbs.
			**XL8340/XL7340 XL8341/XL7341**	24" × 48" 24" × 48"	12" × 48" 12" × 48"	48" × 48" 48" × 48"	48" × 48" 48" × 48"	48" 48"	48" 48"	49.27 lbs. 72.32 lbs.	42.17 lbs. 63.32 lbs.

Fixtures weighing more than 56 lbs. should be independently supported. Fixture weight is based on single fixture only. For end-to-end fixtures or other configurations not shown, consult your Armstrong Ceilings representative.

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armstrongceilings.com/preludexl

Armstrong® World Industries

PRELUDE® XL® and PRELUDE XL High Recycled Content (HRC)

Exposed Tee Suspension System

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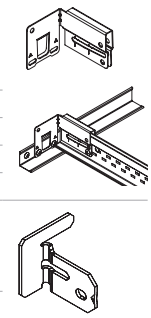
energy management ✓ | construction waste mgmt ✓ | regional materials ✓ | design for flexibility ✓ | EPD ✓ | recyclable/ extended producer resp. | biobased materials | recycled content ✓ | sourcing of raw materials ✓ | material ingredient reporting | low emitting/ materials | lighting quality | acoustics

▲ LOCATION DEPENDENT

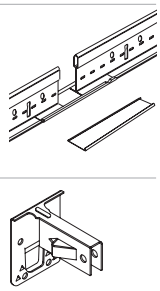
WELL Building Standard™ (WELL) Living Building Challenge® (LBC)

ACCESSORIES

Item No.	Description	Pieces/ Carton
BERC2	**2" Beam-End Retaining Clip** Allows you to create a code-compliant Seismic D, E, F ceiling installation while eliminating the need to use 2" wall molding or spreader bars.	
BERC2	Steel	200
FZBERC2	Steel	50
ALBERC2	Aluminum	200
FZALBERC2	Aluminum	50
STAC	**Single-Tee Adapter Clip** Used to create code-compliant non-seismic and seismic C and D, E, F off-module main beam to cross tee connections.	
STAC		120
FZSTAC		50



Item No.	Description	Pieces/ Carton
ES4	**Expansion Sleeves** For 15/16" Prelude	
ES4		200
FZES4		50
GCWA	**Grip Clip Wall Attachment** Joins main beam or cross tee to wall molding via locking barbs without pop rivets or screws.	
GCWA		250
FZGCWA		50

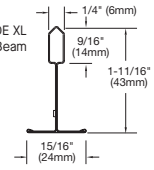


DETAILS

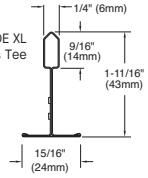
PRELUDE® XL® Main Beam

PRELUDE XL Cross Tee

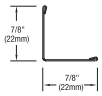
PRELUDE XL Main Beam



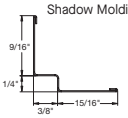
PRELUDE XL Cross Tee



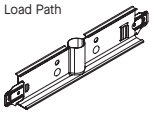
7/8" Hemmed Angle Molding



15/16" Hemmed Shadow Molding



Continuous Load Path



CLP7301 – 20 pcs

SEISMIC PERFORMANCE

Main Beams
7301, 7301HRC, 7306, 7307, 8301

Minimum Lbs. To Pull Out Compression/Tension
335.0
330.0

Cross Tees
All XL cross tees exceed 300 lbs. in both compression and tension.

ICC Reports
For areas under ICC jurisdiction, see ICC evaluation report number ESR-1308 for allowable values and/or conditions of use concerning the suspension system components listed on this page. The report is subject to re-examination, revisions, and possible cancellation.

PHYSICAL DATA

Material
G30 hot-dipped galvanized steel

Surface Finish
Baked polyester paint or powder coated
Manufactured and tested in accordance with ASTM C635

Face Dimension
15/16"

Profile
Exposed tee

Cross Tee/Main Beam Interface
Override

Design Considerations
Physical product samples for standard and custom colors are available upon request. Please refer to the physical product sample prior to making a final selection. While we strive to ensure exact color matches, various factors such as differences in materials, texture, substrate porosity, painting processes, lighting, and observer subjectivity can all affect how paint colors appear on ceiling and wall panels, suspension systems, and trim products. Due to these and other differences, ceiling and wall panels, trim products, and suspension systems with the same color name will coordinate but may not be an exact color match. Product is dye-lotted. Order sufficient initial quantities and attic stock to minimize possible color variation.

All acoustical grid and Axiom trim accessories (a.k.a. clips) are supplied as unpainted items. Exposed clips will need to be field painted after installation, if required for the project. This ensures accessories meet the tested performance criteria and adhere to AWI installation instructions and warrantied products or systems.

Installation Consideration
If pop riveting must be used on powder coated material, pre-drill with a sharp 1/8" drill bit to minimize potential paint chipping.

End Detail
Main Beam: Staked-on clip
Cross Tee: Staked-on clip

Duty Classification
Intermediate or Heavy-duty

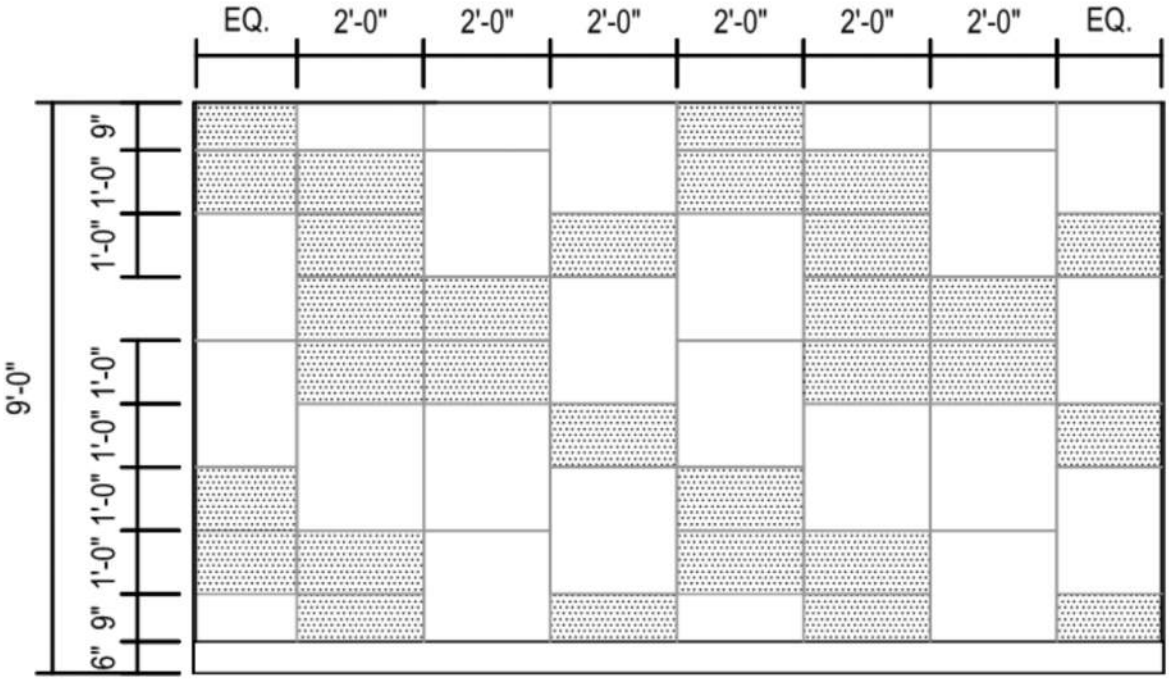
Cleaning & Disinfecting
Cleaning and CDC-approved disinfecting options available on armstrongceilings.com/cleaning

TechLine / 1 877 276-7876
armstrongceilings.com/preludexl

BPCS-3344-125

Armstrong® World Industries

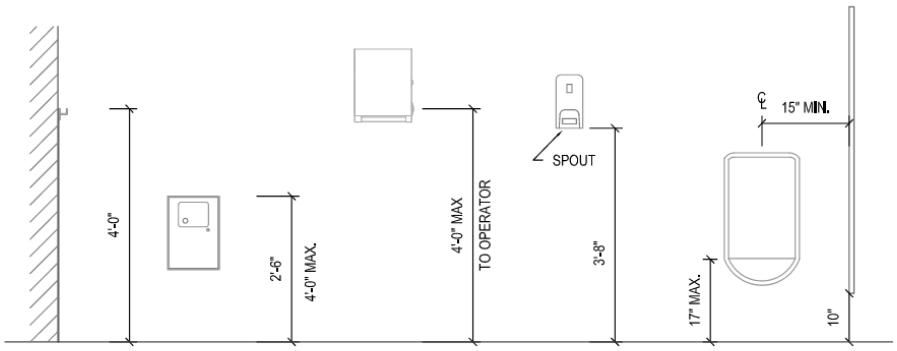
SUSPENSION SYSTEMS – Standard



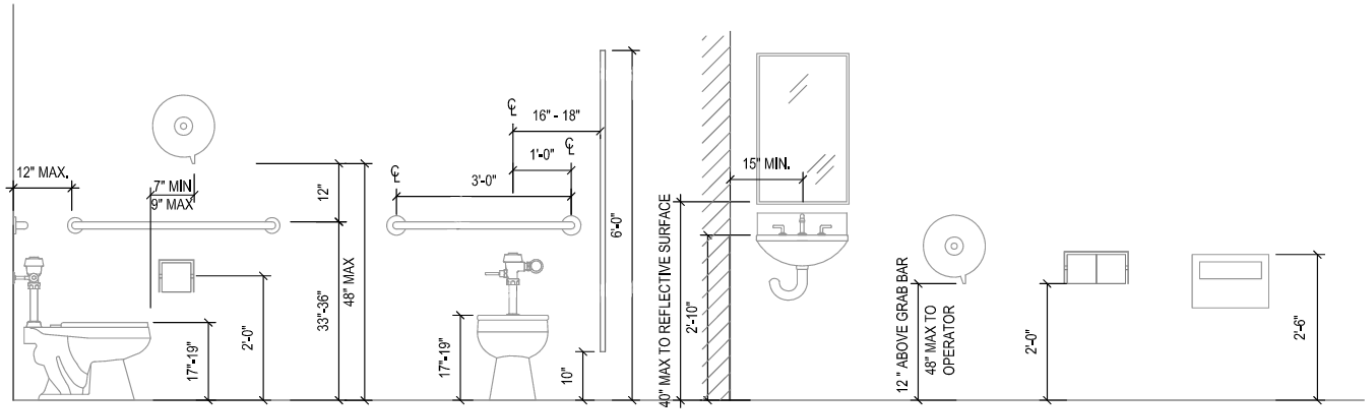
WALL TILE LAYOUT ELEVATION

1. Wall Tile (Basis of Design)
   a. Pattern: PT 3115 by MOSA USA Porcelain Tile
   b. Basis of Design: Daltile
   c. Product Line: Medium/ Colorbody Porcelain
   d. Sizes:
      i. CT-1 (light color): 24"x24"
      ii. CT-2 (darker color): 12"x24"
   e. Colors:
      i. CT-1: Light Gray MN43, Polished with 1/16" joint spacing
      ii. CT-2: Gray MN 44, Polished with 1/16" joint spacing
   f. Install Schluter Schiene transition strip between the top of the epoxy floor base and the bottom of the wall tile. Finish shall be satin anodized aluminum.
   g. All inside corners to utilize Schluter DILEX-EKE corner movement joint product. As an alternate, the corner joint can be filled with a color matched silicone sealant. This option requires a clean corner joint, void of any grout.
   h. All outside corners to utilize aluminum Schluter QUADEC (square) or RONDEC (rounded) transition strip. Color and profile to be selected by architect/owner.
2. Floors (Basis of Design)
   a. Manufacturer: Dura-A-Flex
   b. Product Line: Hybir-Flex EQ
   c. Color: Macro Chip Color Blends - Cobalt
   d. Return epoxy 6" high integral base.
   e. Install Schluter SCHIENE transition strip between top of epoxy base and bottom of wall tile. Finish shall be satin anodized aluminum.
   f. Transition strip @ doors - PEMKO aluminum - Saddle 175A. Threshold shall be installed in bed of sealant to retain water within restroom in the event of a leak.

3. Toilet Partitions (Basis of Design)
   a. Manufacturer: Scranton Products "Hiny Hiders" Solid HDPE with homogeneous color.
   b. Texture: Standard Orange Peel
   c. Color: Standard color palette - Charcoal Gray
   d. Urinal Screens: Provide double ear 54" continuous aluminum bracket for urinals, single ear for partitions adjacent to obstruections (i.e. sinks) to avoid conflicts (mount on the urinal side). Use Type "A" wall hung.
   e. Toilet Partitions: Provide double ear 54" continuous aluminum bracket for attachment to wall in lieu of stirrup brackets.
   f. Toilet Partition Doors: Provide continuous aluminum strike, full height of door.
   g. CM to field verify all dimensions.
   h. Architect to verify all dimensions for code/ADA compliance.
   i. Use fasteners appropriate for substrate, and for the headrail brace (sex bolt).
   j. Remove all layout markings from all materials and surfaces.
4. Ceiling:
   a. Armstrong Ultima Health Zone Lay-in Acoustical ceiling tile
   b. 24" X 24" Lay-In White
   c. NRC 0.70
   d. CAC 38.
5. Toilet Accessories:
   a. Hands-Free Soap Dispenser: Provided by owner, installed by contractor. See Appendix 10 02.
   b. Sanitary Napkin Disposal: Bobrick B-254
   c. Mirrors: Bobrick B-2908 1830
   d. Paper Towel Dispenser: Provided by owner, installed by contractor. See Appendix 10 02.
   e. Grab Bars: Bobrick B-6806 Series
   f. Toilet Paper Dispenser: Provided by owner, installed by contractor.
   g. Toilet Seat Cover Dispenser: Bobrick B-221, installed by contractor.
   h. Baby Change Station: Koala Kare KB110-SSWM
   i. Trash Receptacles: Provided by owner. Do not use semi-recessed wall mounted trash receptacles.
   j. Door Hook: Bobrick B-682 Series. Mounted 48" AFF. Provide in each toilet room and stall. Locate on the back side of doors.
6. Plumbing Fixtures and Accessories:
   a. Sink: American Standard / 6690.001 "Mezzo". Semi-countertop, 19" x 15", single faucet hole. Battery operated faucet.
   b. Toilet: Sloan / ST-2029. Floor mounted siphon jet, top spud, elongated bowl, 1.6 gallons per flush. Battery operated flush valve.
   c. Urinal: Sloan / SU-1009. Wall mounted washout urinal, top spud, 0.5 gallons per flush. Flush volume determined by the flushometer used with the fixture
   d. Custodial Mop Sink: Fiat / SB2424. 24" X 24" x 12" terrazzo mop sink with 3" stainless steel drain body, dome strainer and lint basket.
   e. Notes:
      i. Floor drain(s) are required in every restroom.
      ii. Verify all toilet accessories with Broward College representative prior to purchase.
      iii. Verify location of all toilet accessories with Broward College representative prior to installation.



TOWEL AND ROBE HOOK | SANITARY NAPKIN DISPOSAL AT ALL FEMALE TOILET STALLS | PAPER TOWEL DISPENSER | HANDS FREE SOAP DISPENSER OVER COUNTER | URINAL WITH 24" DEEP PARTITION, WHERE OCCURS



WATER CLOSET WITH TOILET PAPER HOLDER | WATER CLOSET WALL OR PARTITION, WHERE OCCURS | LAVATORY & MIRROR | TOILET TISSUE HOLDER AT ALL TOILET STALLS | TOILET TISSUE HOLDER AT ALL TOILET STALLS | SEAT COVER DISPENSER OR AS INDICATED

DUR-A-FLEX
INNOVATION FROM THE FLOOR UP

MACRO CHIP COLOR BLENDS


WHEAT


MARINA


OYSTER SHELL


PEWTER


COBBLESTONE


SCARLET


COBALT


CALYPSO


GLACIER

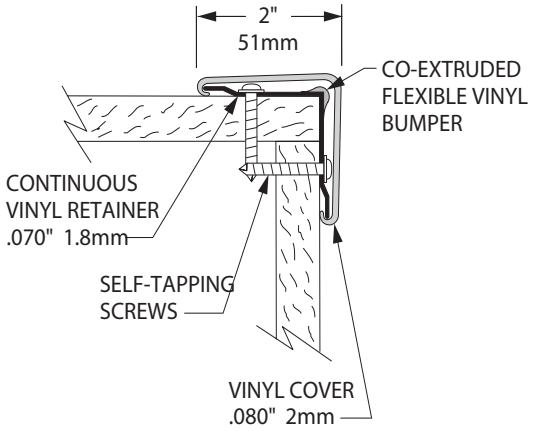
The samples shown are only close approximations and should not be used for specification purposes.
Contact Dur-A-Flex to obtain actual samples for best color selection.

3/18

CONNECTICUT | GEORGIA | ILLINOIS | CALIFORNIA | Tel: 860.528.9838 | Fax: 860.528.2802 | www.Dur-A-Flex.com

160BN BluNose High Impact

Corner Guard



Options

- Available in all Standard Inpro Solid Colors
- Available in select Standard Inpro Woodgrains*
- Available in selected Standard Inpro Metallics*

**Reference Inpro Door + Wall Color Guide for More Information*

Product Details

- 2" wing (51mm) with 90˚ corner protection
- Mounted on a .070" (1.8mm) thick continuous vinyl retainer with a co-extruded Biopolymer Flex PVC apex
- Vinyl retainer is four times stronger than our aluminum retainer and six times stronger than any other vinyl retainer
- .080" (2mm) thick scratch and stain resistant rigid vinyl cover
- Manufactured in 4' (1.22m), 8' (2.44m), 9' (2.74m) and 12' (3.66m) standard heights, custom heights available
- Quick Ship applies to 4' (1.22m) and 8' (2.44m) heights and select colors only

Testing & Certification

- UL-723 (ASTM E-84) Class A Classified
- ASTM G-21 and ASTM G-22 Tested does not support fungal or bacterial growth
- Self Extinguishing: Tested in accordance with the procedures specified in ASTM D-635-74
- Resistance to stain when tested in accordance with applicable provisions of ASTM D-543
- Impact Strength of 30.2 ft-lbs/inch of thickness tested in accordance with the procedures specified in ASTM D-256
- Impact Resistance: Tested in accordance with applicable provisions of ASTM F 476-84
- Meets UL GREENGUARD Gold low-VOC emission standards. UL GREENGUARD Gold Certification ensures that products are acceptable for use in places such as schools and healthcare facilities, and that they comply with CDPH Standards.

IPC.3688/REV.11

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World Headquarters S80 W18766 Apollo Drive, Muskego, WI 53150 USA

Installation Instructions

BluNose™ High Impact Corner Guards
Models: 150BN, 160BN, 170BN, 130BN

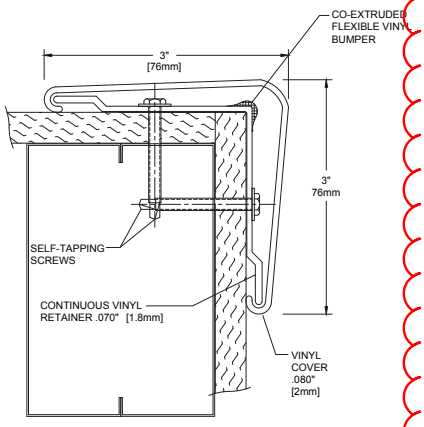
Please read all instructions before installing corner guard.

Important

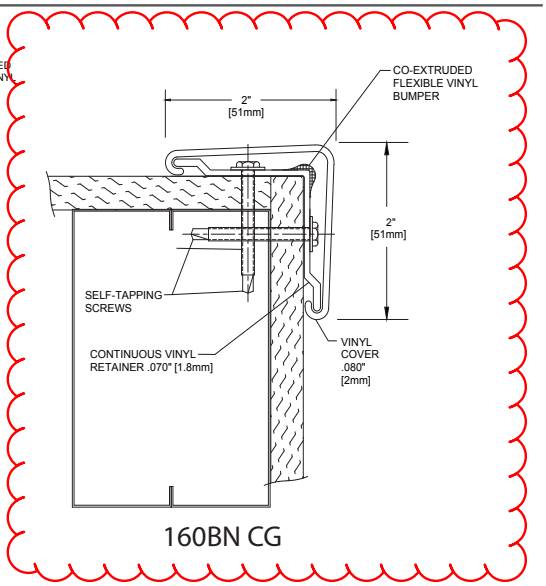
1. Acclimate materials 24 hrs before installation. Maintain temperature controlled environment after installation
2. Install in accordance with manufacturer's installation instructions. Failure to do so will void the warranty.

Installation tips

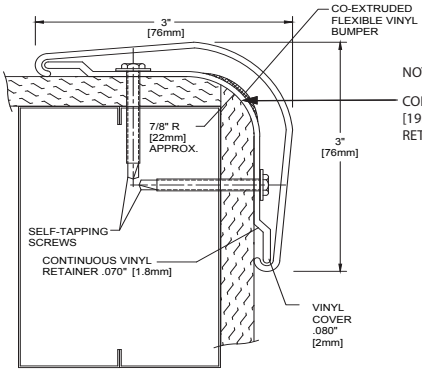
1. Cut covers up to 1/16" (1.6mm) longer to ensure a tight fit.



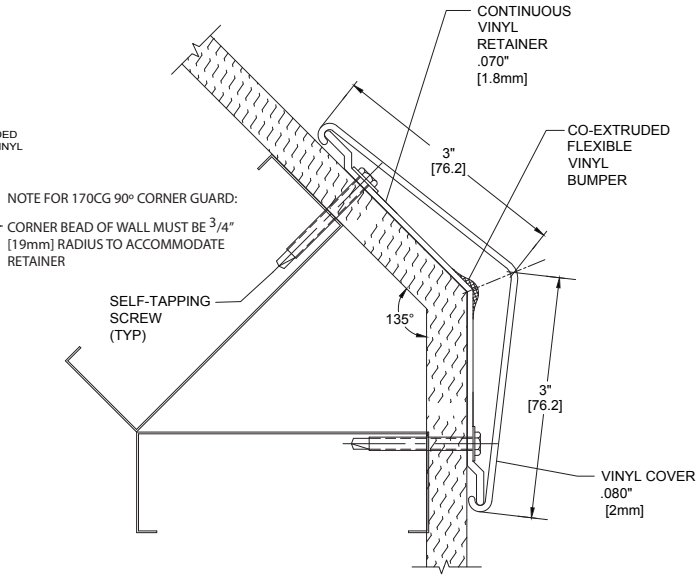
150BN CG



160BN CG



170BN CG



130BN CG

SECTION VIEWS

Recommended tools

Safety Glasses, Tape Measure, Level, Power Drill, 1/4" Socket, Drill Bits - 1/4" masonry (concrete/concrete block), Power Miter Saw, 10" Blade with 60-80 Carbide Tipped Teeth

IPC.381/REV.5

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Installation Hotline: 866.394.6776

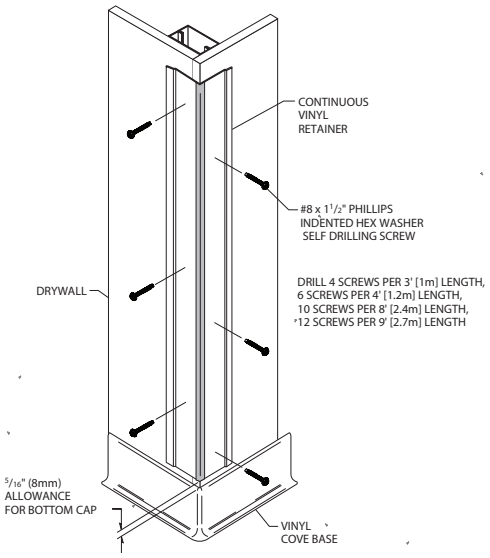
Installation Instructions

BluNose High Impact Corner Guards

Models: 150BN, 160BN, 170BN, 130BN

Please read all instructions before installing corner guard.

FIG. 1



Please read all instructions before installing corner guards.

Material must be stored, installed and used in environmentally controlled conditions.

1. Position vinyl retainer against wall, leaving allowance for bottom cap. Secure retainer to the wall by staggering fasteners on each wing of the retainer. See Figure 1.

Note for concrete installation: Use the slotted tabs on the top and bottom caps to transfer and drill 1/4" (6.5mm) holes into the ends of the retainer. Also drill 1/4" (6.5mm) holes staggered on each wing of the retainer. Drill 4 holes per 3' (.91m) length, 6 holes per 4' (1.22m) length, 10 holes per 8' (2.44m) length or 12 holes per 9' (2.74m) length. Transfer the location of the mounting holes to the wall. Drill marked holes on wall using a 1/4" (6mm) drill bit and position Alligator anchors into holes. Mount retainer on wall with #10 x 1 3/4" phillips pan head screws and tighten to secure.

Note for 170BN Blunose 90˚ Bullnose Corner Guard: Corner bead of wall must be 3/4" (19mm) radius to accommodate retainer.

2. Overlap the retainer with the mounting tabs of the top and bottom caps and attach them to retainer. Stagger the fasteners on each wing of the cap. See Figure 2.

When installing flexible top caps on custom angle corner guards, use cup washers and flat head screws to fasten the top caps to the retainer. See Figure 2a.

Note for concrete installation: Overlap the retainer with the mounting tabs of the top and bottom caps and attach them to retainer and into the Alligator anchors using two, #8 x 1 1/2" phillips flat head screws per cap.

FIG. 2

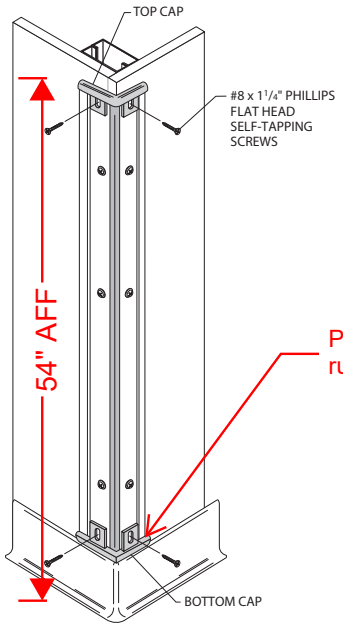
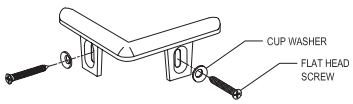


FIG. 2a



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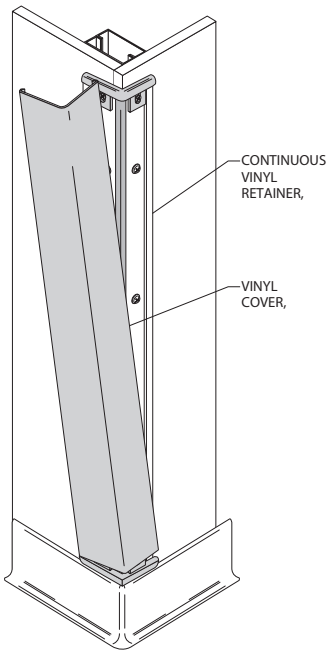
Installation Instructions

BluNose High Impact Corner Guards

Models: 150BN, 160BN, 170BN, 130BN

Please read all instructions before installing corner guard.

FIG. 3



3. Position cover on retainer and adjust the top cap for a tight fit. Starting at the top, push cover onto retainer pressing over the entire length until it snaps into place. See Figure 3.

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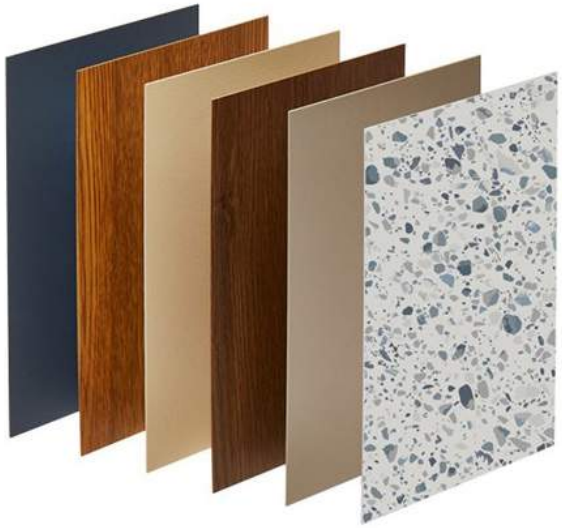
Installation Hotline: 866.394.6776

1. For inside classrooms, except accent walls and walls with whiteboards. Please coordinate with BC.

Palladium® Rigid Vinyl Sheet

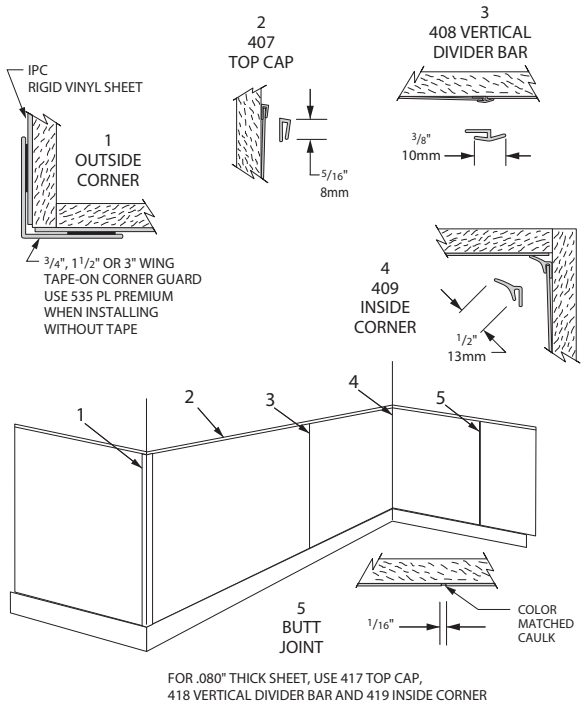


Product Details

- Provides reliable wall protection and is durable, long lasting and easy to clean
- Available in standard 3' (.91m) and 4' (1.22m) widths and 8' (2.44m) lengths. Custom lengths and rolls up to 120' (36m) available
- Standard thicknesses of .030 (.8mm), .040 (1mm) & .060 (1.5mm), .080 (2mm) thickness also available

Options

- Available in Inpro Solid Colors, Wood Grains, and Patterns. See inpro.com for complete finish selection
- Vinyl, Aluminum and Stainless Steal trim accessories available



Testing & Certification

- Scratch and stain resistant rigid vinyl
- UL-723 (ASTM E-84) Class A Classified
- Self Extinguishing: Tested in accordance with the procedures specified in ASTM D-635-74
- Impact Strength: Tested in accordance with the procedures specified in ASTM D-256
- In compliance with article 15, part 1120 of the New York State uniform fire prevention and building code. DOS # 09960-930.504.4001
- ASTM G-21 and ASTM G-22 Tested does not support fungal or bacterial growth
- Meets UL GREENGUARD Gold low-VOC emission standards. UL GREENGUARD Gold Certification ensures that products are acceptable for use in places such as schools and healthcare facilities, and that they comply with CDPH Standards.

ASTM INTERNATIONAL

IPC.3725/REV.26

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Installation Instructions

Palladium® Rigid Sheet/Rubrail or Palladium® G2 Sheet/Rubrail

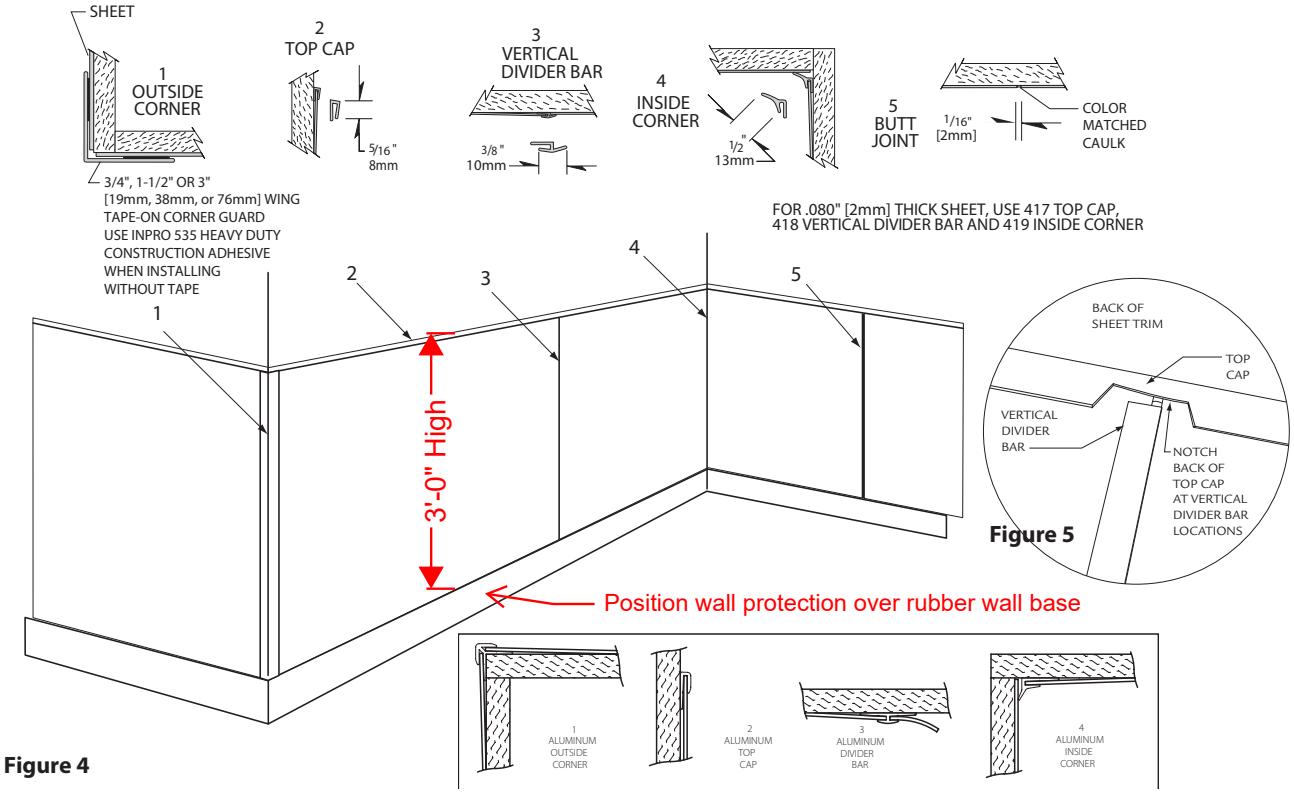

Figure 4

Figure 5

Color Matched Caulk

Use Color Matched Caulk to fill in the joints between sheets. Apply masking tape along both edges of the joint. Cut the spout on the tube at a 45° angle. Apply the color matched caulk to the joint. With a putty knife or finger, remove excess caulk from the joint. Immediately after applying the caulk remove the painters tape. If sinking occurs, reapply Color Matched Caulk following the same steps. Remove unwanted caulk, before it cures, with a water dampened cloth.

- Apply masking tape on the edges of the joint.
- Apply caulk to joint and remove excess with putty knife.
- Remove painters tape before caulk cures.
- Repeat caulk application if sinking occurs.
- Remove unwanted caulk before it cures.

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APPENDIX 10 02 | PAPER AND SOAP DISPENSER

Please consult with Broward College's Project Manager for paper and soap dispenser equipment. Custodial vendor will vary per campus.

1. Soap Dispenser

2. Paper Dispenser

ThermoVeil®

1% open
1700 series

3% open
1500 series

5% open
1300 series

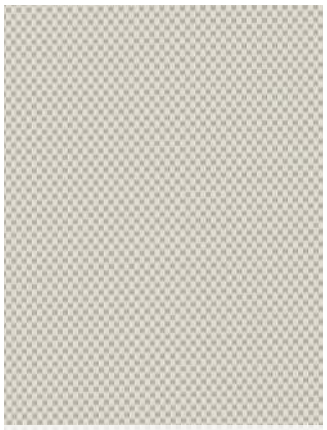
10% open
2100 series

This series is composed of a technically advanced material woven in a 2 x 2 basket-weave pattern. Its weave provides a uniform scrim effect at the window wall with an appropriate density for sun control.

Fire Classification | NFPA 701
Railroading Available | Yes
Bacteria & Fungal Resistance | ASTM G21 & ASTM E2180
Stocked Width | 126"

order free swatches &
up-to-date shade cloth information

White
1701 | 1501 | 1301 | 2101



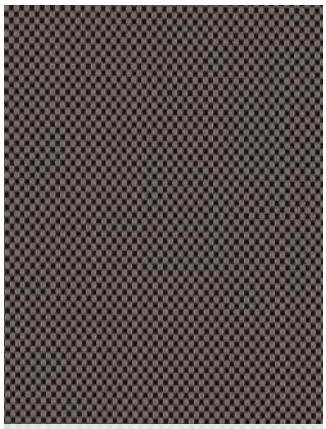
Silver Birch
1719 | 1519 | 1319 | 2119

Eggshell
1716 | 1516 | 1316

Beige
1702 | 1502 | 1302

Grey
1713 | 1513 | 1313 | 2113

Taupe
1724 | 1524 | 1324



Shadow Grey
1720 | 1520 | 1320

Black/Brown
1704 | 1504 | 1304

NFPA 701

Mecho

RETRO ELEVATOR
MOVE UP

Broward College

Ceiling
Satin Stainless steel with 6 LED fixtures.

Wall Panels
Upper insets Formica 9285-58 laminate and lower insets Rigidized metals 3FL textured metal, all Rail and stiles to be satin finish stainless steel. All panels to be mounted using z-clips to permit future removal.

Reveals
Satin finish stainless steel, recessed reveals between all panels

Handrails
Satin Finish Stainless steel, Tubular, ends capped, all walls.

Base
Achieved through lower punched concealed cab shell

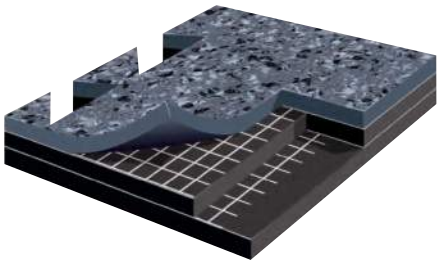
Flooring
Gerflor
GTI Max
0266 Peler
Size: 23.62" x 23.62"

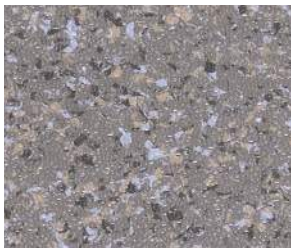
RETRO ELEVATOR
MOVE UP
Toll Free (888) 333-5434 (727) 895-8144
www.retroelevator.com

GTI MAX

Compact	Removable	R10	PUR+	♻ 100% Recyclable	FloorScore®

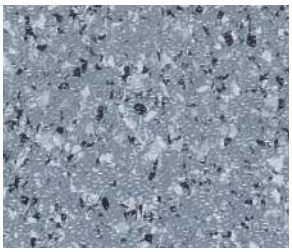
GTI MAX is a ¼" (6 mm) thick, colored, multilayered, interlocking looselay vinyl tile that features dovetail joints, making it ideal for very heavy traffic areas in manufacturing, warehouse, or retail applications where forklift traffic is common. Its product construction includes a 0.08" (2 mm) thick colored wearlayer with patented oblong fillers, reinforced with an interlayer and multiple fiberglass grids on both sides of the interlayer, on a very thick 0.08" (2 mm) vinyl sheet backing. Our PUR+ polyurethane surface treatment provides easy maintenance and improved resistance to static and dynamic loads. GTI MAX is 100% recyclable. Available in GTI Connect and GTI Control.



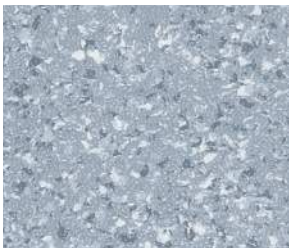


0247 MAGMA

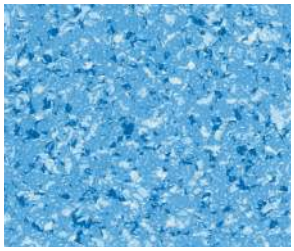
0249 CARBON



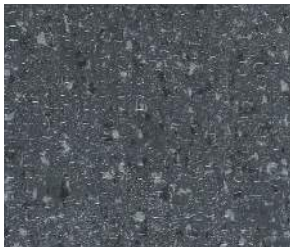
0252 TITANIUM



0253 ALUMINUM



0255 SAPHIR



0260 ORA

0264 PONENTE

0265 MAESTRALE

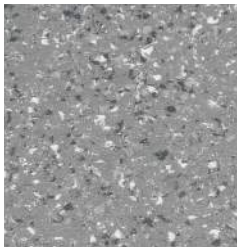
Please see the Gerflor USA catalog for additional GTI products and accessories

samples@gerflorusa.com 877.437.3567 www.gerflorusa.com

Gerflor
theflooringgroup

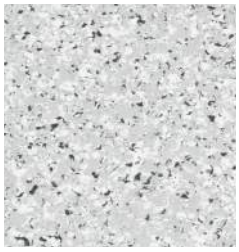
GTI MAX

Compact	Removable	R10	PUR+	♻ 100% Recyclable	FloorScore®

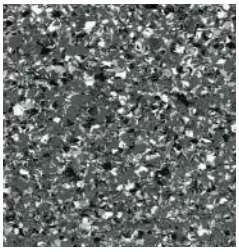


0266 PELER

0267 LEVANTE



0268 ERMELLINO

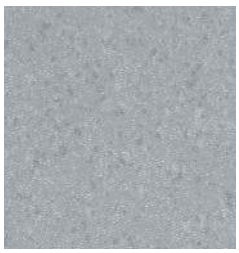


1249 TRAMONTANA

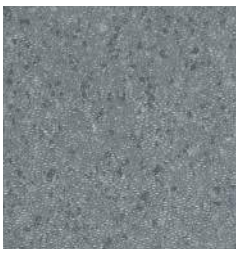
0230 BLUE

0232 RED

0233 GREEN



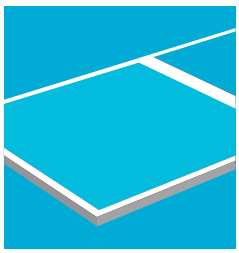
0234 CLEAR GREY



0235 DARK GREY

0236 BLACK

GTI CONNECT
Standard with interlocking tiles for fast and easy renovation



GTI CLEANTECH
Available on request for applications that require heat-welded seams

samples@gerflorusa.com 877.437.3567 www.gerflorusa.com

GTI MAX

Compact	Removable	R10	PUR+	♻ 100% Recyclable	FloorScore®

DESCRIPTION	STANDARDS	REQUIREMENTS	GTI CONNECT AND CLEANTECH
PRODUCT DESCRIPTION			GTI Connect is a Unique Multilayered Dovetailed tile (CleanTech is Straight Edge) Ideal for Quick Reovation Over Existing Floor such as VCT
Surface treatment	-	-	Pur +
Wearlayer Description	-	-	0.08" (2mm) 100% Pure Colored Homogeneous Layer
Total Thickness	ASTM F386	-	¼" (6mm)
Wearlayer Thickness	-	-	0.08" (2mm)
Tile Size	-	-	Connect: 25'' x 25'' (635mm x 635mm) / CleanTech: 23.6'' X 23.6'' (600mm x 600mm)
Weight	EN 430	-	1.92 lbs/ sqf (9365g/m2)
PERFORMANCE			
Static Load (250 psi)	ASTM F970	⩽0.005"	-0.001'' Meets Requirements
Rolling Loads	ASTM F2753	500 cycles @ 100lbs	0.000'' Excellent, No Change
Indentation Hardness	ASTM D2240	-	95
Castor Chair Test	ISO 4918 (EN 425)	-	OK
Slip Resistance	DIN 51 130	Class	R10
Coefficient of Friction	ASTM D2047	-	0.80 (Dry)
Chemical Stain Resistance	ASTM F925	-	Excellent, Results Upon Request
Fire Rating	ASTM E648	Class 1	Meets Class 1
Smoke Density (Flaming and non Flaming)	ASTM E662	-	Meets Requirements
ENVIRONMENT HEALTH & SAFETY			
Plant Certifications	ISO 14001, ISO 9001	-	Certified
Production Waste	-	-	100% Manufacturing Waste Recycled
Allergen-Free	-	-	100% Allergen-Free
MATERIALS & RESOURCES (MR): BUILDING PRODUCT DISCLOSURE & OPTIMIZATION (BPDO)			
Sourcing of Raw Materials: Recycled Content	LEED v3 MR c4 & v4 MR BPDO	Contributes	55%
Sourcing of Raw Materials: Restriction Use of Harmful Chemicals	LEED v4 MR BPDO	Contributes	100% REACH Compliant
INDOOR ENVIRONMENTAL QUALITY (IEQ)			
Low Emitting Materials	LEED v3 IEQ c4.3 / LEED v4 IEQ	Contributes	FloorScore® Certified
TVOC After 28 Days	ISO 16000-6	-	< 100 µg/m³
WARRANTY	**10-year limited manufacturer warranty when installed in accordance with Gerflor's installation instructions on www.gerflorusa.com**		

*The best defense against the spread of infections is the implementation of an effective cleaning method.

NO heavy metals, CMR 1, or CMR 2

100% Recyclable

samples@gerflorusa.com 877.437.3567 www.gerflorusa.com

APPENDIX 22 01 | WATER FOUNTAIN INSTALLATION GUIDE
BUILDING CODE ADVISORY FOR DRINKING FOUNTAINS (BASED ON FBCP 2020)

Originating Office: Facilities Management

Items for Consideration:

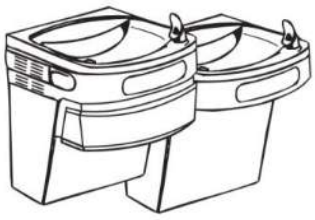
1. Typical BC Building Occupancy Type: Business
2. See FBCP 2023 Table 403.1 for quantity of drinking fountains required in Business Occupancy. Other occupancies such as labs, gymnasiums, etc. will have different requirements. Reference Life Safety Documents for analysis.
3. Per Section 410.3:
   a. Where drinking fountains are required, not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.
   b. Exceptions:
      i. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
4. Water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required drinking fountains. (FBCP 410.4)
5. For ADA – Spout cannot be higher than 36" measured from finish floor elevation to spout outlet (FBCA 602.4)
6. Drinking Fountains for Standing Persons shall be between 38" & 43" (FBC 602.7)
7. Water flow must be 4" high minimum, and 5" max. distance from front of the unit (FBCA 602.6 Water Flow). The spout shall provide a flow of water 4 inches (100 mm) high minimum and shall be located 5 inches (125 mm) maximum from the front of the unit. The angle of the water stream shall be measured horizontally relative to the front face of the unit. Where spouts are located less than 3 inches (75 mm) of the front of the unit, the angle of the water stream shall be 30 degrees maximum. Where spouts are located between 3 inches (75 mm) and 5 inches (125 mm) maximum from the front of the unit, the angle of the water stream shall be 15 degrees maximum
8. Cane protection is required to prevent a blind person from bumping into protruding objects that protrude more than 4" above a 27" elevation. (FBCA 307.2 & FBCA 305.7 respectively). Wing walls could be built or an apron that attaches to the taller unit could be used (see Figure 8e). The requirement is to have the apron at 27" (note 27" clear is required under DF's).
9. Interior drinking fountains cannot be used for exterior installation.

GENERAL

Accessory apron designed to bring Elkay water coolers into compliance with the Americans with Disabilities Act (A.D.A.) when units are mounted on an exposed wall. This apron provides the mandatory 27" (686 mm) floor to underside requirement when mounted in this manner. Suitable for use with models LZSTL8C, LZTL8C, EZSTL8C, EZTL8C, EZSTLR8C, EZTLR8C, EZSTLDDC, EZSTLRDDC and EZOSTL8C.

Construction

Thermo-formed textured ABS plastic. Available in gray only. Equipped with bottom cover plate.



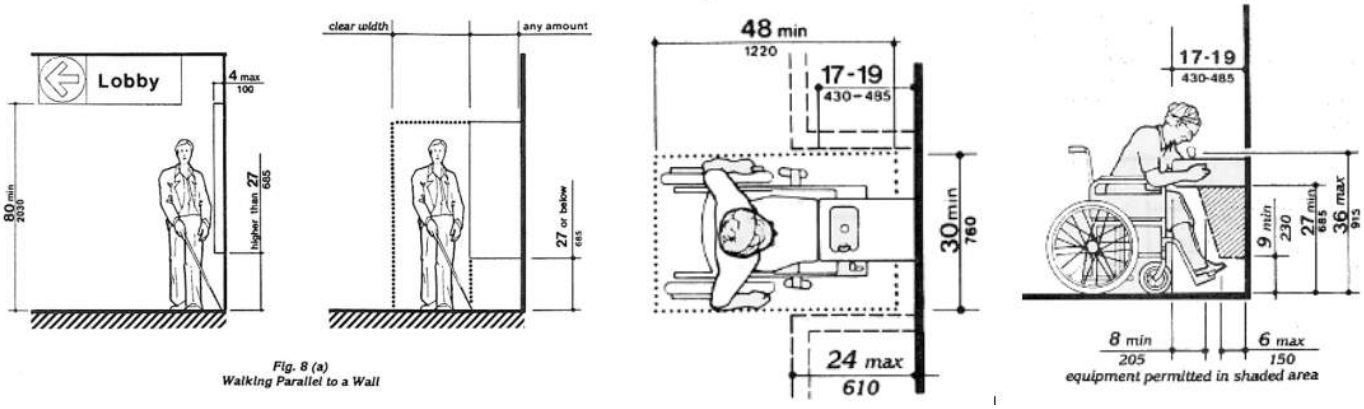


Fig. 8 (a)
Walking Parallel to a Wall

1 Hands-free Bottle Filling Station Combinations and Retrofit Kits

A.

Enhanced ezH2O Bottle Filling Stations						Cooler Cabinet Finish	
Model	**Type**	**Chilled GPH**	**Filtered**	**Quick Filter Change Wrapper**	**High-capacity Filtration**	**Light Gray**	**Stainless Steel**
LZS8WSLP	Single	8.0	•		•	•	
LZS8WSSP	Single	8.0	•	•	•		•
LZSTL8WSLP	Versatile Bi-level	8.0	•		•	•	
LZSTL8WSSP	Versatile Bi-level	8.0	•	•	•		•
LZS8WSSP-PF	Single	8.0	•	•	•		•
LZSTL8WSSP-PF	Versatile Bi-level	8.0	•	•	•		•
LZS8WSSP-W1	Single	8.0	•	•	•		•
LZSTL8WSSP-W1	Versatile Bi-level	8.0	•	•	•		•

LZS8WSSP

All models include a Flexi-Guard® safety bubbler.
Carton components (one carton): Bottle filler, water cooler and WaterSentry® filter.
-PF = PFOA/PFOS Reduction Filter
-W1 = Connected Ready Device

B.

Single ezH2O With Dual Hands-free Activation ♿			Cooler Cabinet Finish		Bubbler
Model	**Chilled GPH**	**Filtered**	**Light Gray Granite**	**Stainless Steel**	**Flex**
LZO8WSLK	8.0	•	•		•
LZO8WSSK	8.0	•		•	•
EZO8WSLK	8.0		•		•
EZO8WSSK	8.0			•	•


LZO8WSLK

Includes hands-free bubbler and hands-free bottle filling station.
Carton components (two cartons): Bottle filler, water cooler and WaterSentry filter (filtered models only).

Versatile Bi-level ezH2O With Hands-free Bubblers ♿			Cooler Cabinet Finish		Bubbler
Model	**Chilled GPH**	**Filtered**	**Light Gray Granite**	**Stainless Steel**	**Flex**
LZOOTL8WSLK	8.0	•	•		•
LZOOTL8WSSK	8.0	•		•	•
EZOOTL8WSLK	8.0		•		•
EZOOTL8WSSK	8.0			•	•


LZOOTL8WSLK

Includes (2) hands-free bubblers and (1) hands-free bottle filling station.
Carton components (two cartons): Bottle filler, water cooler and WaterSentry filter (filtered models only).

Versatile Bi-level ezH2O With Hands-free Bubbler ♿			Cooler Cabinet Finish		Bubbler
Model	**Chilled GPH**	**Filtered**	**Light Gray Granite**	**Stainless Steel**	**Flex**
LZOTL8WSLK	8.0	•	•		•
LZOTL8WSSK	8.0	•		•	•
EZOTL8WSLK	8.0		•		•
EZOTL8WSSK	8.0			•	•


LZOTL8WSLK

Includes (1) hands-free bubbler, (1) hands-free bottle filling station, and (1) push bar bubbler.
Carton components (two cartons): Bottle filler, water cooler and WaterSentry filter (filtered models only).

APPENDIX 28 01 | SECURITY AND ACCESS CONTROL COMMUNICATION MATRIX

MISSION:

Our Mission is to support and stimulate the educational goals of the College by constructing and maintaining safe, sustainable and inspirational environments while balancing our financial resources, leveraging the talent of local engineering, design, and construction professionals and maintaining relationships with the communities that support us.

ACCESS CONTROL MANAGER:

Our goal is to involve the Access Control Manager in our projects early on to avoid changes later in the project. The following steps will be taken:

1. The Access Control Manager will be invited to the Facilities Design and Construction monthly meetings to review status of projects.
2. The Access Control Manager will review the Construction Document's at 30% completion to place the location of the devices required.
3. The Access Control Manager will confirm location of the devices and complete scope on the 90% complete Construction Documents.
4. For all new construction and renovation projects the Access Control vendor will submit their proposal to the Construction Manager.
5. The Access Control Manager will assist as the BCSPM during the construction for Access Control scope.
6. The Access Control Manager will be responsible to request proposal and request purchase order for specific access control projects not related to new construction or renovation projects.

TITLE	RESPONSIBILITY / ROLES	PHONE NUMBER
BUDGET & PLANNING DIVISION		
AVP, Facilities Planning & Capital Budgets	Master Plan / Workday / Budget / Planning	954-201-6512
DESIGN AND CONSTRUCTION DIVISION		
AVP, Facilities Design & Construction	Budget / Plan / Oversee Construction & Renovation Process	954-201-6900
Senior Construction PM, North Campus	Main contact for North Campus, Cypress Creek, & YMCA	954-201-2550
Senior Construction PM, Central Campus	Main contact for Central Campus, Tigertail & DTC	954-201-6975
Senior Construction PM, South Campus	Main contact for South Campus, Miramar, & Pembroke Pines	954-201-8706
Captain, Campus Safety	College-wide Access Control Project Manager	954-201-5324
Manager, Physical Security Technology	College-wide Access Control Project Manager	954-201-5326