MONTGOMERY COLLEGE OFFICE OF PROCUREMENT

RFP NO.: 626-004
EAST GARAGE FIRE ALARM UPGRADE (PHASE 3)
TAKOMA PARK/SILVER SPRING CAMPUS
RFP CLOSING DATE/TIME: MAY 13, 2026 @ 2:00 PM
ADDENDUM #1
ISSUED: MAY 7, 2026

THE PURPOSE OF ADDENDUM IS TO MAKE CHANGES TO THE RFP DOCUMENTS AND PROVIDE ANSWERS TO THE REQUEST FOR CLARIFICATIONS OF RFP DOCUMENTS.

NOTE: Similar requests for information that were received from different Contractors have been grouped under a single addendum item where appropriate, with a single comprehensive answer provided.

PLEASE MAKE CHANGES TO RFP DOCUMENTS AS FOLLOWS:

Item 1-1 Revise Section 081113, Hollow Metal Doors and Frames to add verbiage for the fire rating of Door 004 and Door 005A See attached revised specification section.

Item 1-2 Revise Door hardware components in Section 087111, Door Hardware. See attached revised specification section.

Item 1-3 Revise Section 2.1.A and B in Section 099123, Interior Painting to provide miscellaneous paint/ color clarifications for clarity. See attached revised specification section.

PROVIDE ANSWERS TO THE REQUEST FOR CLARIFICATIONS QUESTIONS AS FOLLOWS:

Item 1-4 Question 1: New Telecom Rm 004 CMU Wall at Column Line J: The Bid Documents show the new CMU wall at the center line of the columns. Per our site visit yesterday, we noticed that the Precast Deck Tee will be in conflict with the wall. The existing CMU located in the Electrical Room appeared to be built behind the concrete Tee. Please review and advise if the new CMU wall is to be built behind or in front of the existing concrete Tee. Below is a snip of the floor plan where the existing concrete Tee is highlighted in blue for your reference.

Answer: The design intent is for the face of the new wall along column line G to align with the existing wall - regardless of the relationship to the concrete tee.

Item 1-5 Question 2: New Telecom Rm 004 Size: The new space appears to be 24'-8 1/2" L x 18' - 7 1/2" W, please confirm that this is the desired size for this new space.

Answer: The design intent is for the north wall of Room 004 to be 5'-0" from north face of existing telecom rack to remain. Confirm exact location in field. See answer to Question 1 for the location of west wall of Room 004.

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Item 1-6 Question 3: Existing Stored Materials: Please confirm that MC will remove/clear materials from the working zone or advise if the GC will need to include an allowance to clean/remove all stored materials.

Answer: The College will remove/clear out materials as needed to allow for the construction of new Telecom Room 004.

Item 1-7 Question 4: Card Readers: Per floor plan 3/E1.06; card readers are to be provided at Doors 003 & 004. Please review and advise on the following:

a. Confirm that Card Readers and associated conduits are to be surface mounted.
b. Confirm that Doors 005A and 005B are not to receive card readers
c. Please review Door Hardware Schedule on A101 and identify which doors are to receive Card Readers.
d. Please review section 087111 and make sure that all components are listed under 3.3 Door Hardware Sets. We believe that Power Supplies are missing from the Door Hardware Schedule. Also, it will be helpful to list the Card Readers on the Hardware Set.
e. Please confirm that JCI is the only contractor that has been approved by Montgomery College to furnish and install the Access Control System. Section 281000 and drawing 3/E1.06 indicate the scope of work; however, JCI's information is not provided.

Answer: Responses are as follows:

a. Confirmed.
b. Confirmed.
c. See hardware sets in revised specification Section 087111 for doors with access control hardware.
d. See hardware sets in revised specification Section 087111 for doors with access control hardware. Card readers are specified in spec section 281000.
e. Confirmed. JCI is sole sourced for access control.

Item 1-8 Question 5: Exhaust System: Please confirm that new Electrical Rm, Telecom Rm and existing storage room do not require any exhaust. We noticed that gas-power equipment is being stored in the existing Storage area.

Answer: Electrical Room 003, Telecom Room 004 and Storage Room 005 do not require exhaust.

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Item 1-9 Question 6: Painting: Specifications call for CMU to be painted. Please review and advise if only new CMU is to be painted or if new and existing are to be painted. Existing walls are not painted. Also, please advise if existing and new frames are to be painted. Door & Frame legend call for doors 003, 004, 005A, and 005B to be painted.

Answer: Paint interior face of new and existing CMU walls inside Room 004 only. Paint doors and frames for openings 003, 004, 005A, and 005B.

Item 1-10 Question 7: Elevator Contractor Scope of Work: Section 260100, item 3.14 provides a specific scope of work and item 6 reads about a 3rd Party Inspection. Usually, the 3rd Party Elevator Inspectors provide their services to the Elevator Contractor. We will contact Oracle Elevator Company to confirm that the 3rd Party will be working under them. Elevator Companies are the ones that will schedule the Final Inspection with DLLR only after the 3rd Party Inspection has been cleared. In addition to the scope provided under section 260100, item 3.14, the Elevator Company must provide the necessary time frame to operate the elevator so the Fire Alarm contractor can install and test their devices.

Answer: Comments are noted regarding 3rd party inspections. Comply with intent. Inspections must be provided. Delete all references to Oracle Elevator from Spec 260100, 3.14 and replace with District Elevators. Contact information for District Elevators is provided in response to Question 14.

Item 1-11 Question 8: New Penetrations: General notes read as follow "..In locations where floor slabs must be penetrated or core drilled, slab shall be X-Rayed to ensure structure is maintained (slabs are post-tension construction)..." - Since the parking deck will be occupied, any X-rays will need to be done off-hours. Please confirm that MC will provide access to perform off-hours work if necessary. Be advised that Drawing E0.1 General Note 37 indicates GPR Detection for new penetrations. Please advise which approach is required, X-Ray or GPR.

Answer: Delete reference to X-raying mentioned in General Note 3 on Drawings E1.06. General Note 37 on Drawing E0.01 which references GPR governs.

Item 1-12 Question 9: Fire Alarm Annunciator Panel - Graphic: Per section 283111, items 2.08 C & D indicate that FAAP is to be provided with Floor Plans. Please review and provide the desired graphic for the Fire Annunciator Panel.

Answer: Delete references to graphic annunciator panel in spec 283111, 2.08. Provide alphanumeric remote annunciator per Drawing Note 11 on E1.06.

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Item 1-13 Question 10: Existing Equipment to be removed: Please advise if MC is planning to retrain any equipment.

Answer: The College does not want to retain any existing equipment that is removed.

Item 1-14 Question 11: Drawing E0.1 General Electrical Note 4: Please review if this note is applicable to this project. Also advise if there is an existing Mass Notification Boards within the Parking Garage. Fire Marshal's Office has been requesting the Mass Notification Boards to be shown on Fire Alarm drawings when submitting for review and approval.

Answer: General Note 4 on Drawing E0.01 is not applicable. There are no existing mass notification message boards in the garage.

Item 1-15 Question 12: Drawing E0.1 General Electrical Note 10 Outages: Elevator will be impacted by the new Fire Alarm work. Please advise if Elevator can be out of service during normal business hours.

Answer: Elevator can be out of service during normal business hours. Coordinate with the College minimum of two weeks in advance of taking the elevator out of service.

Item 1-16 Question 13: Drawing E0.1 General Electrical Note 28: Please identify on drawings any existing rated assemblies.

Answer: General Note 28 on E0.01 pertains to fire stopping of conduit penetrations. Provide grout/mortar to seal around conduit penetrations. New doors 004 and 005A will be fire rated per the revised specifications included with this addendum.

Item 1-17 Question 14: Drawing E0.1 General Electrical Note 36: This note indicates that District Elevator is to be contacted for this project, however this differs from section 260100, item 3.14. Please review and advise which one is the correct Elevator Contractor. If District Elevator is the correct contractor, please provide responsible person's name, email address and cell phone number.

Answer: Delete all references to Oracle Elevator from Spec 260100, 3.14 and replace with District Elevators. District Elevator contact information is as follows: Richard Beauchamp, phone: 410-726-5227, email: Richie@districtelevators.com.

Item 1-18 Question 15: Drawing E1.06 Drawing Note 6: Please confirm that MYERS is the ONLY accepted manufacturer.

Answer: Confirmed.

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Item 1-19 Question 16: Light Fixtures: Section 265100, item 2.1_A reads "...Catalog series numbers shown on the Lighting Fixture Schedule on the drawings." - We have reviewed the drawings and understand that new Light Fixtures Type A are to be provided in Telecom Rm003. Please provide light fixtures model/manuf info. Also, please confirm that Light Fixtures in Electrical Rm are existing to remain.

Answer: See Light Fixture Schedule on E0.01 for type A light fixture information for Telecom Room 004. Light Fixtures in Electrical Room 003 are existing to remain.

Item 1-20 Question 17: Are Heat Detectors needed in the top of the elevator shaft?

Answer: Because there are no sprinklers in the garage, heat detectors can be deleted from the elevator shaft and elevator machine room.

All other specifications, terms and conditions remain unchanged.

Sections or Portions Reissued in Entirety

081113	Hollow Metal Doors and Frames
087111	Door Hardware
099123	Interior Painting

Drawings

E3.00	EG: Power Riser Diagram – Demolition & New Work & Panel Schedules (revised)

Sketches

NONE

Items Issued for Informational Purposes

NONE

Patrick Johnson

Patrick Johnson, MBA, CPPB
Director of Procurement

Please **sign** below to acknowledge receipt of this Addendum and return with the **Technical Proposal submission.** Failure to return this Acknowledgement of Addendum may deem a proposal nonresponsive.

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Continued

NOTE: ACKNOWLEDGEMENT OF RECEIPT OF RFP ADDENDA WILL NOT BE ACCEPTED BY FACSIMILE OR E-MAIL.

_____	_____
Company Name	Authorized Signature
_____	_____
Date	Printed/Typed Signature

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior standard steel doors and frames.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of fire-rated hollow-metal door and frame assembly or thermally rated door assemblies for tests performed by a qualified testing agency indicating compliance with performance requirements.

B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.40 deg Btu/F x h x sq. ft. (2.27 W/K x sq. m) when tested in accordance with ASTM C1363 or ASTM E1423.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated in Part 3, based on testing at positive pressure in accordance with NFPA 252 or UL 10CExtra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A.

2.2 STEEL DOORS AND FRAMES

A. ~~Construct~~ Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A. Hollow-metal doors and frames to comply with standards indicated for materials,

fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

1. Doors:

   a. Type: As indicated in the Door and Frame Schedule on Drawings.
   b. Thickness: 1-3/4 inches.
   c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 (ZF120) coating.
   d. Edge Construction: Model 2, Seamless.
   e. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
   f. Bottom Edges: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
   g. Core: Manufacturer's standard.
   h. Fire-Rated Core: Manufacturer's standard vertical steel stiffener with insulation core for fire-rated doors.

2. Frames:

   a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 (ZF120) coating.
   b. Construction: Full profile welded.

2.3 FRAME ANCHORS

A. Jamb Anchors:

   1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
   2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor.
   3. Post-installed Expansion Anchor: Minimum 3/8-inch-diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

   1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.4 MATERIALS

A. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

B. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.

C. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

2.5 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

B. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule on Drawings, and templates.

1. Reinforce doors and frames to receive non-templated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

2.6 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
2. Floor Anchors: Secure with post-installed expansion anchors.

a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.

3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
4. In-Place Concrete or Masonry Construction: Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
5. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

B. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
2. Fire-Rated Doors: Install doors with clearances in accordance with NFPA 80.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Owner may engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

C. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 REPAIR

A. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint in accordance with manufacturer's written instructions.

B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

3.5 DOOR TYPES

A. Door 003: Thermally rated.

B. Door 004: Thermally rated and fire-rated.

C. Door 005A: Thermally rated and fire-rated.

D. Door 005B: Thermally rated.

END OF SECTION 08 1113

SECTION 087111 - DOOR HARDWARE (DESCRIPTIVE SPECIFICATION)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanical door hardware for the following:

a. Swinging doors.

2. Electrified door hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For electrified door hardware.

1. Include diagrams for power, signal, and control wiring.
2. Include details of interface of electrified door hardware and building safety and security systems.

C. Door hardware schedule.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.

1. Scheduling Responsibility: Preparation of door hardware and keying schedule.
2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:

~~a. Electromagnetic Locks: Five years from date of Substantial Completion.~~

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 HARDWARE ITEMS

A. Continuous, Gear-Type Hinges:

1. Extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.
2. Acceptable Manufacturers: PBB, Inc., Select Products Limited, or Zero International.
3. Grade: 1-300.
4. Mounting: Full surface, with removable continuous caps over fasteners.
5. Electric Feature: Electric through wires and monitor

B. Cylinders:

1. Acceptable Manufacturers: Corbin Russwin Architectural Hardware.
2. Provide cylinders for locksets, locking trim for exit devices, exit device dogging, lockable mullions, and any other lock cylinders required.
3. Cylinders shall be 6-Pin, interchangeable core type with cores removable by special control key.
4. Equip all cylinders with brass color-coded, temporary cores for use during construction and for testing the hardware; plastic cores are prohibited.
5. Include all necessary extensions, cams, tail pieces and hardened collars required for a complete installation.

C. Locks and Latches:

1. Acceptable Manufacturers: Corbin Russwin Architectural Hardware or Yale Security, Inc.
2. Mortise locks and latches shall be equal to Corbin Russwin ML2000 Series with NSA trim.

a. All internal working parts shall be brass, bronze, steel or stainless steel. For each lock and latchset, provide strike box and square corner ASA strike with curved lip of sufficient length to protect frame; at pairs of doors furnish flat lip strikes.
b. Furnish knurling to lever on corridor side of door to all doors leading to hazardous areas (e.g. Mechanical Rooms, Electrical Rooms, Elevator Machine Rooms, etc.).

3. Furnish keyed devices with cylinders keyed to building system.
4. Electrical Modifications:
   a. Field-connect electrified locks to associated power transfer units; coordinate electrical connection and installation with Divisions 26 and 28.

D. Exit Devices and Exit Device Accessories: Von Duprin, Inc.

1. Where lever handle functions are required on exit devices, they shall match the design and construction of lever handles specified for mortise locks.
   a. At mortise exit devices, provide strike box and square corner, stainless steel ASA strike with curved lips of sufficient length to protect frame; at pairs of doors furnish flat lip strikes.
2. Furnish with provision for concealed mounting, through bolts will not be acceptable.
3. Furnish keyed devices with cylinders keyed to building system.
4. Provide UL-labeled fire-exit hardware at fire-rated openings.
5. Electrical Modifications:
   a. Exit devices specified to be electrified shall be factory-modified to Electrically Lock (FAIL SAFE) or Electrically Unlock (FAIL SECURE), as indicated, upon receipt of a 24V signal and will remain in this mode until signal is interrupted.
   b. Exit devices indicated to have electric latch retraction shall be modified to electrically unlatch (dog down) upon receipt of a 24V signal and will remain unlatched until signal is interrupted.
   c. Field-connect electrified exit devices to associated power transfer units. Coordinate electrical connection and installation with Divisions 26 and 28.

E. Overhead Stops and Holders

1. Overhead Stops and Holders: BHMA A156.8.
2. Overhead Surface-Mounted, Nonfriction Slide Stops: Type 5; Grade 1; with nonfrictional element held under adjustable pressure and shock absorber; for single-acting doors opening 110 degrees.
3. Acceptable Manufacturers: Architectural Builders Hardware, Glynn-Johnson, Rixson or Rockwood Manufacturing Company.
4. Furnish concealed overhead stops equal to Glynn-Johnson 410S.

F. Door Gasketing

1. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
2. Maximum Air Leakage: When tested in accordance with ASTM E283 with tested pressure differential of 0.3-inch wg, as follows:
   a. Gasketing on Single Doors: 0.3 cfm/sq. ft. of door opening.
3. Rigid, Housed, Perimeter Gasketing: Sponge neoprene gasket material held in place by housing; fastened to frame stop with screws.
   a. Housing Material: Aluminum.
4. Door Sweeps: Neoprene gasket material held in place by flat housing or flange; surface mounted to face of door with screws.
   a. Housing or Flange Material: Aluminum.

G. Thresholds

1. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

2. Acceptable Manufacturers: National Guard Products, Inc., Pemko Manufacturing Company, Reese Enterprises, Inc. or Zero International

3. Saddle Thresholds:

a. Type: Thermal break and fluted top.
b. Base Metal: Aluminum.

2.3 AUXILIARY ELECTRIFIED DOOR HARDWARE

A. Boxed Power Supplies: Modular unit in NEMA ICS 6, Type 4 enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; listed and labeled for use with fire-alarm systems.

~~B. Door Position Switches: Magnetically operated reed switch designed for concealed mounting.~~

~~C. Door and Frame Transfer Devices: Steel housing for mortise in hinge stile of door, with flexible tube for wiring bundle; accommodating doors that swing open to 120 degrees.~~

2.4 FINISHES

A. Provide finishes complying with BHMA A156.18 as follows:

1. Steel Base Metal: Brushed stainless steel 630.
2. Aluminum Base Metal: Clear anodized 628 or mill finish.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

C. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Furnish permanent cores to Owner for installation.

D. Boxed Power Supplies: Locate power supplies in equipment room. Coordinate location with other equipment in room.

1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of non-curing sealant recommended for application by manufacturer.

F. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

1. Do not notch perimeter gasketing to install other surface-applied hardware.

3.2 ADJUSTING

A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.3 DOOR HARDWARE SCHEDULE

A. Hardware Set A:

1. Door: 003
2. Access Control: Yes.
3. Fire rating: None.
4. Hardware:
   a. Continuous electric geared hinge.
   b. Electrified Lockset: Rim Exit Device with entry function.
   c. Overhead stop.
   d. Threshold.
   e. ~~Weatherstripping~~ Gasketing.
   f. Door sweep.
   g. Boxed power supply

B. Hardware Set B:

1. Door: 004
2. Access Control: Yes.
3. Fire rating: 45 minutes.
4. Hardware:
   a. Continuous electric geared hinge.
   b. Electrified Lockset: Rim Exit Device with entry function.
   c. Overhead stop.
   d. Threshold.
   e. ~~Weatherstripping~~ Gasketing.
   f. Door sweep.
   g. Boxed power supply

C. Hardware Set C:

1. Door: 005A
2. Access Control: No.
3. Fire rating: 45 minutes.
4. Hardware:
   a. Continuous geared hinge.
   b. Rim Exit Device without exterior trim.
   c. Overhead stop.
   d. Threshold.
   e. ~~Weatherstripping~~ Gasketing.
   f. Door sweep.

D. Hardware Set D:

1. Pair Doors: 005B
2. Access Control: No.
3. Fire rating: None.
4. Hardware:
   a. Continuous geared hinge: Each leaf.
   b. Lockset – Entry function: Active leaf.
   c. Dummy Trim: Inactive leaf.
   d. Manual Surface Flush Bolts: Inactive leaf.
   e. Overhead stop: Each leaf.
   f. Threshold.
   g. ~~Weatherstripping~~ Gasketing.
   h. Door sweeps.

END OF SECTION 087111

SECTION 09 9123 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on interior substrates.

1. Concrete masonry units (CMUs).
2. Steel and iron.
3. Concrete traffic surfaces.

1.3 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
2. Indicate VOC content.

B. Sustainable Design Submittals:

1. Product Data: For paints and coatings, indicating VOC content.
2. Laboratory Test Reports: For paints and coatings, indicating compliance with requirements for low-emitting materials.

C. Samples for Initial Selection: For each type of topcoat product.

D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.

E. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

~~B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] or comparable product by one of the following:~~

1. Benjamin Moore & Co.
2. PPG Architectural Finishes, Inc.
3. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:

1. Flat Paints and Coatings: 50 g/L.
2. Non-flat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Under-coaters: 100 g/L.
5. Rust-Preventive Coatings: 100 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
7. Pretreatment Wash Primers: 420 g/L.

D. Colors: As selected by Applicator and approved by Owner and Architect to match adjacent construction.

1. Hollow metal doors and frames: Match existing Door 003 color.

2. CMU Walls: Match existing wall color adjacent to Door 003.

3. Concrete Traffic Surfaces: Medium-dark gray color.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Masonry (Clay and CMUs): 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply

additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. New or existing CMU substrates: inside Telecom Room 004 only ~~and previously painted concrete surfaces in work area, except as directed by Owner~~:

1. Institutional Low-Odor/VOC Latex System MPI INT 4.2E:

   a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3), MPI #145.

      ~~1) For CMU wall surfaces and previously painted concrete surfaces.~~

B. New and Existing Hollow Metal Doors and Frames (# 003, 004, 005A, and 005B) ~~Steel Substrates:~~

1. Institutional Low-Odor/VOC Latex System MPI INT 5.1S:

   a. Prime Coat: Primer, rust inhibitive, water based MPI #107.
   b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
   c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5), MPI #147.

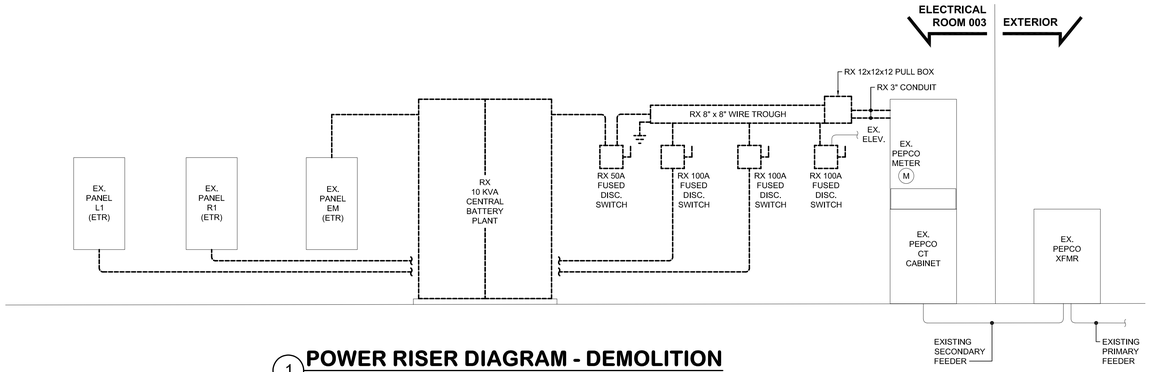
C. Concrete Traffic Surfaces in Telecom Room 004 only:

1. Floor Enamel, Alkyd, Gloss:

   a. Prime Coat: As identified in writing by top coat manufacturer to suit existing concrete slab.
   b. Intermediate and Top Coat: Alkyd floor enamel, Gloss.

END OF SECTION 09 9123

DPS ELECTRONIC STAMP:



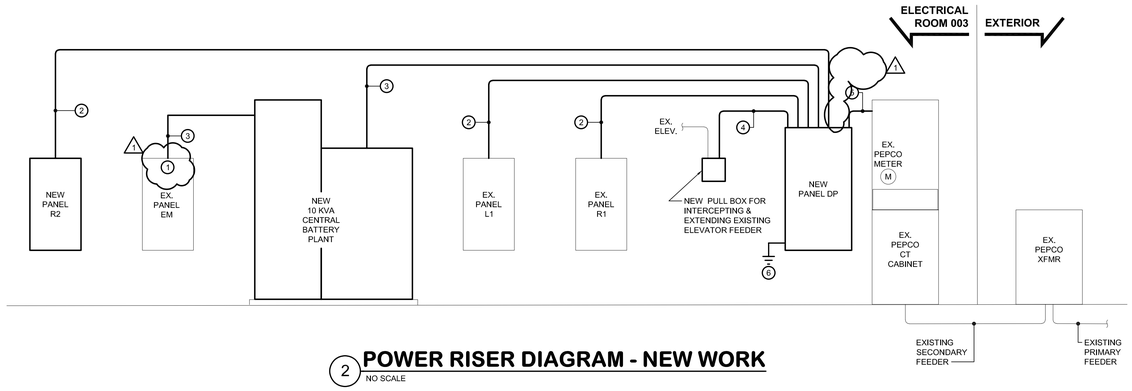
1 POWER RISER DIAGRAM - DEMOLITION

NO SCALE

PANEL: DP RATING: 400 AMPS MAIN: MCB VOLTAGE: 208 Y 120 V 3 PH 4 W
AIC: 22,000 MOUNTING: SURFACE NOTE: SERVICE ENTRANCE LABELED
LOCATION: -

CKT	EQUIPMENT SERVED	LOAD (KVA) AØ	BØ	CØ	CB	BUS ABC	CB	LOAD (KVA) AØ	BØ	CØ	EQUIPMENT SERVED	CKT
1	EX. PANEL L1	10			100		100	7.1			EX. ELEVATOR	2
3	- - - - - - - - - - - - - -		9						7.1		- - - - - - - - - - - - - -	4
5	- - - - - - - - - - - - - -			9						7.1	- - - - - - - - - - - - - -	6
7	EX. PANEL R1	7.2			100		50	2			10 KVA INVERTER - PANEL EM	8
9	- - - - - - - - - - - - - -		7.2						2		- - - - - - - - - - - - - -	10
11	- - - - - - - - - - - - - -			7.2						2	- - - - - - - - - - - - - -	12
13	NEW PANEL R2	3.2			100						SPACE	14
15	- - - - - - - - - - - - - -		3.0								SPACE	16
17	- - - - - - - - - - - - - -			0.2							SPACE	18
19	SPACE										SPACE	20
21	SPACE										SPACE	22
23	SPACE										SPACE	24
25	SPACE										SPACE	26
27	SPACE										SPACE	28
29	SPACE										SPACE	30
31	SPACE										SPACE	32
33	SPACE										SPACE	34
35	SPACE										SPACE	36
37	SPACE										SPACE	38
39	SPACE										SPACE	40
41	SPACE										SPACE	42
		20.4	19.2	16.4		SUB-TOTALS		9.1	9.1	9.1		

CONNECTED LOAD:
AØ: 29.5 KVA= 245.8 A
BØ: 28.3 KVA= 235.8 A
CØ: 25.5 KVA= 212.5 A



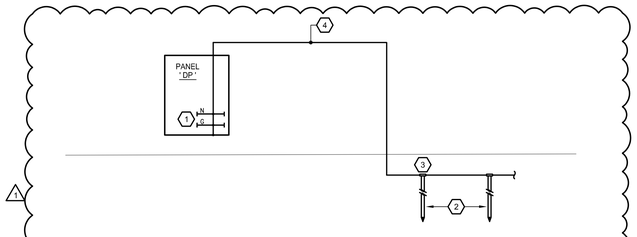
2 POWER RISER DIAGRAM - NEW WORK

NO SCALE

PANEL: R2 RATING: 100 AMPS MAIN: MLO VOLTAGE: 208 Y 120 V 3 PH 4 W
AIC: 22,000 MOUNTING: SURFACE NOTE:
LOCATION: -

CKT	EQUIPMENT SERVED	LOAD (KVA) AØ	BØ	CØ	CB	BUS ABC	CB	LOAD (KVA)			EQUIPMENT SERVED	CKT
1	CU-1 & AC-1	3			50		20				SPARE	2
3	- - - - - - - - - - - - - -		3				20				SPARE	4
5	RECEPTACLE			0.2	20		20				SPARE	6
7	RECEPTACLE	0.2			20		20				SPARE	8
9	SPARE				20		20				SPARE	10
11	SPARE				20		20				SPARE	12
13	SPACE										SPACE	14
15	SPACE										SPACE	16
17	SPACE										SPACE	18
19	SPACE										SPACE	20
21	SPACE										SPACE	22
23	SPACE										SPACE	24
25	SPACE										SPACE	26
27	SPACE										SPACE	28
29	SPACE										SPACE	30
		3.2	3.0	0.2		SUB-TOTALS		0.0	0.0	0.0		

CONNECTED LOAD:
AØ: 3.2 KVA= 26.7 A
BØ: 3.0 KVA= 25.0 A
CØ: 0.2 KVA= 1.7 A



3 GROUNDING RISER DIAGRAM - NEW WORK

NO SCALE

GENERAL NOTES:

1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO FLOOR PLANS FOR ADDITIONAL INFORMATION.

DRAWING NOTES:

1. RECONNECT TO EXISTING 50A MCB PANEL EM.
2. 4 #2, 1 #8 GW IN 1 1/4" CONDUIT.
3. 4 #6, 1 #10 GW IN 1" CONDUIT.
4. 3 #2, 1 #8 GW IN 1 1/4" CONDUIT.
5. (2 SETS) 4 #3/0, 1 #2 GW IN 2" CONDUIT.
6. PROVIDE NEW SERVICE ENTRANCE GROUNDING PER NEC ARTICLE 250, SEE GROUNDING RISER DIAGRAM ON THIS DRAWING.

RISER DIAGRAM NOTES:

1. BOND NEUTRAL & GROUND BARS
2. PROVIDE GROUND GRID CONSISTING OF A MINIMUM OF (3) 10'-0" x 3/4" DIAMETER COPPER-CLAD DRIVEN GROUND RODS. EXTEND #3/0 BARE CONDUCTOR BETWEEN RODS, TO MAIN GROUND BAR WITHIN ELECTRIC ROOM. THERMOWELD ALL BELOW GRADE CONNECTIONS.
3. PROVIDE TEST WELL ON GROUND ROD CLOSEST TO MAIN ELECTRICAL ROOM.
4. 1 #2 AWG INSULATED COPPER GROUND WIRE IN 1 1/2" CONDUIT

bkm
Burdette, Koehler, Murphy & Associates, Inc.
Mechanical / Electrical Engineers
6300 Blair Hill Lane, Suite 400
Baltimore, Maryland 21209
P: 410.323.0600 | www.bkma.com

PROJECT NAME:

Montgomery College

MONTGOMERY COLLEGE

Central Administration
Office of Facilities
40 W Gude Drive, Suite 200
Rockville, MD 20850
Telephone: 240-567-7363

EAST GARAGE FIRE ALARM UPGRADE PHASE No.3 at Montgomery College Takoma Park Campus

SEAL:

PROFESSIONAL CERTIFICATION:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. _____. EXPIRATION DATE: _____.

ISSUED FOR:

DATE	DESCRIPTION
2/25/22	95% CD SUBMISSION
11/18/22	95% CD RESUBMISSION
3/17/23	100% CD SUBMISSION
3/29/24	100% FOR CONSTRUCTION
12/19/25	100% FOR CONSTRUCTION
5/6/26	ADDENDUM 1

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

POWER RISER DIAGRAM DEMOLITION & NEW WORK & PANEL SCHEDULES

DRAWING NO:

E3.00

BKM: 13058.06

ARL: G:\13058.06\Drawings\Arcad\E\EG E3D0 Riser Diagram D N
Plotted By: Ron Boutista | 4/30/2026 1:50 PM

Request for Proposal

RFP No.: 626-004
East Garage Fire Alarm Upgrade (Phase 3)
Takoma Park/Silver Spring Campus

Facilities Project #FP17-151

Issue Date: April 13, 2026
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

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APPENDIX A

Direction to the Pre-Proposal Meeting on the Takoma Park/Silver Spring Campus

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MONTGOMERY COLLEGE

Procurement Office, Central Services
9221 Corporate Boulevard
Rockville, Maryland 20850
Phone: (240) 567-5292

REQUEST FOR PROPOSAL No. **626-004**

DATE ENTERED	BID CLASS	PAGE of

THIS IS NOT AN ORDER

MONTGOMERY COLLEGE

REQUEST FOR PROPOSAL
RFP NO.: 626-004

EAST GARAGE FIRE ALARM UPGRADE (PHASE 3)
TAKOMA PARK/SILVER SPRING CAMPUS

It is the intent of this Request for Proposal (RFP) to provide Montgomery College with fire alarm and electrical work on the Takoma Park/Silver Spring campus, located at 7600 Takoma Avenue Takoma Park, MD 20912, in accordance with the terms, conditions, specifications and drawings described herein. A brief summary of the scope of work includes the renovation of the electrical room and replace existing fire alarm system complete.

This RFP will be conducted by using a single step two-envelope bidding procedure. Offerors shall submit their Technical Proposals (Part A) and Price Proposals (Part B) in two separate and sealed envelopes/boxes simultaneously. One original hard copy of the complete Technical Proposal submission with original ink signatures, plus one electronic version of complete Technical Proposal submission saved as PDF on a separate clearly marked USB flash drive; and one original and one hard copy of Price Proposal submission are required.

Complete SEALED offers comprising Technical Proposals and Price Proposals must be delivered and received by the Montgomery College Procurement Office located at **9221 Corporate Blvd., Rockville, Maryland 20850** on or before **2 p.m. on May 13, 2026**. Proposals will not be accepted if sent by facsimile or electronic mail, or if received after the closing date and time.

Proposals must remain valid for **ninety (90) days** from the proposal closing date and prior to contract award. Upon contract award, prices must remain firm for the duration of the overall contract term.

All required submissions must accompany each proposal. Incomplete proposals may be deemed non-responsive and will not be considered further.

An electronic PDF version of RFP documents can be downloaded from the Montgomery College Procurement website at http://www.montgomerycollege.edu/procure/ on or after **April 13, 2026.**

A Pre-Proposal Conference will be held at 10:00 a.m. on April 17, 2026, in Room 302 of Charlene R. Nunley Student Services Center (ST), 7600 Takoma Avenue Takoma Park, Maryland 20912. Attendance by Contractors is strongly encouraged. **A site inspection opportunity will be provided right after the Pre-Proposal meeting.** Site examination is **mandatory** and verification of the examination by a College representative is required.

Request for clarifications from perspective Offerors must be submitted in writing no later than **5:00 p.m., on April 22, 2026**. All questions related to this solicitation shall be directed to Yu (Judy) Zhu, Procurement and Contracts Manager via email to yu.zhu@montgomerycollege.edu. Only answers provided via a written addendum issued by the College will be binding.

Proposal submission will be evaluated by a College Evaluation Committee. Evaluation will be based on the substantiated ability of the Offerors to perform the required construction services described in the RFP documents, and the Offeror's responsiveness to Technical Proposal and Price Proposal requirements. Technical Proposals will be opened first and reviewed. Price Proposals from only those Offerors deemed qualified following the review of the Technical Proposals, will then be opened and reviewed. Price Proposals from those Offerors deemed not qualified by the College after the review of the Technical Proposals will not be opened. An award will be recommended in the best interest of the College to the Offeror

achieved the highest combined scores of technical and price proposal evaluations, who can meet or exceed the terms, conditions, and specifications of this solicitation, including project delivery requirements.

Bid and Performance Security Requirements apply as follows:

Bid Bond Requirements:	**not less than 5% of the total bid amount, including all add alternates, but excluding all deduct alternates is required for bidding, if the total base bid amount exceeds $100,000.**
Performance, Labor and Material Bonds requirements:	**100% Performance and 100% Labor and Material Payment Bonds** upon signature of the Contract.

Insurance certificate and other required documents after the contract award, and prior to start of any work.

State of Maryland Prevailing Wage law requirements are NOT applicable to the project.

Minority firms are encouraged to respond to this solicitation.

IMPORTANT: YOUR PROPOSAL WILL BE JEOPARDIZED IF ANY PORTION OF THIS INQUIRY IS NOT COMPLETE. NO PROPOSAL WILL BE ACCEPTED AFTER THE DATE AND TIME STATED ABOVE.

Patrick Johnson

Patrick L. Johnson, MBA, CPPB
Director of Procurement

NOTE: Prospective Offerors who have received this document from a source other than the Procurement Office should immediately contact the Procurement Office and provide their name and e-mail address so that any amendments to the Bid/RFP or other communications can be sent to them. Failure to contact the Procurement Office may result in non-receipt of important information.

REGISTRATION OF CORPORATIONS NOT REGISTERED IN THE STATE OF MARYLAND Pursuant to 7-202 et. Seq. of the Corporation and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State of Maryland shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201 before doing any interstate or foreign business in this State. **Corporations must be registered, and in good standing no later than proposal submittal deadline date**. A copy of the registration or application for registration may be requested by the College. The registration process can be completed at the following link: https://businessexpress.maryland.gov/start/register-a-business-in-maryland

NOTE: Failure to complete the registration process by the proposal submittal deadline listed above, WILL result in the disqualification of your submitted proposal.

CONDITIONS AND INSTRUCTIONS

1. ADDITIONAL ORDERS: Unless it is specifically stated to the contrary in the bid response, the College reserves the option to place additional orders against a contract awarded as a result of this solicitation at the same terms and conditions, if it is mutually agreeable.

2. APPLICABLE LAW: This contract shall be construed and interpreted according to Maryland law.

3. ASSURANCE OF NON-CONVICTION OF BRIBERY: The bidder hereby declares and affirms that, to its best knowledge, none of its officers, directors or partners and none of its employees directly involved in obtaining contracts has been convicted of bribery, attempted bribery or conspiracy to bribe under the laws of any state or the Federal government.

4. AUDIT: Bidder shall permit audit and fiscal and programmatic monitoring of the work performed under any contract issued from this solicitation. The College shall have access to and the right to examine and/or audit any records, books, documents and papers of bidder and any subcontractor involving transactions related to this Agreement during the term of this Agreement and for a period of three (3) years after final payment under this Agreement.

5. AWARD CONSIDERATIONS: Awards of this bid will be made to the lowest responsible bidder conforming to specifications with consideration being given to quantities involved, time required for delivery, purpose for which required, responsibility of bidder and its ability to perform satisfactorily with consideration to any previous performance for Montgomery Community College. A bid may be awarded at the sole discretion of the College in the best interest of the College. Prompt payment discounts will not be considered in bid evaluation. All discounts other than prompt payment are to be included in bid price.

6. BID AND PERFORMANCE SECURITY: If bid security is required, a bid bond or cashier's check in the amount indicated on the bid cover must accompany each bid and be made payable to Montgomery Community College. Corporate or certified checks are not acceptable. Bonds must be in a form satisfactory to the College and underwritten by a company licensed to issue bonds in the State of Maryland. If bid security fails to accompany the bid, it shall be deemed unresponsive, unless the Director of Procurement deems the failure to be nonsubstantial. Such bid bonds or checks will be returned to all except the three (3) lowest bidders within five (5) days after the opening of bids, and the remaining checks or bid bonds will be returned to all but successful bidder(s) within forty-eight (48) hours after award of contract. If a performance bond is required, the successful bidder must submit an acceptable performance bond in the designated amount of the bid award, prior to award of contract. All bid bonds will be returned to the successful bidder(s) within fortyeight (48) hours after receipt of the performance bond.

7. BRAND NAMES: Brand name materials used in these specifications are known and acceptable. Bids including proposals to use alternate brands are invited as long as they are of equal type and equal or better quality. The burden of proof that alternate brands are in fact equal or better falls on the bidder, and proof must be to the College's satisfaction.

8. COMPLIANCE WITH LAWS: Bidder agrees to comply, at no additional expense, with all applicable Executive orders, Federal, State, bi-county, regional and local laws, ordinances, rules and regulations in effect as of the date of this Agreement and as they may be amended from time to time, including but not limited to the equal employment opportunity clause set forth in 41 CFR 60-250.4.

9. CONTINGENT FEES: Bidder hereby declares and affirms that neither it nor any of its representatives has employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the bidder, to solicit or secure a contract, and that it has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or any other consideration contingent on the making of a contract as a result of this solicitation.

10. DELIVERY AND PACKING: All prices quoted must include delivery. All goods delivered under this contract shall be packed in accordance with accepted trade practices. No charges may be made over and above the bid price for packaging, or for deposits or containers unless specified in the bid. No charge will be allowed for cartage unless by prior written agreement. Complete deliveries must be made by the successful bidder to the designated location as indicated on the Montgomery Community College purchase order. A packing slip shall be included in each shipment. All deliveries must be prepaid and must be delivered to each location designated on purchase order at no additional cost. DELIVERIES MUST BE MADE TO THE SPECIFIED LOCATION. NO COLLECT SHIPMENTS OR SIDEWALK DELIVERIES WILL BE ACCEPTED.

11. DELIVERY OF BIDS: Sealed bids must be received in the Procurement Office by the date and time specified in the bid in order to be considered. NO LATE BIDS OR PROPOSALS WILL BE ACCEPTED. Late bids will be returned to the bidder unopened. Bids submitted by mail must be addressed to the Procurement Office, Montgomery College, P.O. Box 1006, Rockville, Maryland 20850, and clearly marked to indicate the bid number, title and opening date. Hand delivered bids will be accepted only at the Procurement Office, Montgomery College Central Administrative Center, located at 9221 Corporate Boulevard, Rockville, Maryland 20850.

12. DISPUTES: Any dispute arising under a contract awarded as a result of this bid which is not disposed of by agreement shall be decided by the President of the College or designee. Pending the final decision of the dispute, contractor shall proceed with the contract performance. Nothing hereunder shall be interpreted to preclude the parties from seeking after completion of the contract any and all remedies provided by law.

13. ERRORS IN BIDS: Bidders are assumed to be informed regarding conditions, requirements, and specifications prior to submitting bids. Failure to do so will be at the bidder's risk. Bids already submitted may be withdrawn without penalty prior to bid opening. Errors discovered after bid opening may not be corrected. In the case of an error in price extension, the unit price will govern. The intention of the bidder must be evident on the face of the bid.

14. HAZARDOUS AND TOXIC SUBSTANCES: Bidder must comply with all applicable Federal, State, County and bi-county laws, ordinances and regulations relating to hazardous and toxic substances, including such laws, ordinances and regulations pertaining to access to information about hazardous and toxic substances, and as amended from time to time. Bidder shall provide the College with a "Material Safety Data Sheet" or in the case of a controlled hazardous waste substance, a hazardous waste manifest for all hazardous chemicals listed or subsequently added to the Chemical Information List in compliance with applicable laws, ordinances and regulations.

15. INSPECTION OF PREMISES: If a site visit is recommended or required, each bidder is responsible to visit the site(s) prior to submitting a bid in order to observe the existing conditions affecting the work, and to obtain precise dimensions of the area(s) involved. No allowance will be made to the successful bidder, at a later date, for additional work required because of his or her failure to visit the site and/or to obtain the exact dimensions. Discrepancies, if any, must be reported to the College.

16. INSURANCE: If a contract results from this bid, the contractor shall maintain such insurance as will indemnify and hold harmless the College from Workmen's Compensation and Public Liability claims for property damage and personal injury, including death, which may arise from the contractor's operations under this contract, or by anyone directly or indirectly employed by him/her.

17. MARYLAND PUBLIC INFORMATION ACT: Bidder recognizes that the College is subject to the Maryland Public Information Act, Title 10 of the State Government Article of the Annotated Code of Maryland. Bidder agrees that it will provide any justification as to why any material, in whole or in part, is deemed to be confidential, proprietary information or trade secrets and provide any justification of why such materials should not be disclosed pursuant to the Maryland Public Information Act.

18. NON-ASSIGNMENT AND SUBCONTRACTING: Bidder shall not assign any contract or any rights or obligations hereunder without obtaining prior written consent of the College. No contract shall be made by bidder with any other party for furnishing the services to be performed under a contract issued from this solicitation without the written approval of the College. These provisions will not be taken as requiring the approval of the contract of employment between bidder and its personnel.

19. NON-COLLUSION: Bidder certifies that it has neither agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the bid or offer being submitted herewith; bidder also certifies that it has not in any manner, directly or indirectly, entered into any agreement, participated in any collusion to fix the bid price or price proposal of the bidder or offeror herein or any competitor, or otherwise taken any action in restraint of free competitive bidding in connection with the contract for which the within bid or offer is submitted.

20. NON-DISCRIMINATION: Bidder assures the College that, in accordance with applicable law, it does not, and agrees that it will not discriminate in any manner on the basis of sex, race, age, color, creed, national origin, religious belief, handicap, marital status, or status as a disabled veteran or veteran of the Vietnam era. Bidder further agrees to post in conspicuous places notices setting forth the provisions of the nondiscrimination clause and to take affirmative action to implement the provisions of this section. Bidder further assures the College that, in accordance with the Immigration Reform and Control Act of 1986, it does not and will not discriminate against an individual with respect to hiring, or recruitment or referral for a fee, of the individual for employment or the discharging of the individual from employment because of such individual's national origin or in the case of a citizen or intending citizen, because of such individual's citizenship status.

21. PATENTS: Bidder guarantees that the sale and/or use of the goods offered will not infringe upon any U.S. or foreign patent. Bidder will at his/her own expense, indemnify, protect and save harmless the College, its trustees, employees, agents and students with respect to any claim, action, cost or judgment for patent infringement, arising out of the purchase or use of these goods.

22. PREPARATION OF BID: Bids submitted must be hand signed by an authorized agent of the company submitting the bid. Notification of award will be made by "Notice of Intent to Award" and/or purchase order. A bidder may attach a letter of explanation to the bid for clarification. Bidders will be required, if requested by Montgomery Community College, to furnish satisfactory evidence that they are, in fact, bona fide manufacturers of or dealers in the items listed, and have a regularly established place of business. The College reserves the right to inspect any bidder's place of business prior to award of contract to determine bidder responsibility.

23. PRODUCT TESTING DURING TERM OF CONTRACT: Goods delivered under any contract resulting from this Request for Bid may be tested for compliance with specifications stipulated herein. Any shipment failing to meet or comply fully with the specification requirements will be rejected. The cost of testing a representative sample of an order or shipment for acceptance shall be borne by the College unless the order is rejected for failure to meet specifications or purchase description. In such cases of rejection, the cost of testing will be charged back to the vendor.

24. RECORD RETENTION: If awarded a contract, vendor shall maintain books and records relating to the subject matter of this Agreement, including but not limited to all charges to the College, for a period of three (3) years from the date of final payment under this Agreement.

25. REJECTIONS AND CANCELLATIONS: Montgomery Community College reserves the right to accept or reject any or all bids in whole or in part for any reason. The College reserves the right to waive any informalities and to make awards in the best interest of the College. The College also reserves the right to reject the bid of any bidder who has previously failed to perform adequately on a prior award for furnishing goods and/or services similar in nature to those requested in this bid. The College may cancel this solicitation in whole or in part, in its sole discretion.

26. RIDER PROVISION FOR MONTGOMERY COUNTY PUBLIC SCHOOLS AND MONTGOMERY COUNTY: The bidder agrees when submitting the bid that it will make available to every office and department of the Montgomery County Public Schools and the Montgomery County Government the same bid prices, terms and conditions offered during the term of contract. Orders will be placed directly by these agencies. There will be no penalty if bidder notes exception to this provision in the bid offered.

27. SAMPLES AND CATALOG CUTS: If samples are required, bidder shall be responsible for delivery of samples to location indicated. All sample packages shall be marked "Sample for Procurement Office, Bid No. ___" and each sample shall be tagged or marked. Failure of the bidder to clearly identify samples as indicated may result in rejection of bid. The College reserves the right to test any materials, equipment or supplies delivered to determine if the specifications have been met. Samples will not be returned.

28. SIGNATURE: Each bid must show the full business address and telephone number of the bidder and be signed by the person or persons legally authorized to sign such contracts. All correspondence concerning the bid and contract, including the bid summary, copy of contract, and purchase order, will be mailed or delivered to the address shown on the bid. NO BID WILL BE ACCEPTED WITHOUT ORIGINAL SIGNATURE.

29. TAXES: The College is exempt from Federal and Maryland taxes. Exemption Certificates are available upon request. Bidder shall be responsible for the payment of any and all applicable taxes resulting from any award and/or any activities hereunder, including but not limited to any applicable amusement and/or sales taxes.

30. TERMINATION BASED ON LACK OF FUNDING: Any contract awarded as a result of this solicitation will be subject to funding and continued appropriation of sufficient funds for the contract. For purposes of this solicitation, the College's appropriating authority is deemed to be the Board of Trustees of Montgomery Community College. Insufficient funds shall be grounds for immediate termination of this solicitation.

31. TERMINATION FOR DEFAULT: If an award results from this bid, and the contractor has not performed or has unsatisfactorily performed the contract, payment shall be withheld at the discretion of the College. Failure on the part of the contractor to fulfill contractual obligations shall be considered just cause for termination of the contract and the contractor is not entitled to recover any costs incurred by the contractor up to the date of termination.

32. TERMINATION FOR THE CONVENIENCE OF THE COLLEGE: The performance of the work or services under a contract as a result of this solicitation may be terminated in whole or in part, whenever the President of Montgomery Community College shall deem that termination is in the best interest of the College. Such determination shall be in the sole discretion of the President. In such event, the College shall be liable only for payment in accordance with the payment provisions of the contract for work or services performed or furnished prior to the effective date of termination. Termination hereunder shall become effective by delivery to contractor of written notice of termination upon which date the termination shall become effective.

33. WARRANTY: Bidder expressly warrants that all articles, material and work offered shall conform to each and every specification, drawing, sample or other description which is furnished to or adopted by the College and that they will be fit and sufficient for the purpose intended, merchantable, of good material and workmanship, and free from defect. Such warranty shall survive a contract and shall not be deemed waived either by the College's acceptance of said materials or goods, in whole or in part, or by payment for them, in whole or in part. The bidder further warrants all articles, material and work performed for a period of one year, unless otherwise stated, from date of acceptance of the items delivered and installed, or work completed. All repairs, replacements or adjustments during the warranty period shall be at bidder's sole expense.

INSTRUCTIONS TO CONTRACTORS

PART 1 - RFP AND AWARD SCHEDULE

1.1 REQUEST FOR PROPOSAL SCHEDULE

It is the College's intent to administer the Request for Proposal process for this project according to the schedule dates outlined below. The College reserves the right to alter schedule dates as may be determined necessary in the College's best interests.

April 13, 2026	Advertised on eMaryland Marketplace and RFP Documents Available on the College Procurement Website
April 17, 2026	Pre-Proposal Meeting and Site Visit
April 22, 2026	Last Date to Submit Requests for Information by 5:00 p.m.
May 13, 2026	**Submission of Technical Proposal and Price Proposal due at 2:00 p.m.**
June 15, 2026	Proposal Evaluation Process Concludes and Recommendation of Award to be approved by the College Board of Trustees

1.2 AWARD SCHEDULE

It is the College's intention to seek approval of award recommendation by the College Board of Trustees at the **June 15, 2026** meeting, and the award is subject to approval by the Board of Trustees.

Notice to proceed will be timely provided upon receipt of documentation and information required from the Contractor before the start of work including, but not limited to, performance, payment, labor and material payment bonds and Insurance certificates.

Notwithstanding these expectations, the College may require additional time to administer the contract award or other processes. To accommodate this possibility, prices must remain firm for ninety (90) days from the proposal due date. Anticipated Contract Award date, Notice to Proceed date and project scheduling expectations may be adjusted in concert with this provision. It is the Contractor's sole responsibility to ensure their price proposal response accommodates this requirement.

PART 2 - PRE-PROPOSAL CONFERENCE

2.1 A Pre-Proposal Conference will be held at **10:00 am, April 17, 2026, in Room 302, Charlene R. Nunley Student Services Center** on the Takoma Park/Silver Spring Campus located at 7600 Takoma Avenue Takoma Park, Maryland 20912**.** Attendance by Contractors is strongly encouraged but is not required. A mandatory site inspection opportunity will be provided immediately following the Pre-Proposal Conference. Contractors will be able to satisfy the required Verification of Examination of Site Conditions obligation associated with this proposal by attending that site inspection.

A campus map showing the location of the Pre-Proposal meeting is in Appendix A.

It is each Offeror's responsibility to become familiar with all information necessary to prepare a proposal. Failure to do so will not relieve the successful Offeror of the obligation to carry out the provisions of the Contract. Data in the RFP documents pertaining to existing conditions and site locations is for convenience only to inform Offerors of the existing building conditions.

PART 3 - RFP DOCUMENTS

3.1 RFP documents include the Invitation Letter of RFP, Instructions to Contractors, Supplementary Instructions to Contractors, Required Submissions, Information Available to Contractors, ,Technical Proposal Form, Price Proposal Form and attachments thereto, Bid Bond, Verification of Examination of Site Conditions, Contractor's Qualification Statement, Subcontractor Information Form, Minority Participation Form, Procurement Office Questionnaire, Conflict of Interest Statement, Non-Debarment Acknowledgement, Montgomery College Standard Performance Bond, Labor and Material Payment Bonds, Application and Certificate for Payment, Montgomery College Standard Form of Contract, Montgomery College General Conditions of the Contract, Montgomery College Supplementary Conditions of the Contract, Specifications, Drawings, State of Maryland Prevailing Wage Rates Determination and all Addenda if applicable.

3.2 An electronic PDF of the RFP documents can be downloaded from the College Procurement website at http://www.montgomerycollege.edu/procure/ .

3.3 Montgomery College is not responsible for content of and/or information obtained from sources not listed in the RFP. Only information obtained through the College's Procurement Office, on its website or from sources listed in the RFP should be considered reliable. It is highly recommended that Offerors obtain all information pertaining to this RFP from the College's Procurement website at http://www.montgomerycollege.edu/procure/ and those sources referred to in the RFP document. It is the Offeror's responsibility to assure that accurate information has been used in preparation of their proposal response.

PART 4 - SITE EXAMINATION

4.1 A site examination opportunity will be provided at the project site on **April 17, 2026**, right after the Pre-Proposal Meeting. Additional site visit may be accommodated no later than **April 22, 2026** by contacting Alan Yanaway, Project Manager, via email to Alan.yanaway@montgomerycollege.edu

4.2 Potential Contractors shall thoroughly examine and investigate existing site conditions that may affect their pricing proposals, prior to proposal submission. Site examination is mandatory and verification of the examination by a college representative is required. The price proposal shall be firm and final, no adjustments shall be granted at a later date, if contractors fail to account for site variances.

4.3 Contractors MUST attach the Verification of Examination of Site Conditions form, which is included in Section 004400 and is to be signed by an authorized College Representative upon the completion of site examination and include it in the Technical Proposal (Part A) submission.

4.4 Proposal submission shall serve as verification that, at the time of receipt of the proposal by the College, the Contractor has inspected the site and has read and is thoroughly familiar with the RFP documents (including all Addenda); has examined and finds the Specifications and the Drawings adequate; and agrees that given what the Specifications and Drawings require, in any part of the Work, the required result can be produced. Failure or omission of a Contractor to inspect the site or to examine any form, instrument or document shall in no way relieve a Contractor from obligations with respect to their Proposal.

4.5 Data in the RFP documents pertaining to existing conditions is for convenience only and does not supplant obtaining first-hand information at the site. Submission of proposals shall constitute acceptance by the Contractor of existing site conditions as a part of the requirements for this work.

PART 5 - INTERPRETATION OR CORRECTION OF RFP DOCUMENTS

5.1 The RFP documents should be examined carefully. Should any Contractors find discrepancies or omissions in the solicitation documents, or be in doubt as to the meaning of any item(s), Request for Clarification related to RFP documents shall be submitted to Yu (Judy) Zhu, Purchasing Manager, via email to yu.zhu@montgomerycollege.edu.

5.2 Contractors shall be responsible for reviewing and coordinating the submission of clarifications requested by Subcontractors or Vendors. Clarification requests made directly by Subcontractors or Vendors will not be accepted by the College.

5.3 Request for Clarifications must be submitted by email no later than **5:00 p.m. on April 22, 2026.**

5.4 No oral interpretation of the meaning of the RFP documents will be made to any Contractor, and oral responses or oral interpretations will not be binding in any way to modify or change any requirement in the RFP documents.

5.5 The College will review the written questions and requests for clarification, if any, and all such interpretations and any supplemental instructions will be issued in the form of written Addenda to the RFP. Any issued Addenda may be obtained by downloading the file from the College's Procurement website http://www.montgomerycollege.edu/procure at no charge.

5.6 All Addenda shall become part of the RFP documents.

5.7 Notification regarding addenda posted at the above referenced website will be provided by email, to all Contractors who are known by the College to have received a complete set of Proposal Documents by downloading the RFP from the College's Procurement website and who have provided an accurate current e-mail address. To ensure that an accurate notification attempt can be made, and is delivered to the appropriate contact person, the College requests the Contractor register one person's contact information with the College's website. The College will make a good faith, one-time, attempt to e-mail the notification to that contact person, but cannot be held responsible for unsuccessful delivery if an incorrect e-mail address is provided and/or technical difficulties are experienced in the transmission.

5.8 It is the Offeror's sole responsibility to ensure receipt of all Addenda. It is highly recommended that all Offerors check the College's website for all posted Addenda prior to submitting their proposals. All Addenda shall become part of the Request Proposal documents.

5.9 Failure of any Offeror to receive any such Addenda or interpretation shall not relieve the Offeror from any obligation or requirement provided for in the Addenda or issued interpretation.

PART 6 – PROPOSAL PREPARATION AND SUBMISSION

6.1 A submittal consisting of the Technical Proposal and the Price Proposal is required when responding to this RFP.

6.2 Offerors are required to submit:

- **One (1) original hard copy of Technical Proposal including all attachments,** with original ink signatures; plus, one electronic copy of complete Technical Proposal submission saved as one PDF file on clearly marked USB flash drive.

- **One (1) original and one photocopy of Price Proposal submission including all attachments.** The cover page of each copy should be clearly marked "original" or "copy" accordingly.

It is the sole responsibility of the Offerors to make sure that the electronic copy of Technical Proposal shall be identical to the original hard copy.

6.3 The hardcopy of Technical Proposals and Price Proposals must each be submitted in separately sealed envelope/box, one containing the Technical Proposal (Part A) submission and the second containing the Price Proposal (Part B) submission.

6.4 Proposals must be submitted on the enclosed Proposal Forms and must include all the attachments listed. Offers may use their own forms if any required submission forms are not provided in the RFP documents. Proposals must be signed by an authorized officer of the firm. Blank spaces must be filled in, either in ink or typewritten, both in words and figures. The person signing the Proposals must initial all erasures on or changes to the forms.

6.5 Submitted proposal responses, will not be returned to the Offerors. Proposals must include all required information. All proposal packages submitted in response to this RFP shall be certified, signed, and dated by a bona-fide agent of the Offeror, and include minority classification, if applicable.

6.6 Offerors must copy the package sample label below and paste it on the outside of each sealed proposal package. It is mandatory that the proposal envelope labels are used, or this exact information is provided on the envelopes of the sealed proposal. Failure to do so may cause the proposal to be rejected.

PROPOSAL ENVELOPE LABELS

PART A - TECHNICAL PROPOSAL

RFP No.:	626-004 (Part A)
Proposal Due Date and Time:	**2:00 PM on May 13, 2026**
Offeror's Name:	_____
Offeror's Address:	_____
Project Title:	East Garage Fire Alarm Upgrade (Phase 3) Takoma Park/Silver Spring Campus

PART B – PRICE PROPOSAL

RFP No.:	626-004 (Part B)
Proposal Due Date and Time:	**2:00 PM on May 13, 2026**
Offeror's Name:	_____
Offeror's Address:	_____
Project Title:	East Garage Fire Alarm Upgrade (Phase 3) Takoma Park/Silver Spring Campus

6.7 Any proposal received after the closing time and date specified, or at a different location other than specified above will not be opened or given any consideration.

6.8 Oral, emailed, or faxed proposals are invalid and will not be accepted or considered.

6.9 All costs incurred by responding firms associated with the preparation, submission, presentation or proposals and attendance at meetings, including but not limited to, costs related to transportation, meals, lodging, bonding, and other related expenses, if applicable, will be the sole responsibility of the Offerors, and will not under any circumstances by reimbursed by the College.

PART 7 - DELAYED OPENING

7.1 No proposal will be accepted after the stated closing date and time. In the event the College is closed on the RFP closing date due to an unforeseen circumstance, the RFP will close at the stated time on the next open business day, unless the Contractor is notified otherwise.

PART 8 - ERRORS IN PROPOSALS

8.1 With the submission of their proposals, Contractors assure the College that they are fully informed regarding conditions and requirements of the project site and the RFP documents prior to submitting proposals. Contractors are responsible for seeking proper information and making the necessary investigations. Failure to do so is at the Contractor's sole risk.

PART 9 - WITHDRAWAL OF PROPOSALS

9.1 Offerors may not withdraw or modify the Proposals for ninety (90) calendar days after the RFP closing date and time.

9.2 The College may require additional time to administer College, County and/or State contract award or other regulatory processes. To accommodate this possibility, prices must remain firm for ninety (90) days from the price proposal due date. Anticipated Contract Award date, Notice to Proceed date and project scheduling expectations may be adjusted in concert with this provision. It is the Contractor's sole responsibility to ensure that their price proposal response accommodates this requirement.

PART 10 - EVALUATION OF PROPOSALS

10.1 The evaluation of proposals includes both Technical Proposal (Part A) and Price Proposal (Part B) evaluation.

10.2 The contract will be awarded in consideration of Technical Proposal and Price Proposal and the substantiated ability of the apparent highest overall scoring Offeror to perform the required construction services described in the RFP documents.

10.3 Technical Proposals will be opened first and evaluated by the College Evaluation Committee based on the substantiated ability of the Offeror to perform the required construction services described in the RFP documents and the Offeror's responsiveness to the Technical Proposal requirements. Price Proposals from only those Offerors who are deemed qualified following the review of the Technical Proposals, will then be opened, and reviewed. Price Proposals from those Offerors deemed not qualified after the review of the Technical Proposals will not be opened.

10.4 Evaluation Criteria

A. Technical Proposal (Part B): 60% of Total Score

Offeror's Technical Proposal will be evaluated by the College Technical Evaluation Committee based on Offeror's responsiveness to the following key areas:

- Contractor Qualification Statement including Financial Statements
- Relevant Project Experience
- Subcontractor's Information Form(s)
- Professional Qualifications and Technical Competence of Proposed Project Team
- Project Approach Statement
- Quality Control Program

- Administrative Process Methodology
- Proposed Project Schedule Outline
- Verification of Examination of Site Conditions
- Exceptions to the General and Supplementary Conditions of the Contract, Montgomery College Standard Form of Contract, and/or any other deviations to the RFP documents, if applicable
- Conflict of Interest Form
- Non-Debarment Acknowledgement

B. Price Proposal (Part B): 40% of Total Score

Price Proposals from only those Offerors who are deemed qualified following the review of the Technical Proposals, will then be opened, and examined for responsiveness and responsibleness by the College Procurement Office. To be considered for the award, Offeror must bid all line items in the Price Proposal Form and fill out all blanks. Failure to do so may deem an offer non-responsive.

Contractor's Price Proposal will be evaluated based on the following:

a. Base Price Total plus accepted, if any, Add Alternates
b. Submission of an acceptable Bid Bond (required if the total bid amount exceeds $100,000)
c. Bonding Company Letter Guaranteeing the Required 100% Performance, Labor and Material Payment Bonds

Offeror's Price Proposal will be evaluated with the lowest responsive and responsible proposal price awarded the highest point score. Other proposal prices will be awarded reduced point scores, determined by ratio comparing the proposed price to the lowest responsive and responsible proposal price.

PART 11 - AWARD CONSIDERATIONS

11.1 An award will be recommended in the best interest of the College to the Offeror achieved the highest combined scores of technical and price proposal evaluations, who can meet or exceed the terms, conditions, and specifications of this solicitation, including project delivery requirements. It is the College's intention to seek approval of award of this contract at the College's Board of Trustees **on June 15, 2026** and is subject to approval by the Board of Trustees. Only alternates submitted by the recommended Contractor may be reviewed and considered by the College. The College reserves the right to negotiate the pricing, and to accept or reject any alternate pricing.

11.2 The award will be made subject to the availability of public funds and only if it is in the best interest of the College to award the project. The College reserves the rights to exercise the following rights at the College's sole discretion.

PART 12 – COLLEGE'S RIGHTS

12.1 The College reserves the following rights to be exercised at the College's sole discretion:

A. To make such investigation as deemed necessary to determine the qualifications of the Contractor and to determine the ability of the Contractor to perform the work. The Contractor shall furnish to the College all such information and data as the College may request. The College reserves the right to reject any proposal if the evidence submitted by, or investigation of, such Contractor fails to satisfy the College that such Contractor is properly qualified to carry out the obligations of the contract and to complete the work contemplated herein.

B. Conditional proposals will not be accepted.

C. To reject any or all proposals and to make awards in the best interest of the College, in the name of the Board of Trustees. The College also reserves the right to cancel the RFP.

D. To accept or reject any item of price proposal or any alternate prices in the priority order established by the Price Proposal Form.

E. To consider informal, any proposal not prepared or submitted in accordance with the provisions hereof. The College may at its sole discretion waive any informality. A waiver of any provision of the RFP Documents shall not constitute a waiver of any subsequent breach.

F. To defer award of the Contract for a period of up to ninety (90) calendar days after closing of the RFP. Anticipated Contract Award date, Notice to Proceed date and project scheduling expectations may be adjusted in concert with this provision. It is the Contractor's sole responsibility to ensure their proposal response accommodates this requirement. Upon Award, prices must remain firm for the duration of the contract.

G. If no award or other disposition is made, the expiration of the ninety (90) calendar days will constitute rejection of all proposals without any further action by the College.

H. The Contractor deemed most responsible and responsive with the highest combined scores in technical and price proposal evaluation will be recommended for contract award to the College's Board of Trustees. The College reserves the right to negotiate the base price total with the highest scored responsive and responsible Offeror, if it is deemed to be in the best interest of the college.

PART 13 - REGISTRATION OF CORPORATIONS NOT REGISTERED IN THE STATE OF MARYLAND

13.1 Pursuant to 7-202 et. Seq. of the Corporation and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State of Maryland shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201 before doing any interstate or foreign business in this State. **Corporations must be registered, and in good standing no later than proposal submittal deadline date**. A copy of the registration or application for registration may be requested by the College.

PART 14 – PUBLIC RECORD AND PROPRIETARY INFORMATION

14.1 As a public entity, the College is subject to the disclosure requirements in the **Maryland Public Information Act ("MPIA"),** Title 4 of the General Provisions Article of the Annotated Code of Maryland. Information that is deemed to be confidential commercial or financial information, as defined by the MPIA, may be exempted from disclosure. Offeror's must clearly identify each part of the Offer that it believes contains confidential commercial or financial information by stamping the top right-hand corner of each pertinent page with large red bold letters stating the words "confidential" or "proprietary". It is not sufficient to preface your proposal with a proprietary statement, or to use a page header or footer that arbitrarily marks some or all pages as confidential. General claims of confidentiality or similar blanket designations shall not be effective. Each Offeror must submit a proprietary and confidential redacted copy of its proposal to be used in responding to MPIA requests.

14.2 Offeror agrees that upon request from the College, it will provide justification as to why any material, in whole or in part, should be considered confidential, proprietary information or trade secrets and provide any justification of why such materials should not be disclosed pursuant to a request under the MPIA. The College, by law must apply the MPIA requirements for public information disclosure deemed proprietary and/or confidential; therefore, even the information marked as such by the Offeror may still require public disclosure. Offeror agrees that any portion of the proposal that is not stamped as proprietary or confidential is not proprietary or confidential and may be disclosed upon request under the MPIA.

PART 15 – CONFIDENTIALITY

15.1 The Contractor agrees to maintain in strict confidence Montgomery College's confidential information as listed herein. The Contractor may use the College's confidential information solely to perform the services required, as listed herein and may not disclose such information to any person or entity without the expressed written consent of Montgomery College.

15.2 The information contained in Offeror's proposals submitted for the College's consideration will be held in confidence until all evaluations are concluded and an award has been made. Pricing and other information that is an integral part of the offer cannot be considered confidential after an award has been made. Offeror's must clearly mark any information considered proprietary and confidential. The College will honor requests for confidentiality for information of a proprietary nature. Pricing may not be deemed confidential.

PART 16 - MULTIPLE/ALTERNATIVE PROPOSALS

16.1 Multiple and/or alternate Proposals will not be accepted.

PART 17 – POST AWARD DEBRIEFINGS

17.1 Debriefing of an unsuccessful Offeror will be conducted upon written request submitted to the purchasing agent within ten (10) days of the announcement of the recommended award. This debriefing will be oral and be limited to a discussion of the unsuccessful firm's proposal only and will provide information on areas in which it was deemed weak or deficient.

PART 18 - NOTIFICATION OF CHANGE IN PERSONNEL ASSIGNED TO CONTRACT

18.1 Awarded contractor must notify Montgomery College of any changes in personnel assigned to contract, that may impact level of services provided by contractor. Notification must be provided throughout life of contract, and within (7) seven business of a change in personnel assigned to contract. Failure to notify Montgomery College may result in termination of contract.

PART 19 - NOTIFICATION OF CHANGE IN FINANCIAL CONDITION

19.1 Awarded contractor must notify Montgomery College of any change in company's financial condition that could negatively impact the level of services or products provided by contractor. Notification must be provided throughout life of contract, and within (7) seven business days of change in company's financial condition. Failure to notify Montgomery College may result in termination of contract.

PART 20 – MARYLAND LAW

20.1 The resultant contract shall be construed and interpreted according to Maryland Law. Venue under this contract, shall be in a court of competent jurisdiction of Montgomery County, Maryland.

END OF INSTRUCTIONS TO CONTRACTORS

SUPPLEMENTARY INSTRUCTIONS TO CONTRACTORS

PART 1 – PRELIMINARY PROJECT SCHEDULE

1.1 Preliminary schedule instructions apply to the project as follows:

A. The College offers classes during traditional Fall and Spring academic semesters, as well as during a winter intersession and two summer session periods. Contractor is reminded that they may be asked to refrain from noisy work during the associated testing periods when tests are scheduled in adjoining buildings. Specific calendars and constraints will be provided by the College when available. Calendars are subject to adjustment in the event that inclement weather, or other cause, closes the College.

B. The College anticipates that the project will be complete and fully operational by the following milestone dates administered by the College, concurrent with the Contractor's completion of the project as follows:

1) Notice to Proceed: July 1, 2026
2) Substantial Completion: January 08, 2027
3) **Final Completion: January 22, 2027**

PART 2 – PREVAILING WAGES

2.1 With regard to General Condition 3.3.1.3, **please note that <u>this project is NOT subject to State of Maryland DLLR Prevailing Wage Rate requirements.</u>**

PART 3 – MINORITY PARTICIPATION

3.1 Pursuant to Section 16-311(7) of the Education Article and Board Resolutions #87-82 and #87-83, adopted on July 20, 1987, it is the policy of Montgomery College to encourage the participation of responsible certified minority business enterprises to provide goods and services for the performance of College projects. "Minority business enterprise" has the meaning stated in Section 14-301 of the State Finance and Procurement Article and means a legal entity, except a joint venture, that is: (1) organized to engage in commercial transactions; (2) at least 51% owned and controlled by one or more individuals who are socially and economically disadvantaged; and (3) managed by, and the daily business operations which are controlled by, one or more of the socially and economically disadvantaged individuals who own it. A "socially and economically disadvantage individual" means a citizen or lawfully admitted permanent resident of the United States who is in any of the following minority groups: African American, American Indian/Native American, Asian, Hispanic, physically or mentally disabled, women, or a group (e.g., LGBTQIA+) otherwise found by the certification agency to be a socially and economically disadvantaged individual.

3.2 All Offerors must submit an updated Minority Participation Form and include in the Technical Proposal submission.

3.3 If the Contractor is not a minority business entity, the Contractor is encouraged to develop a plan that, at a minimum, will award **15% of the total contract value** to subcontractors and/or vendors that are minority businesses.

3.4 Non-minority Contractors are advised that following contract award, within three business days of request by the College, the Contractor shall provide a list indicating minority subcontractor and/or vendor participation anticipated for the project. The Contractor shall provide the College with routine updates should any changes in subcontractor or vendor status occur during the contract term.

PART 4 – BONDS

4.1 If Contractor's total bid amount exceeds $100,000, Contractor is required to furnish a Bid Bond and a Letter of Intent from its Bonding Company for East Garage Fire Alarm Upgrade Phase 3 on the Takoma Park/ Silver Spring Campus with the Price Proposal (Part B) as required below.

4.1.1 Contractor shall submit **one original and one copy of a Bid Bond** from a surety company authorized to do business in the State of Maryland, acceptable to the College, made payable without condition to the College, or a cashier's check, in the amount of **not less than 5% of the total base bid amount, including all bid alternates, but excluding all deduct alternates.** Bid Bond shall be prepared and submitted on **AIA Form A310-2010, "BID BOND".**

4.1.1 Contractor shall submit **one original and one copy of a letter from the Contractor's bonding company** stating that it guarantees to furnish the required 100% performance and labor and material payment bonds if the Contractor is recommended for contract award. Letter provided shall not be generic but must be written specifically for this project.

4.2 Prior to the execution of this Contract, the successful Contractor is required to furnish a performance bond, properly executed on the **Montgomery College Standard Performance Bond**, a copy of which is included in the Request for Bid documents, and a labor and material payment bond executed on **AIA Document A312-2010, "PAYMENT BOND",** for 100% of the amount of the Contract.

4.3 Upon failure or refusal to execute and deliver the Contract and bonds required within five (5) days (Saturdays, Sundays and legal holidays excluded) after having received notice of acceptance of its proposal, the Contractor shall forfeit to the College, as liquidated damages for such failure or refusal, the bid security included with its proposal.

4.4 After the College and the successful Contractor have executed a contract, or if no contract has been executed within ninety (90) calendar days after the proposal due date, and Contractor has not been notified of acceptance of its bid, Contractor may request return of his Bid Bond.

4.5 If at any time, the bonding Company becomes insolvent, files for bankruptcy or for any reason whatsoever loses its right to do business in the state of Maryland, the Contractor shall, within ten (10) calendar days after notice from the College to do so, substitute an acceptable Bond (or bonds) in such form and sum and signed by such other Bonding Company as may be satisfactory to the College.

4.6 Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond, a certified and effectively dated copy of their power of attorney.

PART 5 – INSURANCE

5.1 Prior to start of any work, the successful Contractor must provide sufficient evidence of insurance showing adequate coverage as defined in the RFP documents.

PART 6 – FORM OF CONTRACT AND EXCEPTIONS/DEVIATIONS TO THE RFP REQUIREMENTS

6.1 The Contract Agreement between the successful Offeror and the College for the East Garage Fire Alarm Upgrade Phase 3 on the Takoma Park/Silver Spring Campus project will be executed on the College Standard Form of Contract, a copy of blank form is included in the RFP documents.

6.2 Contractor(s) should use the College's form of Contracts and terms and conditions and are discouraged from taking exception to provisions of a solicitation. Use of Contractor prepared Contracts and exceptions to provisions of a solicitation are not preferred, and must be reviewed and approved by the college prior to recommendation of award. Vendors insisting on the use of their form of Contract may be found to be non-responsive or to not meet the College's minimum qualifications for a solicitation.

6.3 **Any exceptions to the Montgomery College standard Form of the Contract, Montgomery College General and Supplementary Conditions of the Contract, or any deviations to the other RFP requirements, if any**, **must be submitted and included in the Technical Proposal (PartA)** to **initiate further consideration by the College, and subject to the College's approval.**

6.4 An exception submitted by the Contractor is considered the *request for information* by the College. The College makes no implicit or explicit statement as to any willingness to deviate from all requirements set forth in the RFP documents.

6.5 Unless explicitly stated by the Contractor in the proposal submission that an exception to the Montgomery College General and Supplementary Conditions of the Contract, College Standard Form of the Contract, and/or any deviation to the RFP requirements are a condition of the proposal, the College does not consider such exceptions provided by the Contractor to be the submission of a conditional proposal. **The College, at its sole discretion, may reject any exception or deviations and declare such proposal unacceptable and non-responsive.**

PART 7 – LIST OF SUBCONTRACTORS (UPON REQUEST)

7.1 Contractor shall provide names, addresses, Maryland registration/license number, and indication of minority status (if applicable), for all the Electrical sub-contractor proposed to be retained by the Contractor for this project, regardless of anticipated contract value.

PART 8 – VENDOR QUALIFICATIONS (UPON REQUEST)

8.1 The College's intent with regard to verification of Vendor qualifications, and financial stability is that it is the Contractor's responsibility to evaluate the qualifications, financial viability and solvency of all vendors used for the project.

8.2 Within three (3) business days from the request by the College, Contractor shall submit to the College a Qualification Statement for each Principal Vendor, herein defined as those Vendors whose contract value is anticipated to exceed $ 100,000, to include the following:

a) Name
b) Address
c) Type of Work Performed
d) Years in Business
e) Representative Project List (including at least three projects of similar size, scope and complexity)

f) References (list at least three references, including contact name and telephone number)
g) Copy of Maryland registration/license number, if applicable

8.3 The College reserves the right to reject any Vendor.

PART 9 – TAXES

9.1 In the event of a conflict between General Conditions and any other provision in the Request for Proposal documents relating to taxes, Article 3.5 of Section 007200 Montgomery College's General Conditions of the Contract shall prevail.

PART 10 – LAWS AND REGULATIONS

10.1 The Contractor's attention is directed to the fact that all applicable Federal and State laws, County, Bi-County, local, and municipal ordinances, and the orders, rules and regulations of all authorities having jurisdiction over this work shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

PART 11 – DEBARMENT

11.1 Any Offeror as an individual or as an organization, presently debarred, suspended, proposed for debarment by any County, State, or Federal departments or agencies will be declared ineligible to respond to the proposed contract. The Contractor shall not enter into any subcontract with any individual, firm or organization debarred from doing business with government agencies.

11.2 Submission of a signed proposal in response to this solicitation is certification that an Offerer (or any sub-contractors) is not currently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any County, State, or Federal departments or agencies. Submission is also the agreement that the College will be notified of any change in this status.

END OF SUPPLEMENTARY INSTRUCTIONS TO CONTRACTORS

REQUIRED SUBMISSIONS

TO: PROSPECTIVE OFFERORS

FROM: PROCUREMENT OFFICE
MONTGOMERY COLLEGE

A submittal consisting of the Technical Proposal and the Price Proposal is required when responding to this RFP. Offerors are required to submit:

- **One (1) original hard copy of Technical Proposal including all Attachments,** with original ink signatures; plus, one electronic version of complete Technical Proposal submission saved as one PDF file on clearly marked USB flash drive.

- **One (1) original and one photocopy of Price Proposal, including all Attachments, each marked "original" or "copy" accordingly.**

Technical Proposal and Price Proposal submission must be submitted **in two separately sealed envelopes/ boxes**, one containing the Technical Proposal (Part A) submission and the second containing the Price Proposal (Part B) submission. Each envelope/box must be clearly marked Technical Proposal or Price Proposal, Offeror's name and address, RFP number and descriptions, as well as RFP closing date and time; and be addressed to:

Office of Procurement
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

Proposals shall be submitted on the enclosed Proposal Forms with required attachments, if any and properly signed. Offerors may use their own forms if any required submission forms are not provided in the RFP documents. It is the responsibility of the Offerors to make sure that electronic version of technical proposal shall be identical to the original hard copy. Failure to include any of the required submission may render the proposal non-responsive and the Offer may be rejected.

PART 1 - ITEMS REQUIRED FOR TECHNICAL PROPOSAL (PART A) SUBMISSIONS

Technical proposal submission shall include and be organized as follows:

1.1 Technical Proposal Form, Section 004213 A

1.2 Attachments specified in Technical Proposal Form Section 004213A, including:

a) Contractor's Qualification Statement, Section 004513

b) Financial Statements as required in Contractor's Qualification Statement

Contractor is required to provide copies of financial statements for the last two years, preferably audited, including your organization's balance sheet and income statement showing Current Assets, Net Fixed Assets, Other Assets, Current Liabilities and Other Liabilities. Include name and address of firm preparing attached financial statement(s), and date(s) thereof.

Information provided in the Financial Statements is for the express purpose of assisting Montgomery College in its assessment of the Contractor's suitability for providing services as a Contractor for the referenced project.

c) A copy of Contractor's business license and Contractor's License

d) Subcontractor Information Form(s), Section 004513 I

1) Contractor shall use Subcontractor Information Form per Section 004513-I and submit up to **three prospective key principal subcontractors'** information per each trade category.

The key principal trade is Electrical Services.

2) Subcontractor Information collected will be used as a basis of discussion during evaluation of Contractor's Technical Proposal to amplify the College's understanding of the Contractor's approach to assembling an appropriately qualified and experienced project team for the work.

3) Subcontractor Information does not obligate the successful Contractor to restrict subcontract award to one of the subcontractors named on each Form.

4) The College reserves the right to reject any Subcontractor.

e) Contractor's Relevant Project Experience

Submit **three (3)** of the relevant project references of similar scope, size and complexity completed within the **past three years**. **Two (2)** of the project references shall be within the Metropolitan Baltimore-Washington areas. Only one (1) prior Montgomery College project may be used for reference.

Provide a brief description of the scope of work and list each project's size, relevant features, construction cost (including general conditions, OH&P), change order value (excluding or annotating Owner directed scope changes), anticipated schedule, actual schedule and an Owner's reference contact person's name and current telephone number. Please make sure the references and contact persons are current. Use separate sheets if necessary and include these with the submission.

f) Proposed Project Management/Supervisory Personnel List (including Construction Superintendent) and their Professional Qualifications and Technical Competence

Contractor shall list the names and describe previous experience by the overall Construction Superintendent and the personnel who will be assigned to the College's project in providing project management and supervision services for construction projects of similar size, complexity and scope together with a statement as to the extent to which these personnel will be full-time or part-time.

1) Submit resumes and/or other relevant information demonstrating the qualifications and technical competence of proposed project team members working onsite including, at a minimum:

- Project Manager
- Project Superintendent. The Superintendent must be on-site 100% of the time for the duration of construction.

2) Demonstration that team members have prior work experience together is preferred.

3) Demonstration that team members have prior work experience on comparable projects for academic institutions and/or with electric and fire alarm infrastructure projects is preferred.

4) Indicate expected percentage (or range) of time each team member will devote to the project.

g) Project Approach Statement
Submit a statement outlining your anticipated approach to the project, including the following:

1) How do you plan to execute the project?

1) Explain your approach to site mobilization and sequencing of the work.

2) Identify special areas of concern you feel may merit additional monitoring during construction and explain how you would provide for those special needs.

h) Quality Control Program
1) Submit a statement outlining the process by which you will assure compliance with the Proposal Documents.

2) Explain how your site housekeeping and maintenance procedures, management of temporary conditions and/or constraints and sequencing of trades affect quality control outcomes.

i) Administrative Process Methodology
1) Submit a statement outlining your standard administrative processes.

2) Expand the roles and responsibilities of team members, if not sufficiently addressed in above items (e) or (f).

3) Indicate preferred mechanics for:
- preparing schedules and schedule updates
- managing and monitoring submittals
- managing and monitoring requests for information
- maintaining accurate records on-site
- documenting change events
- preparation of applications for payments and change orders
- punch list preparation and monitoring punch list completion
- compilation and submission of closeout materials

j) Acknowledgement of Proposed Project Schedule
Include a letter acknowledging review and acceptance of the Proposed Project Schedule as outlined in Part 1 of Section 002213, Supplementary Information to Contractors. Include a critical path project schedule in gnatt chart form. Submit an alternative schedule for the project if not in agreement with this proposed schedule.

k) Verification of Examination of Site Conditions, Section 004400-1

l) Minority Participation Form per Section 004539

m) Conflict of Interest Form, Section 004541

n) Non-Debarment Acknowledgement, Section 004542

l) Acknowledgement of Receipt of Addenda, if applicable

o) Any exceptions and/or deviations to the RFP documents, if applicable

PART 2 – ITEMS REQUIRED FOR PRICE PROPOSAL FORM (PART B) SUBMISSIONS

2.1 Price Proposal Form, per Section 004213B

2.2 AIA Document A310-2010, Bid Bond

a) Contractor shall submit a Bid Bond from a surety company authorized to do business in the State of Maryland, acceptable to the College, made payable without condition to the College or a cashier's check, not less than 5% of the amount of the Base Price Total, including all add alternates, but excluding deduct alternates. Bid Bond shall be prepared and submitted on AIA Form A310-2010, "BID BOND".

2.3 Bonding Company Letter Guaranteeing the Required 100% Performance, Labor and Material Payment Bonds

a) Contractor shall submit a letter from the Contractor's bonding company stating that it guarantees it will furnish the required 100% performance and labor and material payment bonds if the Contractor is recommended for contract award. Letter provided shall not be generic, but must be written specifically for this project.

Note: *For any portion of your proposal that you reasonably believe is confidential commercial or financial information as defined by MPA, and described in Section 1 (Public Record and Proprietary Information) of this Request for Proposal, provide a duplicate copy of your technical and price proposal with proposed redaction of such information Failure to provide a duplicate redacted copy constitutes your acknowledgement that all information contained in your technical and price proposal is not confidential commercial or financial information.*

END OF REQUIRED SUBMISSIONS

INFORMATION AVAILABLE TO CONTRACTORS

1.1 GENERAL PROVISIONS

A. College records include documentation that is made available as information to Contractors to illuminate likely project conditions.

B. Reports, investigations, data, As-Built documentation, and all information related thereto included as Information Available to Contractors are not a part of the Contract Documents.

C. The College, Architect and Engineers do not guarantee continuity of conditions indicated and are not responsible for information contained or not contained in the Information Available to Contractors.

D. Contractors shall employ their own experts to analyze available information. Contractors shall be responsible for the consequences of acting on conclusions obtained from examination and analysis of available information.

E. Contractors will be responsible for any and all costs associated with obtaining copies of existing record or As-Built drawings. Costs associated with any request for this documentation will be determined by the College at the time of the request, and these costs must be paid for, prior to the release of any documentation to the Contractors.

1.2 BUILDING DOCUMENTATION

Contractors are advised that As-Built documentation is available as reference documents for all project worksites. Documentation may be examined by submitting a written request to:

Alan Yanaway, Project Manager
Email: Alan.yanaway@montgomerycollege.edu

END OF INFORMATION AVAILABLE TO CONTRACTORS

TECHNICAL PROPOSAL FORM

To: Montgomery College

Re: RFP No.: 626-004
East Garage Fire Alarm Upgrade (Phase 3)
Takoma Park/Silver Spring Campus

Attn.: Procurement Office
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

From: _____
(Provide Your Company's Name)

PART 1 - Offeror must submit one original hard copy and one electronic copy of the Technical Proposal Form (Part A) and all Attachments. Electronic copy of the technical proposal submittal must be saved as one PDF file on clearly marked USB flash drive.

It is the responsibility of the Contractors to make sure that electronic version of technical proposal submission shall be identical to the original hard copy.

PART 2 - Please read the questions, note what is requested, then provide appropriate responses. Failure to answer any of the applicable questions contained in this section will make the proposal non-responsive and be grounds for rejection of the entire proposal. Conditional proposals will not be accepted.

PART 3 - Contractor acknowledges receipt of the following Addenda:

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

PART 4 – The Contractor proposes to provide all of the necessary labor, materials, equipment, insurance and bonds for the East Garage Fire Alarm Upgrade Phase 3 on the Takoma Park/Silver Spring Campus located at 7600 Takoma Avenue, Takoma Park, Maryland 20912, as specified in the RFP documents. The work to be performed by the Contractor shall include all items accepted by the College as part of the Contractor's submittal. It is understood that Montgomery College (hereinafter referred to as College) will be the sole judge as to the acceptance of the proposals and award of the contract. All work shall be done in accordance with the accompanying Technical Specifications and Drawings for the amount listed on the Price Proposal Form, and accepted Alternates, if any, as applicable in accordance with the terms of the RFP documents**.** The Contractor is reasonably expected, given the existing conditions and required construction, to complete the Work within the completion date stated in the RFP documents**.**

PART 5 – TECHNICAL PROPOSAL SUBMITTAL ATTACHMENTS

Technical Proposal Form and all Attachments include:

A. Technical Proposal Form

B. Contractor's Qualification Statement, including Financial Statements

C. Copy of Contractor's Maryland Business Registration and Contractor's License

D. Key Principal Subcontractor Information Form

E. Relevant Project Experience

F. Key Supervisory Personnel

G. Project Approach Statement

H. Quality Control Program

I. Administrative Process Methodology

J. Project Schedule Statement and Critical Path Schedule

K. Verification of Examination of Site Conditions, Section 004400-1

L. Minority Participation Form, Section 004539-1

M. Conflict of Interest Form, Section 004541

N. Non-Debarment Acknowledgement, Section 004542

O. Any exceptions to the Montgomery College General and Supplementary Conditions of the Contract, Standard Form of Contract, and/or any deviations to the other requirements of the RFP, if any

P. Acknowledgement of Receipt of Addenda, if applicable

PART 6 – The undersigned agrees, if selected as the Contractor, to execute a Contract in accordance with the terms of this Request for Proposal and Contract documents**,** within five (5) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the College.

PART 7 - The undersigned further certifies under the penalties of perjury that this proposal is in every respect bona-fide, fair and made without collusion or fraud with another person, joint venture, corporation, partnership or other business or legal entity**.**

PART 8 - The undersigned acknowledges the right of the College in its sole discretion to accept any Proposal or to reject any or all Proposals.

PART 9 - SIGNATURES:

_____ _____
(Date) **(Company Name)**

_____
(Address)

_____
(Telephone Number)

_____
(Facsimile Number)

By: _____
SEAL IF A CORPORATION **Authorized Agent & Title (Print)**

_____
Signature

_____
(F.E.I.N.)

_____
(Contractor License Number)

_____
(Contact E-mail Address)

BE SURE TO SIGN YOUR PROPOSAL

PRICE PROPOSAL FORM

To: Montgomery College

Re: RFP No.: 626-004
East Garage Fire Alarm Upgrade (Phase 3)
Takoma Park/Silver Spring Campus

Attn.: Procurement Office
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

From: _____
(Provide Your Company's Name)

PART 1 - Contractor must submit **one (1) original plus one photocopy,** marked "Original " or "Copy" accordingly, of the Price Proposal Form and all attachments.

PART 2 - Please read the questions, note what is requested, then provide appropriate responses. Failure to answer any of the applicable questions contained in this section will make the proposal non-responsive and be grounds for rejection of the entire proposal. **Conditional proposals will not be accepted**. In order to be considered for the award, Contractor must bid all items and fill out all the following blanks. Failure to do so may deem a Contractor non-responsive.

PART 3- Contractor acknowledges receipt of the following Addenda:

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

Number_____Date_____

PART 4 - BASE PRICE TOTAL (State amounts in both words and numbers where indicated)

The proposed total contract amount to complete the construction services for the **East Garage Fire Alarm Upgrade (Phase 3) project on the Takoma Park/Silver Spring Campus**, per terms, conditions, drawings and specifications, including all costs associated with the requirements specified in the RFP documents, and having examined both the site of the Work and all matters referred to in the RFP documents, is:

(In Words): _____Dollars

(In Numbers): $ _____

Item #	Description	Dollar Amount ($)
1	Division 01 General Conditions	
2	Division 04 Masonry	
3	Division 07 Thermal & Moisture Protection	
4	Division 08 Openings	
5	Division 09 Finishes	
6	Division 23 Mechanical	
7	Division 26 Electrical	
8	Division 27 Communications	
9	Division 28 Fire Alarm	
10	Profit and Overhead	
11	Insurance, Performance & Payment Bonds	
12	**Base Price Total**	

PART 5 - SPECIAL PRICING REQUIREMENTS (State amounts in both words and numbers)

A. ALLOWANCES – NOT USED

B. UNIT PRICES - NOT USED

C. ALTERNATES - NOT USED

D. SEPARATELY IDENTIFIED PRICES – NOT USED

PART 6 - BID SURETY

A. The bid surety attached in the sum of _____ Dollars ($_____) is to become the property of the College in the event the Contract and Bond are not executed with the time set forth, as liquidated damages for the delay and additional expense to the College caused thereby**.**

B. The undersigned includes the following submissions as part of the Price Proposal Form**:**

- Bid Bond (AIA Document A310-2010, "Bid Bond") if the total bid amount exceeding $100,000.
- Bonding Company Letter

PART 7 – PRICE PROPOSAL SUBMITTAL ATTACHMENTS

A. AIA Document A310-2010, Bid Bond or Certified Check in an amount **not less than 5%** of the Total Bid Amount, including all add alternates, but excluding all deduct alternates, if applicable.

B. Bonding Company Letter Guaranteeing the Required 100% Performance, Labor and Material Payment Bonds.

PART 8 – The undersigned agrees, if selected as the Contractor, to execute a Contract in accordance with the terms of this Request for Proposals and the Contract Documents**,** within five (5) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the College.

PART 9 – Upon contract award, the undersigned agrees to hold prices firm for the duration of the overall contract term.

PART 10 - The undersigned acknowledges the right of the College in its sole discretion to accept any Proposal or to reject any or all Proposals.

PART 11 - The undersigned further certifies under the penalties of perjury that this proposal is in every respect bona-fide, fair and made without collusion or fraud with another person, joint venture, corporation, partnership or other business or legal entity**.**

PART 12 - SIGNATURES:

_____ _____
(Date) **(Company Name)**

_____
(Address)

_____
(Telephone Number)

_____
(Facsimile Number)

By: _____
SEAL IF A CORPORATION **Authorized Agent & Title (Print)**

_____
Signature

_____
(F.E.I.N.)

_____
(Contractor License Number)

_____
(Contact E-mail Address)

BE SURE TO SIGN YOUR BID

BID BOND

East Garage Fire Alarm Upgrade (Phase 3)
Takoma Park/Silver Spring Campus

Use AIA Document A310-2010, Bid Bond

VERIFICATION OF EXAMINATION OF SITE CONDITIONS

This form must be completed and included with the Technical Proposal submission.

The undersigned hereby certifies the completion of examination of the site conditions on _____, 2026.

_____ _____
Date **Company Name**

_____
Address

_____
Telephone Number

_____
Facsimile Number

_____
Name & Title (Print)

_____
Email Address

_____
Signature

Site examination inspection confirmed by College Representative:

_____ _____
Date **College Representative Name & Position**

_____
Signature

CONTRACTOR'S QUALIFICATION STATEMENT

Use **AIA Document A305, Contractor's Qualification Statement**, latest edition, or Montgomery College's "**Contractor's Qualification Statement**", unless otherwise indicated. A copy of the Montgomery College form and the supplemental instructions are included with this section.

MONTGOMERY COLLEGE

Contractor's Qualification Statement

Preparing the Contractor's Qualification Statement for Review by Montgomery College

Most contractors maintain a generic AIA A305 form. The effort contractors spend adapting the document to our specific interests is noticed and appreciated. The suggestions provided here are intended to help improve your chances of being responsive to our requests for technical information. Our preferences are fairly specific and adherence to these preferences will expedite the review process.

Contractor qualification statements are generally reviewed by a panel consisting of five members. The purpose in using our own form is to obtain objective data in a consistent format that can be easily processed by our panel members. Unfortunately, it has been our experience that many contractors attempt to use the AIA A305 as a way to direct us to a variety of attachments that are in a unique format which are inconsistent or non-responsive to the type of information we are seeking. So, for example when the form requests the value of the contractor's current work (part 3), a somewhat typical response is "see attachment 6" which is a list of projects that may or may not be tabulated. Actually, what we are looking for in that particular space is a dollar amount, not a list. The numbers are certainly not the full story regarding contractor qualifications, but when we ask for a number, our panel members would like to see a current and accurate number in that space.

Where we do ask for project lists, we have found that some lists are more helpful than others. Although we do not require contractors to provide information in a specific format, we do expect the lists to respond to our request for certain basic information. The preferred format and content for our purposes is as follows:

1. A short, descriptive project title, e.g. "new" student center, or "addition to" or "repairs to library building", etc.
2. Owner and location of the work.
3. The name of the architect/engineer.
4. The construction contract value.
5. The year when the project was completed.

The following should be taken into consideration when compiling the project lists:

a) Since we are a college, we are particularly interested in academic institutional project experience. Highlighting those types of projects is beneficial.
b) If your project involvement was other than as the sole general contractor or construction manager, please make that clear. Thus, if you are one of multiple primes, or a member of a joint venture, or a subcontractor on the project, please make that distinction in the project title and contract value. Do not claim credit for the entire work.
c) The project lists serve as client references for our purposes. References are more highly valued when the client is a college, university or other public entity. Local references and recent references are the most relevant.
d) Project experience becomes increasingly less relevant as the projects become remote in time or distance. We would prefer a short, current and relevant project list.
e) Failure to provide the requested financials is frequently a cause for disqualification.
f) We encourage all companies to provide full and accurate information which best presents their qualifications, but please be concise. Too much data or poorly organized data can impede our review and will ultimately be counterproductive.

Finally, the presentation of material including tabs, indexes, and logical organization makes a difference to panel members who are struggling with a large volume of paper. So prepare the submittal accordingly.

Office of Facilities
Montgomery College

Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading. Information provided in this statement is for the express purpose of assisting Montgomery College in its assessment of the Offeror's suitability for providing services as a General Contractor for the referenced project.

SUBMITTED TO: Office of Procurement
MONTGOMERY COLLEGE

ADDRESS: 9221 Corporate Boulevard
Rockville, Maryland 20850

SUBMITTED BY:
TITLE:

COMPANY NAME:
ADDRESS:

NAME OF PROJECT: **East Garage Fire Alarm Upgrade (Phase 3)**
Takoma Park/Silver Spring Campus

Type of Work (select one):
[ ] General Construction
[ ] HVAC
[ ] Electrical
[ ] Plumbing
[ ] Other (please specify)

1.0 ORGANIZATION

1.1 How many years has your organization been in business as a Contractor?

1.2 How many years has your organization been in business under its present business name?

1.2.1 Under what other or former names has your organization operated?

1.3 Describe the form of your organization (i.e. corporation, partnership, individual, or other) and name the principal(s):

2.0 BUSINESS REGISTRATION & LICENSING

2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business:

2.2 Provide a copy of your business registration and applicable license(s) as an attachment to this form.

3.0 EXPERIENCE

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

3.2 On a separate sheet, list the similar construction projects your organization has completed in the last three years, giving the name of the project, owner, architect, the contract amount, date of completion and percentage of cost of the work performed with your own forces.

3.3 State average annual amount of construction work performed in the last three years:

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

[ ] NO [ ] YES *(attach details)*

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

[ ] NO [ ] YES *(attach details)*

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

[ ] NO [ ] YES *(attach details)*

3.7 Has your organization ever been debarred from bidding on State Contracts by the Board of Public Works, or on any other Local, Municipal, County, State or Federal project?

[ ] NO [ ] YES *(attach details)*

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

[ ] NO [ ] YES *(attach details)*

3.9 Has your organization ever filed for bankruptcy, receivership or any other similar legal protection to protect it from default? (If the answer is yes, please attach details.)

[ ] NO [ ] YES *(attach details)*

3.10 Include a brief description of **three (3) projects** in Section 3.2 listing each project's size, relevant features, construction cost (including general conditions, OH&P), change order value (excluding or annotating Owner directed scope changes), anticipated schedule, actual schedule and an Owner's reference contact person's name and current telephone number. Only

4.0 FINANCIAL STATUS

4.1 Financial Statement

Attach copies of financial statements for the **last two years**, preferably audited, including your organization's balance sheet and income statement showing Current Assets, Net Fixed Assets, Other Assets, Current Liabilities and Other Liabilities. Include name and address of firm preparing attached financial statement(s), and date(s) thereof.

5.0 SIGNATURE

5.1 Dated this ____ day of _____, 2026.

Name of Organization:

_____

By:

Title:

6.0 NOTARY

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

Subscribed and sworn before me this _____ day of _____, 2026.

_____

Notary Public:

My Commission Expires:

SUBCONTRACTOR INFORMATION FORM

Trade: _____

Name: _____

Address: _____

_____

Telephone: _____

Contact: _____

Average Annual Work performed, in dollars, in the last three years: _____

List three representative projects of comparable size, scope and complexity, completed within the last five years. For each project, indicate client name, project location, completion date, size, cost and major features:

Project # 1 _____

_____

_____

_____

_____

Project # 2 _____

_____

_____

_____

_____

Project # 3 _____

_____

_____

_____

_____

MINORITY PARTICIPATION FORM

CONTRACTORS SHALL COMPLETE THE FOLLOWING:

I HEREBY REPRESENT THAT OUR/MY FIRM IS _____

IS NOT _____

IF YES, SELECT MINORITY CLASSIFICATION FROM THE LIST BELOW (check one):

_____ African American _____ Hispanic _____ Native American

_____ Alaskan American _____ Asian _____ Pacific Islander

_____ Woman _____ Disabled _____ Veteran

_____ LGBTQIA+ _____Other: _____

INDICATE EXPECTED MINORITY PARTICIPATION FROM SELF-PERFORMED WORK, AND/OR WORK PERFORMED BY SUBCONTRACTORS AND/OR VENDORS AS A PERCENTAGE OF TOTAL CONTRACT PRICE:

Minority Participation Expectation: _____ % of Base Price Total

I hereby certify that the above information is true and correct, to the best of my knowledge and belief.

_____
Firm Name

_____
Signed Date

_____
Type or Print Name

_____
Title

PROCUREMENT OFFICE QUESTIONNAIRE

RFP Number: 626-004

RFP Title: East Garage Fire Alarm Upgrade (Phase 3)
Takoma Park/Silver Spring Campus

Please be advised that our company **does not** wish to submit a proposal in response to the above-captioned Request for Proposal for the following reasons:

- ☐ Too Busy at this time
- ☐ Not engaged in this type of work
- ☐ Project too large/ small
- ☐ Cannot meet mandatory specifications (Please specify below)
- ☐ Other (Please specify)

_____

_____
SIGNATURE

_____
PRINTED NAME

_____
TITLE

_____
DATE

_____
COMPANY

_____
Address

Please return to:

Montgomery College
Procurement Office
9221 Corporate Boulevard
Rockville, Maryland 20850

CONFLICT OF INTEREST STATEMENT

The undersigned hereby affirms and attests that to the best of its knowledge, no Montgomery College trustee, or employee, or spouse, parent, child, brother, sister of the trustee or employee, own assets in this business, and of this date are NOT employed by Montgomery College.

Company Name:	
Printed Name:	
Title:	
Signature:	
Date:	

NON-DEBARMENT ACKNOWLEDGEMENT

_____ I acknowledge that my firm has NO pending litigation and/or debarment from doing business with the State of Maryland or any of its subordinate government units and/or federal government within the past five (5) years.

_____ I acknowledge that my firm has **pending litigation or has been debarred** from doing business with the State of Maryland or any of its subordinate government units and/or federal government, within the past five (5) years. If so, please provide an attachment describing the pending litigation or debarment **(if you do not have any pending litigation mark "N/A" or "No")**.

_____ I acknowledge none of this company's officers, directors, partners, or its employees have been convicted of bribery, attempted bribery, or conspiracy to bribe under the laws of any state or federal government; and that no member of the Montgomery College Board of Trustees or any employees of the College has any interest in the bidding company except as follows:

_____

_____

_____

As the duly authorized representative of the Offeror, I hereby certify that the above information is correct and that I will advise Montgomery College should there be a change in status.

By (Signature) _____

Name and Title _____

Witness Name and Title _____

CONTRACT
BETWEEN
MONTGOMERY COLLEGE
AND
_____

Board of Trustees
Montgomery College
Rockville, Maryland 20850

Project Title: East Garage Fire Alarm Upgrade (Phase 3)
Takoma Park/Silver Spring Campus

Contract No.: _____

Account No.: _____

This **AGREEMENT** made this _____ day of _____ , 2026, by and between the Board of Trustees of **MONTGOMERY COLLEGE**, a public institution of higher education, hereinafter called the "College", and _____, a _____, registered in the State of _____, located at _____, hereinafter called the "Contractor".

WITNESSETH, that the College and the Contractor for the consideration named agree as follows:

1 QUALIFICATIONS OF THE CONTRACTOR

The Contractor hereby assures the College that the Contractor is qualified to perform the services provided for in this Agreement in accordance with all applicable laws, orders, rules and regulations. The Contractor further assures the College that the Contractor is free from any financial interests which may conflict with the proper performance of this Agreement.

2 DEFINITION OF THE PROJECT

The Contractor agrees to provide all of the necessary labor, materials, equipment and insurance to perform all of the Work described in the Contract Documents. The Work to be performed by the Contractor shall include all items accepted by the College as part of the Contractor's bid submittal, base bid and alternate prices.

3 TIME OF COMPLETION

The Work to be performed under this Agreement shall be in accordance with the Preliminary Project Schedule contained in the Contract Documents. It is agreed that time is of the essence and therefore the College will suffer substantial damages if the Work is not completed within the time stated in the Preliminary Project Schedule contained in the Contract Documents.

SAMPLE

4 LIQUIDATED DAMAGES

It is agreed that time is of the essence and therefore the College will suffer substantial damages if the Work is not completed within the time stated in the Preliminary Project Schedule contained in the Contract Documents. If the Contractor fails to achieve Substantial Completion of its Work on or before the date set for Substantial Completion of the Contract and as a result causes the Project to be completed after the date set for Substantial Completion of the Project as set forth in the Preliminary Project Schedule, liquidated damages shall be assessed against the Contractor in the amount of **$ 1,000** per day for each calendar day that the Contractor delays Substantial Completion of the Project. These assessed damages shall not be considered as a penalty but as mutually agreed upon as the ascertained damages suffered by the College because of the delay. Where, under the contract, additional time is allowed for the completion of the work, the new time limits will be the essence of the contract.

5 CONTRACT DOCUMENTS

The Contract Documents are the Agreement, the Request for Bid/Proposal, Instructions for Bidders/Offerors, the General Conditions of the Contract, Supplementary Information and Conditions, Preliminary Project Schedule, Drawings, Specifications, Addenda issued prior to execution of the Contract, Modifications issued after execution of the Contract, the Performance Bond, the Labor and Material Payment Bond, the Contractor's Bid Form and all attachments thereto received from the Contractor. The term "Contract" when used in the Specifications or Drawings shall be considered as synonymous with the term "Contract Documents".

6 CHANGES TO THE CONTRACT

The College may make any alterations, deviations, additions or omissions to the Contract Documents which it deems to be in the best interest of the College without otherwise affecting the obligations of the Contractor or making void this Agreement. Any alterations, deviations, additions or omissions shall be processed as a change order in the Work and shall be prepared in accordance with the procedure set forth for issuing changes in the Work in the Contract Documents.

7 CONTRACT SUM

The College shall pay the Contractor the Contract Sum of _____Dollars ($ _____.00) for the Work performed strictly in accordance with the requirements of this Agreement. All invoices submitted for Work performed under this Agreement shall include the College's project title, contract number and account number. The Contract Sum is a firm lump sum paid in accordance with the General Conditions of this Agreement.

8 PROGRESS PAYMENTS

Payments shall be made to the Contractor on a monthly basis provided that the Contractor submits Applications for Payments which are prepared in accordance with the General Conditions and supported by such data as the College may reasonably require. The College shall have the right to audit the Contractor's records to verify the payment request. Payment shall be made within thirty (30) calendar days after the requisition, properly prepared and authorized by the College representative, is received in the Finance Office.

SAMPLE

9 ACCEPTANCE AND FINAL PAYMENT

9.1 Upon receipt of written notice from the Contractor that the Work is ready for final inspection and acceptance, the College and/or its representatives shall promptly make such final inspection. When the College Representative finds the Work fully acceptable under the Agreement and the Agreement fully performed, the College Representative shall issue a final certificate stating that the Work provided for in this Agreement has been completed and is acceptable under the terms and conditions thereof and that the entire balance found to be due to the Contractor and noted in the final certificate is due and payable. Before issuance of a final certificate, the Contractor shall submit such evidence the College deems necessary to ensure that all payrolls, materials bills and other indebtedness connected with the Work have been paid. Final payment shall be made within (15) fifteen calendar days after the issuance of a final certificate from the College's Representative that the Work has been fully completed and the Agreement fully performed.

9.2 Neither the acceptance by the College or any representative of the College nor any payment for or acceptance of the whole or any part of the Work, nor any extension of time, nor any possession taken by the College, shall operate as a waiver of any portion of the Agreement or of any power reserved to the College or any right to recover damages. The waiver of any breach of the Agreement shall not be held to be a waiver of any other prior or subsequent breach.

10 NOTICES

Any notice to be provided shall be sent by first class mail and shall be addressed as follows or as may be later designated in writing:

a) For the College:

Ms. Carla Pullen
Vice President for Facilities Management, Capital Planning, and Sustainability
Montgomery College
9221 Corporate Boulevard
Rockville, Maryland 20850

b) For the Contractor:

_____
_____
_____
_____
_____

11 INTERPRETATION OF CONTRACT

This Agreement is a contract under seal and shall be construed and interpreted according to the laws of the State of Maryland, without regard to principles of conflicts of law.

SAMPLE

12 COMPLIANCE WITH LAWS

The Contractor agrees to comply, at no additional expense, with all applicable Executive Orders, Federal, State, county, bi-county, regional and local laws, ordinances, rules and regulations in effect as of the date of this Agreement and as they may be amended from time to time, including but not limited to the equal opportunity clause set forth in 41 CFR 60-250.4 as amended. The Contractor shall further agree to comply with any special provisions or requirements, including more stringent provisions, mandated by any entity having jurisdiction.

13 INDEPENDENT CONTRACTOR

The Contractor shall perform the Contract as an independent contractor and shall not be considered as an agent of the College nor shall any employee or agent of the Contractor be considered subagents of the College. Nothing in this Contract shall be construed as constituting a partnership, joint venture, or agency between the College and Contractor. Other than duties of the Construction Manager based on authority granted to the Construction Manager by the College, no acts performed or representations, whether oral or written, made by or with respect to third parties and the Contractor shall be binding on the College.

14 NONDISCRIMINATION

14.1 The Contractor assures the College that, in accordance with applicable law, it does not, and agrees that it will not discriminate in any manner on the basis of sex, race, age, color, creed, national origin, religious belief, pregnancy, handicap, marital status or status as a disabled veteran or veteran of the Vietnam era. The Contractor further agrees to post in conspicuous places notices setting for the provisions of the non-discrimination clause and to take affirmative action in accordance with applicable law to implement these provisions.

14.2 The Contractor further assures the College that, in accordance with the Immigration Reform and Control Act of 1986, it does not and will not discriminate against an individual with respect to hiring, or recruitment or referral for a fee, of the individual for employment or the discharging of the individual from employment because of such individual's national origin or in the case of a citizen or intending citizen, because of such individual's citizenship status.

14.3 The College is committed to providing a work and study environment that is free from discrimination and harassment on the basis of sex, race, age, color, creed, national origin, religious belief, pregnancy, handicap, marital status or status as a disabled veteran or veteran of the Vietnam era. Behavior contrary to this philosophy, which has the purpose or effect of creating an intimidating, hostile, or offensive environment, will not be tolerated by the College, and it is the Contractor's responsibility to ensure that such behavior by its employees, agents and subcontractors does not occur.

14.4 This policy extends to maintaining an environment free from sexual harassment. Therefore, sexual advances or sexual remarks, requests for sexual favors, and other verbal or physical conduct of a sexual nature must not be condoned or permitted by the Contractor. This prohibition extends to such harassment within the employment context as well as harassment of students, staff and visitors of the College. It should be assumed that all sexual behavior by the Contractor's employees, agents and subcontractors on any campus or facility of the College is improper and unwelcome.

SAMPLE

15 COMPLIANCE WITH THE IMMIGRATION REFORM AND CONTROL ACT OF 1986

The Contractor warrants that both the Contractor and/or any subcontractor of the Contractor do not and shall not hire, recruit or refer for a fee, for employment under this Agreement or any subcontract, an alien knowing the alien is an unauthorized alien and hire any individual without complying with the requirements of the Immigration Reform and Control Act of 1986 (hereinafter referred to as "IRCA"), including but not limited to any verification and record keeping requirements. The Contractor agrees to indemnify and save the College, its employees and/or trustees harmless from any loss, costs, damages or other expenses suffered or incurred by the College, its employees and/or trustees by reason of the Contractor's or any subcontractor of the Contractor's noncompliance with "IRCA." The Contractor agrees to defend the College, its employees and/or trustees in any proceeding, action or suit brought against the College, including but not limited to administrative and judicial proceedings, arising out of or alleging noncompliance of the Contractor with "IRCA." The Contractor recognizes that it is the Contractor's responsibility to ensure that all certifications and verifications as required by law are obtained and maintained for the applicable time period.

16 ASSURANCE OF NONCONVICTION OF BRIBERY

The Contractor hereby declares and affirms that, to its best knowledge, none of its officers, directors or partners and none of its employees directly involved in obtaining contracts has been convicted of bribery, attempted bribery or conspiracy to bribe under the laws of any state or the Federal Government.

17 CONFLICT OF INTEREST

No employee of the College or of the State of Maryland, or any department, commission, agency or branch thereof whose duties as such employee include matters relating to or affecting the subject matter of this Agreement shall, until such time as the Contractor receives final payment, become or be an employee of the party or parties hereby contracting with the College, the State of Maryland, or any department, commission, agency or branch thereof.

18 ASSIGNMENT AND SUBCONTRACTING

18.1 Neither the College nor the Contractor shall sell, transfer, assign or otherwise dispose of this Agreement or any portion thereof, or its right, title or interest therein, or its obligations there under, without the written consent of the other. A change in membership of the Contractor’s firm of one or more officers shall not constitute an assignment.

18.2 The Contractor shall not make any contracts for professional services with any other party for furnishing any of the work or services to be performed under this Agreement without the written approval of the College; however, this provision shall not be taken as requiring the approval of the contract of employment between the Contractor and its personnel assigned for the purposes of performing this Agreement.

SAMPLE

19 INSURANCE

19.1 Contractor shall secure, pay the premiums for, and keep in force until the expirations of this Agreement, and any renewal thereof, adequate insurance as provided below, such insurance to specifically include liability assumed by Contractor under this Agreement. The insurance must be evidenced by a certificate of insurance, and if requested by the College, the proposed awardees/ Contractor shall provide a copy of the insurance policies. The Contractor's insurance shall be primary.

a) Workmen's Compensation Insurance and Unemployment Insurance as required by the laws of the State of Maryland.

b) Commercial General Liability Insurance including all extensions:
$2,000,000 each occurrence;
$2,000,000 personal injury;
$2,000,000 products/completed operations;
$2,000,000 general aggregated

c) Property damage liability insurance with a limit of not less than $2,000,000 for each accident.

d) If automotive equipment is used in the operation, automobile bodily injury liability insurance with limits of not less than $1,000,000 for each person and $2,000,000 for each accident, and property damage liability insurance, with a limit of not less than $2,000,000 for each accident. A combined single limit policy is acceptable.

e) Builder's Risk Insurance, providing property damage coverage and theft replacement coverage for goods provided and services rendered during construction. For renovation projects, when custody of the building is turned over to the Contractor, the Builder's Risk policy must additionally include building replacement value.

All policies for liability protection, bodily injury or property damage must specifically name or its face, Montgomery College, the Board of Trustees, and their employees as" Additional Insured" as respects to operations under the agreement and provided, however, with respect to Contractor's liability for bodily injury or property damage, such insurance shall cover and not exclude Contractor's liability for injury to the property of the College, persons or property of employees, students, faculty members, agents, officers, trustees, invitees or guests of the College.

19.2 At the time this Agreement is made, the Contractor shall provide the College with evidence of payment for the above insurance coverage as resulted by this Agreement. Any request for extension of time of this Agreement shall also include evidence of payment for the above insurance coverage as required by an extension of time for this Agreement.

19.3 These coverages and limits are to be considered minimum requirements under this Agreement and shall in no way limit the liability or obligations of the Contractor. The insurance shall provide that policy coverage will not be canceled, altered or materially changed without sixty (60) calendar days' prior notice to the College by registered or certified mail. The insurance shall not be limited to claims made only while the policy is in effect.

19.4 The Contractor shall furnish the College with a certificate of insurance as evidence of the required coverage. The certificates of insurance must name the College as an additional insured.

19.5 In the event that the Contractor's insurance is terminated, the Contractor shall immediately obtain other coverage and any lack of insurance shall be grounds for immediate termination of this Agreement.

19.6 For the purposes of this article, the word "licensed" shall be deemed to mean an insurance carrier either licensed or approved to do business in the State of Maryland.

SAMPLE

20 SAVE HARMLESS

20.1 The Contractor shall be responsible for any property damage, loss, personal injury, death and/or any other damage which may occur by reason of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. The Contractor agrees to indemnify and save harmless the College and its respective employees, volunteers, students, and trustees, as applicable, (the "Indemnitees") from any claims, loss, costs, damages or other expenses suffered or incurred by the Indemnitees, including attorney's fees and costs, by reason of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. The Contractor at its own expense shall defend the Indemnitees in any action or suit brought against any of the Indemnitees arising out of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. Any acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement on the part of any agent, servant, employee or Subcontractor of the Contractor, or any Subcontractor's agent, servant or employee, are deemed to be the Contractor's acts, negligence, willfulness or failure to perform any of the obligations defined by this Agreement.

20.2 In claims against any person or entity indemnified under subsection 21.1 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under subsection 21.1 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers or workmen's compensation acts, disability benefit acts or other employee benefit acts.

20.3 The College may retain such moneys due or to become due the Contractor under this Agreement as it considers necessary until such suits or claims for damages have been settled or otherwise disposed of and satisfactory evidence to that effect has been furnished to the College.

20.4 The provisions of this Article shall survive the termination of this Agreement.

21 DISPUTES

Any dispute concerning a question of fact arising under this Agreement which is not disposed of by agreement shall be decided by the President of the College or his designee. Pending the final decision of the dispute, the Contractor shall proceed diligently with the Agreement performance. Nothing hereunder shall be interpreted to preclude the parties from seeking, after completion of the Agreement, any and all remedies provided by law.

22 TERMINATION FOR THE CONVENIENCE OF THE COLLEGE

The performance of the work or services under this Agreement may be terminated by the College, in whole or in part, whenever the President of the College shall deem that termination is in the best interest of the College. In such event, the College shall be liable only for payment in accordance with the payment provisions of this Agreement for work or services performed of furnished prior to the effective date of termination, plus reasonable costs of termination, if any, which costs shall be specifically approved by the College in writing. The Contractor shall not be reimbursed for anticipatory profits. Termination hereunder shall become effective by delivering to the Contractor a written notice of termination upon which date the termination shall become effective.

SAMPLE

23 TERMINATION FOR DEFAULT

The performance of the work or services under this Agreement may be terminated by the College, in whole or in part, from time to time, effective upon receipt of notice, whenever the Contractor shall default in the performance of this Agreement and fails to make progress in the prosecution of the contract work or endangers such performance and shall fail to cure such default within ten (10) calendar days period after receipt of written notification from the College specifying the default. Should the Agreement be terminated by the College for failure to perform on the part of the Contractor, no additional compensation shall be paid.

24 DELAY

24.1 In the event the performance of work or services under this Agreement is delayed by causes beyond the control of and without the fault or negligence of the Contractor, the College shall have the option to:

a.) Terminate the Agreement, or

b.) Allow the President of the College or his designee to extend the time for performance. No monetary compensation will be awarded for the time extension.

24.2 Any changes made in this Agreement as a result of delay shall be in writing. In the event the time for performance of this Agreement is extended beyond the term provided for, all other terms and conditions shall remain in full force and effect.

25 WORK UNDER CONTRACT

Work may not commence under this Contract until all conditions for commencement are met, including execution of the Contract by both parties, compliance with insurance requirements and issuance of any required notice to proceed.

26 CONTINGENT FEES

The Contractor hereby declares and affirms that neither it nor any of its representatives has employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the Contractor, to solicit or secure this Agreement, and that it has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or any other consideration contingent on the making of this Agreement.

27 CAPTIONS

The captions and headings contained herein are solely for convenience and reference and do not constitute a part of this Agreement.

28 ENTIRE AGREEMENT

This Agreement and the other items identified as Contract Documents constitute the entire agreement between the parties except that any change orders issued by the College shall automatically be deemed to be part of this Agreement. Any other changes or additions hereto shall not become binding upon any parties until reduced to writing and signed by both parties.

SAMPLE

29 AUDIT

The Contractor shall permit audit and fiscal and programmatic monitoring of the Work performed under this Agreement. The College shall have access to and the right to examine and/or audit any records, books, documents and papers of Contractor and any Subcontractor involving transactions related to this Agreement during the term of this Agreement and for a period of three (3) years after final payment under this Agreement, whether or not disputes (including litigation) exist between the parties.

30 REGISTRATION FOR CORPORATIONS NOT INCORPORATED IN THE STATE OF MARYLAND

Pursuant to 7-201 et seq. of the Corporation and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State of Maryland shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201, before doing any interstate or foreign business in this State. By signing this agreement, the Contractor certifies that it has qualified with the Department of Assessments and Taxation.

31 SEVERABILITY

If any provision of this Agreement shall be held illegal, unenforceable, or in conflict with any law governing this Agreement, the validity of the remaining portions shall not be affected thereby.

IN WITNESS WHERETO, the Contractor and the College have hereunto set their hands and seals the day and year first above written.

Montgomery College

_____
Witness

By: _____
Dr. Jermaine F. Williams
President

Date: _____

Contractor

_____
Witness

By: _____

Date: _____

Fed Tax I.D. No.: _____

SAMPLE

This contract is executed by the Montgomery College Board of Trustees pursuant to Board Resolution No. _____, dated _____.

Certify that this Contract has been prepared in accordance with College Policy and Procedures and certify as Account Manager for this account.

Certify that funds are available for this Contract.

Contract No.
Account No
Amount:

_____
Sherwin A. Collette
Sr. Vice President for Administrative and Fiscal Services

_____
Date

End of Form of Contract

SAMPLE

Montgomery College
Standard Performance Bond

Any singular reference to Contract, Surety, Owner or Other Party shall be considered plural where applicable.

CONTRACTOR (*Name and Address)*:

SURETY *(Name and Principle Place of Business)*:

OWNER *(Name and Address)*:

CONSTRUCTION CONTRACT
Date:
Amount:
Description (Name and Location):

BOND
Date (Not earlier than Construction Contract Dated):
Amount:
Modifications to this Bond: □ None □ See Page 3

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:_____		Signature:_____	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page)

(FOR INFORMATION ONLY – Name, Address and Telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party)

1 The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, and administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2 If the Contractor performs the Construction Contract in accordance with its terms, the Surety and the Contractor shall have no obligation under this Bond.

3 Whenever the Contractor shall be declared by the Owner to be in default under the Contract, the Surety shall, at its sole expense, within 15 days after Owner having mailed to Surety a copy of the notice of default sent to Contractor, take one of the following actions:

3.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

3.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

.2 Deny liability in whole or in part and notify the Owner citing reasons therefor.

4 If the Surety does not proceed as provided in Paragraph 3, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 3.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

5 After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 3.2 or 3.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract. The Surety is obligated without duplication for:

5.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

5.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 3;

5.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor, and

5.4 All other costs and damages permitted to be recovered by the Owner under the Construction Contractor at law.

6 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

7 Any proceeding, legal or equitable, under this Bond may be instituted only in the Circuit Court for Montgomery County, Maryland and the Surety waives venue in any other court.

8 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

9 This Bond had been furnished to comply with a statutory or other legal requirement of the State of Maryland. Any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

10 DEFINITIONS

10.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

10.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

10.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL
Company: (Corporate Seal)

Signature:_____
Name and Title:
Address:

SURETY
Company: (Corporate Seal)

Signature:_____
Name and Title:
Address:

PAYMENT BOND

East Garage Fire Alarm Upgrade (Phase 3)
Takoma Park/Silver Spring Campus

RFP No.: 626-004

Use AIA Document A312-2010, Payment Bond

APPLICATION AND CERTIFICATE FOR PAYMENT

Use AIA Document G702 and G703, Application and Certificate for Payment, latest edition, and relevant attachments, unless otherwise indicated.

MONTGOMERY COLLEGE
GENERAL CONDITIONS OF THE CONTRACT

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ARTICLE 1 – GENERAL PROVISIONS

1.1. DEFINITIONS

1.1.1. The "Agreement" is the written contract between the College and the Contractor.

1.1.2. The "College" is Montgomery Community College or Montgomery College Foundation, Inc.

1.1.3. The "Contractor" is the person or organization having a direct contractual relationship with the College for the execution of the Work under the Contract Documents.

1.1.4. The “Contract Documents” are the Agreement, the Request for Bid or Request for Proposal, Instructions to Bidders/Offerors, Supplementary Instructions, the General Conditions, Supplementary Conditions, Preliminary Project Schedule, Drawings, Specifications, Addenda issued prior to execution of the Contract, Modifications issued after execution of the Contract, the Performance Bond, the Labor and Material Payment Bond, accepted Contractor's Bid or Proposal Form(s) and all attachments thereto received from the Contractor. The term "Contract" when used in the Specifications or Drawings shall be considered as synonymous with the term "Contract Documents".

1.1.5. The "Specifications" are the portion of the Contract Documents included in the Project Manual consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

1.1.6. The "Drawings" are those enumerated in the Specifications and those incorporated in the Contract Documents as the Work progresses.

1.1.7. The "Project Manual" is the volume that includes the Specifications as well as Bidding or Proposal Requirements, Contract Form, General Conditions and Supplementary Conditions.

1.1.8. The term "Work" means all of the obligations undertaken by the Contractor pursuant to the Contract Documents. Work includes, unless specifically excepted, the furnishing of all material, labor, equipment, supplies, plant, tools, scaffolding, transportation, supervision, insurance, taxes and all other services, facilities and expenses necessary for the full performance and completion of the requirements of the Contract Documents. "Work" also means that which is produced, constructed, or built pursuant to the Contract Documents.

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

1.1.10. The term "Subcontractor" means any individual, partnership, firm, corporation or business entity other than an employee of the Contractor, who has a contract with the Contractor to furnish labor, or labor and materials for the Work. The term also includes Subcontractors of a Subcontractor. The term does not include vendors who furnish materials not worked to a special design according to the Drawings and Specifications.

1.1.11. The term "Site" or "Premises" means the area or areas indicated and such additional areas or locations upon which or in which Work under this Contract is being performed together with such areas adjacent thereto, as may be designated for the Contractor's use for a specified, limited period of time by the College.

1.1.12. The "Architect/Engineer" is the person commissioned by the College to design the Work and/or provide construction-phase architectural or engineering services. If the design was performed by the College, "Architect/Engineer" shall refer to the College.

1.1.13. The term "Contract Time" or "Time" and "Completion Date" is the number of calendar days (including weekends and holidays) shown in the Contract Documents as the time allowed for completion of the Work. If a calendar date of completion is shown in the Contract Documents in lieu of the number of calendar days, the Work shall be completed on or before that date.

1.1.14. The term "Contract Sum" refers to the total sum, including authorized adjustments, allotted in the Contract Documents for the services performed by the Contractor for satisfactory completion of all of the Work required by the Contract Documents.

1.1.15. “Shop Drawings" are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

1.1.16. “Product Data" are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor or a Subcontractor, manufacturer, supplier or distributor to illustrate materials or equipment for some portion of the Work.

1.1.17. “Samples" are natural materials, fabricated items, equipment, devices, appliances or parts thereof as called for in the Specifications, and any other samples as may be required by the College to determine whether the kind, quality, construction, workmanship, finish, color and other characteristics of the materials, etc., proposed by the Contractor conform to the requirements of the Contract Documents. Samples shall establish the kind, quality and other required characteristics of the various parts of the Work, and all Work shall be in accordance with the accepted samples.

1.1.18. The term "Request for Information" refers to a written instrument submitted by the Contractor requesting that a clarification with respect to the Contract Documents be provided by the Architect/Engineer.

1.1.19. The term "Change Order" refers to a written instrument signed by the College which describes a directive by the College which is a change in the Work.

1.1.20. The "College's Representative" is the Vice President of Facilities & Public Safety or their designee.

1.1.21 The “College’s Project Manager” is(are) the person(s) or entity(ies) employed or retained by the College to provide project and construction management services, including administration of the Contract as described in Article 2. The College may exercise any power or authority of the College’s Project Manager under the Contract.

1.1.22. "Day" means a calendar day unless otherwise designated.

1.1.23. "Notice to Proceed" means a written notice to the Contractor of the date on which it shall begin the prosecution of the Work. The Contract Time shall begin to run from the starting date established in the Notice to Proceed. Notice to Proceed will be timely provided upon receipt of Contractor materials required before the start of work, including but not limited to performance, payment, labor and material bonds and insurance certificates.

1.1.24. "Written Notice" means giving of notice under the Contract by one party to the other. Unless otherwise indicated in the Contract Documents, Written Notice shall be deemed to have been duly served on the Contractor if delivered in person to the individual or to the member of the firm or to an office of the corporation to whom it is directed, or if delivered by regular or certified mail to the last business address known to the College. Written Notice shall be deemed to have been given to the College upon actual receipt of Written Notice by the College.

1.2. CONTRACT DOCUMENTS

1.2.1. Correlation and Intent of Contract Documents

1.2.1.1. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Their intent is to include in the scope of the Contract, at no additional cost to the College, all Work necessary for proper completion of the Work ready for continual efficient operation that is reasonably inferable from the Documents.

1.2.1.2. Prior to submitting its price, the Contractor shall obtain from the College, clarification of all questions which may have arisen as to the intent of the Contract Documents, or any conflict between two or more items in the Contract Documents. Should the Contractor fail to obtain clarification, then the College may direct that the Work proceed by any method indicated, specified or required by the Contract Documents, in the judgment of the College. The direction by the College shall not constitute the basis for a claim for extra costs by the Contractor. The Contractor acknowledges that it had the opportunity to request clarification prior to submitting its price to the College and that it is not entitled to claim extra costs as a result of failure to request such clarification.

1.2.1.3. The College's Project Manager shall make recommendations regarding the amount, quality, acceptability and fitness of the several kinds of Work and materials which are to be paid for under this Contract and shall make recommendations regarding all questions which may arise in relation to the Work and the construction thereof. The College's decision, based on the College's Project Manager's recommendation, shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties relative to the Contract Documents, the determination or decision of the College shall be a condition precedent to the right of the Contractor to receive payment for the Work under the Contract related to such questions.

1.2.1.4. In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the more restrictive condition in consideration of following priorities:
(1) The Request for Bid or Request for Proposal
(2) Any modifications to the Contract Documents executed after the date of the Contract, with the Modifications having the latest date having the greatest authority.
(3) The Contract.
(4) Supplementary Conditions.
(5) General Conditions.
(5) Drawings and Specifications.
(6) The Contractor's Proposal accepted by the College.

In the event of a conflict or discrepancy within the Specifications or the Drawings, or between the Drawings and the Specifications, the better quality or greater quantity of Work shall be provided in accordance with the College's interpretation.

1.2.1.5. The College's Project Manager and Architect/Engineer shall make recommendations to the College to clarify the meaning and intent of the Specifications and the Drawings where the same may be found unclear or be in dispute.

1.2.1.6. The Contractor is responsible for coordinating and completing the various parts of the Work. No part of the Work shall be left in an unfinished or incomplete condition because of a disagreement between the Contractor and Subcontractors, or between Subcontractors and the Contractor as to where the Work of one begins and ends in relation to the Work of the other. Any adjustments due to differences or conflicts which may arise between the Work of the Contractor under this Contract and the work of other contractors performing work for the College shall be determined by the College and the College's Project Manager.

1.2.1.7. Generally, the Specifications describe Work which cannot be readily indicated on the Drawings and indicate types, qualities and methods of installation of the various materials and equipment required for the Work. The Specifications are not intended to mention every item of Work which can be adequately shown on the Drawings. The Drawings are not intended to show all items of Work described or required by the Specifications even if they are of such nature that they could

have been shown thereon. All materials or labor for Work which are shown on the Drawings, or are reasonably inferable there from as being necessary to produce a finished Work, shall be provided by the Contractor whether or not the Work is also expressly covered in the Specifications.

1.2.2. Specification Format

1.2.2.1. The Specifications are separated into titled sections for convenience only and not to identify the trade or craft responsible to perform the Work. The titled section shall not operate to make the College an arbitrator for the division of responsibility between Contractor and its Subcontractors, and between its Subcontractors, nor shall such sections relieve the Contractor from the responsibility for the satisfactory completion of the entire Work regardless of the division.

1.2.2.2. The General Conditions are a part of each and every section of the Specifications.

1.2.2.3. The Specifications may be abbreviated and include incomplete sentences. Omissions of words or phrases such as "the Contractor shall", "shall be", etc., are intentional; nevertheless, the requirements of the Specifications are mandatory. Omitted words or phrases shall be supplied by inference in the same manner, as they are when a "note" occurs on the Drawings.

1.2.2.4. Words in the singular shall include the plural whenever applicable, or the context so indicates.

1.2.2.5. Where "as shown", "as indicated", "as detailed" or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where "as directed", "as required", "as permitted", "as authorized", "as approved", as accepted", "as selected", or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance or selection by the College is intended unless otherwise stated. As used herein, "provide" means "provided complete in place", that is, furnished and installed and ready for operation and/or use.

1.2.3. Standard Specifications

1.2.3.1. Any reference to standard specifications of any society, institute, association or governmental authority is a reference to the standard specifications of such organization and to their methods of installation of the various materials and equipment required for the Work which are in effect at the time prices are due. It is not intended to mention every item of work described or required by the standard specifications even if they are of such nature that they could have been shown thereon. All materials or labor for work which are inferable there from, as the Contractor shall provide being necessary to produce a finished job at the date of the Contractor's price. If such specifications are revised prior to completion of any part of the work to which such revision would pertain, the Contractor may, if acceptable to the College, perform such work in accordance with the revised specifications.

1.2.3.2. The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications.

1.2.4. Ownership

1.2.4.1. The Drawings, Specifications and other documents prepared by the Architect/Engineer, are owned by the College. Copies thereof furnished to the Contractor, are for use solely with respect to this Project.

ARTICLE 2 – COLLEGE AND COLLEGE'S AGENTS

2.1. AUTHORITY OF COLLEGE'S PROJECT MANAGER

2.1.1. The College's Project Manager has the authority to perform all of the College's functions pertaining to the conduct and administration of the Work, except as indicated in 2.1.2.

2.1.2. Unless otherwise indicated in the Contract Documents, the College's Project Manager is NOT authorized to make determinations (as opposed to recommendations) that:

2.1.2.1. Alter or modify the Contract Documents;

2.1.2.2. Alter the Contract schedule;

2.1.2.3. Approve Contract change orders;

2.1.2.4. Terminate or cancel the Contracts.

2.1.3. Unless otherwise indicated in the Contract Documents, recommendations made by the College's Project Manager, pertaining to determinations listed in 2.1.2, are changes in the work that require review, approval and further authorizing action from the College as indicated in Article 6.

2.2. RESPONSIBILITIES OF THE COLLEGE'S PROJECT MANAGER

2.2.1. The College's Project Manager shall be an agent of the College to the extent set forth in the Contract Documents. Any non-College employee in such role shall not be deemed to be the employee of the College for any purpose in connection therewith. Subject to subsection 2.1.2, the College's Project Manager shall have full authority to act, or to cause others to act, on behalf of the College to assure that the Work is carried out in full compliance with the requirements of the Contract, and to otherwise generally protect the College's interests.

2.2.2. The College's Project Manager will determine in general that the Work of the Contractor is being performed in accordance with the Contract Documents, and will use his best efforts to guard the College against defects and deficiencies in the Work of the Contractor.

2.2.3. The College's Project Manager shall provide administrative management and related services as required to coordinate the Work of the Contractor and separate contractors with each other and with the activities of the Architect/Engineer to complete the Project in accordance with the College's objectives for cost, time and quality.

2.3. RESPONSIBILITIES OF THE COLLEGE DEPARTMENT OF ENVIRONMENTAL SAFETY

2.3.1. The Montgomery College Office of Facilities and Public Safety Department of Environmental Safety is responsible for promoting a safe and healthful work environment for the Project and for verifying the Contractor's compliance with Federal and State environmental protection regulations and College safety and health practices. To carry out these responsibilities, the Department of Environmental Safety is authorized to inspect the Project, all work done and being done, and all material to be furnished and being furnished. In the event that the Department learns of an unsafe condition, the Environmental Safety Manager is authorized to suspend work (after notice to the College Project Manager and the Office of Facilities Management) until the unsafe condition is cured by the Contractor. "Unsafe condition" means any practice that represents a significant risk of injury or health hazard to College employees, a significant adverse environmental impact, or a physical hazard which could result in damage to College property and/or the public. The authority of Department of Environmental Safety is in addition to any other rights of the College set forth herein.

2.4. RESPONSIBILITIES OF THE ARCHITECT/ENGINEER

2.4.1. Architect/Engineer's Status

2.4.1.1. The College may maintain staff personnel from the Office of Facilities and Public Safety, or as separate architectural and/or engineering services retained by the College, at the site of the Work for field observation and day-to-day monitoring of the Work.

2.4.1.2. The Architect/Engineer shall assist the College during the construction period and with the College's Project Manager shall observe the Work in process on behalf of the College. The Architect/Engineer will not be responsible for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work. The Architect/Engineer shall have authority to act on behalf of the College only to the extent expressly provided in the Contract Documents or otherwise in writing.

2.4.1.3. With the College's Project Manager the Architect/Engineer may advise the College with respect to claims of the College or the Contractor, on matters relating to the execution and progress of the Work and on the interpretation of the Contract Documents.

2.4.1.4. Together with the College's Project Manager the Architect/Engineer shall certify applications for progress payments and final payment that the Contractor has complied with the requirements of the Contract Documents.

2.4.1.5. Together with the College's Project Manager the Architect/Engineer shall determine Contractor's achievement of Substantial Completion and Final Completion milestones, and issue relevant certificates, in accordance with the requirements of the Contract Documents.

2.5. COLLEGE'S RIGHT TO STOP OR SUSPEND WORK

2.5.1. Stopping of the Work

2.5.1.1. Subject to concurrence by the College, the College's Project Manager may stop all or part of the Contractor's Work, if in the opinion of the College's Project Manager the Contractor has performed Work not in conformance with the Contract Documents. The Work may be stopped until such time that the defective conditions have been corrected. All costs related to the stoppage of the Work shall be borne by the Contractor.

2.5.2. Suspension of the Work

2.5.2.1. The College unilaterally may order the Contractor in writing to suspend, delay or interrupt all or any part of the Work for a period of time as it may determine to be appropriate.

2.5.2.2. If the performance of all or any part of the Work is for an unreasonable period of time suspended, delayed or interrupted by an act or omission of the College in the administration of the Contract, an adjustment shall be made for any increase in the cost of performance of the Contract (excluding profit) necessarily caused by an unreasonable suspension, delay or interruption and the Contract modified in writing accordingly. No adjustment shall be made under this subsection for any suspension, delay or interruption to the extent (1) that performance would have been so suspended, delayed or interrupted by any other cause, including the fault or negligence of the Contractor; or (2) for which an equitable adjustment is provided for or excluded under any other provision in this Contract.

ARTICLE 3 – CONTRACTOR

3.1. RESPONSIBILITIES OF THE CONTRACTOR

3.1.1. The Contractor shall furnish all labor, materials, equipment, tools, construction equipment, machinery, plant, supplies, utilities, telephone, transportation, supervision, temporary construction, permits, insurance, taxes, bonds, contributions and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work, as described in the Contract Documents.

3.1.2. Montgomery County or City of Rockville Complex Structures processes may apply to the Project. When applicable, Contractor shall fulfill any necessary obligations related to that process.

3.2. CONTRACTOR'S ADMINISTRATION AND SUPERVISION OF THE WORK

3.2.1. Staff

3.2.1.1. The Contractor shall furnish a competent, qualified and adequate staff as necessary to administer coordinate, supervise and superintend the Work; to organize the procurement of all materials and equipment so that they will be available at the time they are needed for the Work; and to keep an adequate force of skilled workers on the job to complete the Work in accordance with all requirements of the Contract Documents and to the entire satisfaction of the College's Project Manager. Key members of the staff shall not be changed without the consent of the College's Project Manager.

3.2.1.2. Prior to commencement of the Work, the Contractor shall select a project representative who will have full responsibility for the prosecution of the Work, with full authority to act in all matters as necessary for the proper coordination, direction and technical administration of the Work and who shall attend meetings at such place or places as determined by the College's Project Manager in order to render reports on the progress of the Work.

3.2.2. Supervision

3.2.2.1. The Contractor shall efficiently supervise the Work, using its best skill and attention. It shall carefully study and compare all drawings, specifications and other instructions and shall at once report to the College's Project Manager any error or omission which it may discover, and shall subsequently proceed with the Work in accordance with instructions from the College's Project Manager concerning such error or omission.

3.2.2.2. The Contractor shall assign to the Project throughout its duration a well-qualified, competent superintendent and any necessary assistants, all of whom must be satisfactory to the College's Project Manager. The superintendent shall represent the Contractor in its absence and all directions given to him shall be as binding as if given to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case.

3.2.2.3. The College's Project Manager shall not supervise the Work. The means, methods, techniques, sequences, procedures and safety measures utilized in the performance of the Work are the sole responsibility of the Contractor, subject to overall coordination of the College's Project Manager. Any means, method, techniques, sequences or procedures set forth in the Contract Documents are solely to specify the desired end product; and if the means, methods, techniques, sequences or procedures will not result in the desired end product or is unsafe or illegal because of some inherent defect in the Specifications or the particular conditions under which the Work is being performed, it is the Contractor's responsibility to select a correct means, method, technique, sequence or procedure. Nothing in the College's Project Manager's review of the general quality and progress of the Work, including acceptance of submittals and Work, shall be construed as the assumption of authority or supervision over the performance of the Work, or relieves the Contractor from its obligation to comply with the requirements of the Contract Documents.

3.2.3 Subcontracts

3.2.3.1. The Contractor shall, prior to the execution of the Contract, notify the College in writing of the names of Subcontractors, if any, proposed for the principal parts of the Work and for such other parts of the Work as the College's Project Manager may direct. The Contractor shall not employ any Subcontractor that the College may, within a reasonable time, object to for any reason.

3.2.3.2. The Contractor is as fully responsible to the College for the performance, management, acts and omissions of its Subcontractors and of persons either directly or indirectly employed by them, as it is for the performance, management, acts and omissions of persons directly employed by it.

3.2.3.3. Nothing contained in the Contract Documents shall create any contractual obligation between any Subcontractor and the College.

3.2.3.4. The Contractor agrees to bind every Subcontractor, and every Subcontractor agrees to be bound by the terms of the Contract, the Drawings and the Specifications as far as applicable to its Work, including the following provisions, unless specifically noted to the contrary in a subcontract approved in writing as adequate by the College.

3.2.3.5. The Subcontractor agrees:

(1) To be bound to the Contractor by the terms of the Contract, the Drawings and the Specifications, and to assume toward the Contractor all the obligations and responsibilities that it, by those documents, assumes toward the College.
(2) To submit to the Contractor applications for payment in such reasonable time as to enable the Contractor to apply for payment.

3.2.3.6. The Contractor agrees to place in its subcontracts with Subcontractors:

(1) To be bound to the Subcontractor by all the obligations that the College assumes to the Contractor under the Contract, the Drawings and the Specifications, and by all the provisions thereof affording remedies and redress to the Contractor from the College.
(2) To pay the Subcontractor, upon the payment of certificates, if listed in the Schedule of Values the amount allowed to the Contractor on account of the Subcontractor's Work to the extent of the Subcontractor's interest therein.
(3) To make no demand for liquidated damages for delay in any sum in excess of such amount as may be specifically named in the subcontract.
(4) That no claims for services rendered or materials furnished by the Contractor to the Subcontractor shall be valid unless written notice thereof is given by the Contractor to the Subcontractor during the first ten days of the calendar month following that in which the claim originated.
(5) To give to the Subcontractor an opportunity to be present and to submit evidence in any decision involving its rights.

3.2.4. Behavior of Contractor's Employees, Agents and Subcontractors

3.2.4.1. The College is committed to providing a work and study environment that is free from discrimination and harassment on the basis of race, color, religious creed, ancestry, national origin, age, sex, marital status, handicap, pregnancy or status as a disabled veteran or veteran of the Vietnam Era. Behavior contrary to this philosophy, which has the purpose or effect of creating an intimidating, hostile, or offensive environment, will not be tolerated by the College, and it is the Contractor's responsibility to ensure that such behavior by its employees, agents and Subcontractors does not occur.

3.2.4.2. This policy extends to maintaining an environment free from sexual harassment. Therefore, sexual advances, sexual remarks, requests for sexual favors, and other verbal or physical conduct

of a sexual nature must not be condoned or permitted by the Contractor. This prohibition extends to such harassment within the employment context as well as harassment of students, staff and visitors of the College. It should be assumed that all sexual behaviors by the Contractor's employees, agents or subcontractors on any campus or facility of the College, whether owned, operated, maintained or leased by the College, is improper and unwelcome.

3.2.4.3. Montgomery College is a tobacco free institution. Use of tobacco products is prohibited in all indoor and outdoor College-owned facilities and facilities leased and controlled by the College as well as at meetings or conferences sponsored by the College. This use prohibition extends to Contractors' employees, agents, subcontractors and vendors.

3.3. MATERIALS, LABOR, EQUIPMENT AND PROCESSES

3.3.1. Proposals

3.3.1.1. Proposals shall be based upon the materials, equipment or processes specifically named, implied in or reasonably inferable from the Contract Documents.

3.3.1.2. In cases where Work is to be performed in an existing building, proposals shall be based on Contractor's review of existing conditions by means including but not limited to: site inspection and review of existing College documentation, if any, including data from the Environmental Safety Office. Failure or omission of the Contractor to inspect the site and examine available documents shall in no way relieve the Contractor from obligations with respect to its price, nor constitute grounds for a subsequent claim.

3.3.1.3. Certain Project proposals shall be based on Prevailing Wage Rate schedule provided by and the reporting requirements of the State of Maryland's Department of Labor, Licensing and Regulation (DLLR). If guidance regarding applicability of Prevailing Wage Rates is not otherwise included in the Contract Documents, Contractor shall request a determination of applicability from the College prior to submitting a proposal.

3.3.2. Labor, Materials and Equipment

3.3.2.1. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract.

3.3.2.2. The Contractor shall furnish sufficient forces to ensure the prosecution of the Work within the time stated in the Contract.

3.3.2.3. The Contractor shall comply with the provisions of Sections 17208 entitled Prevailing Wage Rates, when applicable, and 17301 through and including 17306 of the State Finance and Procurement Article of the Annotated Code of Maryland (as amended from time to time) entitled "Steel Procurement for Public Works."

3.3.2.4. Unless otherwise specified, all materials and equipment to be permanently installed in the Work shall be new and shall be of such quality as required to satisfy the standards of the Contract Documents. The Contractor shall, if required, furnish satisfactory evidence as to kind and quality of all materials and equipment.

3.3.2.5. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. All labor shall be performed by workers skilled in their respective trades, and Work produced shall be of good quality so that first class Work in accordance with the standards of construction set forth in the Contract Documents will result.

3.3.3. Use of Named Materials

3.3.3.1. Where materials are specified by a name, or several names are specified, without the words 'or equal' following such name(s) the Contractor shall use and/or supply the named material that meets all the requirements of the Specifications.

3.3.4. Use of Equivalent Materials

3.3.4.1. Where the words ‘or equal’ are included, at the Contractor's sole risk, the Contractor may submit a material it considers to be equal in quality, capacity, size, or other determining criteria. The burden of submitting adequate information to the College to prove equality of materials shall be the responsibility of the Contractor. A direct comparison of features and fit with the specified item must be included. Whether an equal or specified product is proposed, all of the units of a given type required for and used in the Work must be the same in material and manufacture. The decision of the College with regard to quality of materials shall be final. The College may reject a proposed equal without cause and the Contractor shall not be entitled to additional compensation.

3.3.5. Substitutions

3.3.5.1. Substitutions requests will be considered only under the following circumstances:

(1) When the specified product is not available; or
(2) When, if a certain product or process is specified and a guarantee of performance is required and, in the judgment of the Contractor, the specified product or process will not produce the desired results; or
(3) When a substitution, in the opinion of the College is in its best interest.

3.3.5.2. Requests for substitutions of products, materials or processes other than those specified shall be submitted in writing to the College’s Project Manager and be accompanied by evidence that the proposed substitution: (1) is equal in quality and service-ability to the specified item; (2) will not entail changes in details and construction of related work; and (3) will be acceptable in consideration of the required design and artistic effect. The Contractor will furnish with its request such drawings, specifications, samples, performance data and other information as may be required of it to assist the College in determining whether the proposed substitution is acceptable. A direct comparison of features and fit with the specified item must be included. The substitution request shall state the credit or extra, if any, involved with the use of such material. The burden of proof shall be upon the Contractor.

3.3.5.3. Regardless of the evidence submitted or any review or independent investigation by the College, a request for a substitution of products, materials or processes is a warranty by the Contractor to the College that (1) the requested substitution is equal in quality and serviceability to the specific item; (2) will not entail changes in details and construction of related work; (3) will be acceptable in consideration of the required design and artistic effect; (4) will not involve any additional cost to the College other than that specified in an accompanying request for a change order; and (5) the Contractor will provide the same or better warranty for the substitution that the Contractor would for that specified.

3.3.5.4. The College’s acceptance of a substitution does not relieve the Contractor of responsibility for any unforeseen consequences and/or costs associated with the substitution.

3.3.5.5. The College may reject a proposed substitution without cause.

3.3.6. Required List of Materials and Equipment

3.3.6.1. Unless otherwise indicated in the Contract Documents, the Contractor shall submit to the College’s Project Manager a comprehensive list of the manufacturer's products proposed for this

Work as soon as practicable and within thirty (30) calendar days after receipt of notice to proceed. The list shall include information on materials, equipment and fixtures as may be required for the College's Project Manager's preliminary review; partial lists will not be considered. Acceptance of this list of products shall not be construed as a substitute for the shop drawings, manufacturer's descriptive data and samples which are required by the Contract Documents, but rather as a base from which more detailed submittals shall be developed for the College's final review.

3.3.7. Tariffs

The Contractor's Contract Sum shall be presumed to include all tariffs levied on materials, supplies, equipment or other property incorporated into or used on the Project, whether the tariff is imposed before or after the Contract is signed.

3.4. WARRANTY/GUARANTEES

3.4.1. Except to the extent that the Contract Documents impose greater warranty obligations on the Contractor for all or any part of the Work, the Contractor warrants:

3.4.1.1. That the materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents;

3.4.1.2. That the Work contains no faulty or imperfect material or equipment or any imperfect, careless or unskilled workmanship;

3.4.1.3. That all mechanical and electrical equipment, machines, devices, etc., shall be adequate for the use to which they are intended and shall operate with ordinary care and attention in a satisfactory and efficient manner; and

3.4.1.4. That the entire Work shall be watertight and leak proof in every particular.

3.4.1.5. Unless otherwise indicated in the Contract Documents, for a period of one year commencing on the date of Substantial Completion or such other date agreed upon, the Contractor shall schedule, manage and monitor all warranty call-backs requested by the College and re-execute, correct, repair, or remove and replace with proper Work, without cost to the College, any Work found not to be as guaranteed by this section or otherwise not in conformity with the Contract and that it will make good all damages or cost to other Work or materials in the process of complying with this section in accordance with Article 10, Correction of Work. The Contractor shall pay for tests and inspections made necessary by faulty Work. The correction period shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation shall survive Final Completion of the Work under the Contract and the Contract Close Out.

3.4.2. Nothing contained in Subsection 3.4.1.5 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of time period of one year as described in Subsection 3.4.1.5 relates only to the specific obligation of the Contractor to correct the Work and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

3.4.3. The Contractor shall cause to be assigned to the College all warranties/guarantees furnished by manufacturers and suppliers of equipment and supplies for the Work. The assignment shall not affect Contractor's warranty obligations to the College.

3.5. TAXES

3.5.1. The College is not exempt from payment of Maryland State Sales Tax and Municipal Occupation (Sales) and/or Use Taxes on materials purchased for this Work.

3.5.2. The Contractor and Subcontractors shall pay sales, consumer, use, unemployment, old age pension and/or other taxes imposed by local, state and/or the Federal government, except taxes and assessments on the real property comprising the Work site. The Contractor is to include such expenses in its proposal.

3.6. PERMITS AND LICENSES

3.6.1. The College will file for the building permit, if one is necessary, with the local authority. The Contractor shall obtain and pay for any and all permits (other than the building permit), and for all licenses and certificates of inspection necessary for the execution and completion of the Work as called for in the Contract Documents. The Contractor will be required to pay all necessary fees to local authorities for permits and inspections and it shall include the cost of the fees in its base price. The College shall not be responsible for the actions or interpretations of county, municipal or other local agencies or officials with respect to the application of Federal, State or local laws, rules, ordinances, regulations, codes or policies to the Work.

3.6.2. The Contractor must be licensed as required by Title XVII, Subtitle VI or Title VIII of the Business Regulation Article, Annotated Code of Maryland.

3.7. PROSECUTION AND PROGRESS OF THE WORK

3.7.1. Notice to Proceed

3.7.1.1. After the Contract has been executed, the College's Project Manager will issue to the Contractor a "Notice to Proceed" and this notice will stipulate the date on or before which the Contractor is expected to begin Work. The specified Contract time shall begin on the starting date stated in the "Notice to Proceed." Any Work started or materials ordered before the starting date stated in the "Notice to Proceed" shall be at the risk of the Contractor.

3.7.1.2. Notice to Proceed will not be issued until the College receives from the Contractor performance, labor and material payment bonds, insurance certificates and other documents which are required by the Contract. The Contractor is prohibited from performing any Work on the site until proof of the insurance required by the Contract is provided to the College.

3.7.2. Hours of Work

3.7.2.1. The Work shall be performed during regular working hours except in the event of emergency, or when required to complete the Work within the time stated in the Contract. What constitutes regular working hours will be agreed upon at the preconstruction conference.

3.7.2.2. The Work shall be suspended on the College's Commencement Day (typically the third Friday in May) unless otherwise agreed to by the College.

3.7.2.3. The Work may be performed on night shifts, overtime, Sundays and holidays when permission to do so has been obtained from the College, at no additional cost to the College, and provided that Contractor complies with any additional regulations regarding off-hours work mandated by regulatory authorities.

3.7.3. Construction Schedule

3.7.3.1. Time

(1) All time limits in the Contract Documents are of the essence of the Contract.

Contractor and the College agree that the time stated in the Contract for the completion of the Work is a reasonable time, considering the usual climatic range and the usual business conditions prevailing in the locality of the Project. The Contract time shall be the full time allowed or required for completion of every task involved in completion of the Work, including lead-time for ordering and fabrication of equipment and materials.

(2) The College is not obligated (a) to accept an early completion schedule from the Contractor, or (b) to accept the Project prior to the completion date stated in the Contract. The College will not be liable for any claims based on the Contractor's assertion of an intention to finish early.

3.7.3.2. Preliminary Schedule

(1) The Contractor shall agree to comply with the Preliminary Project Schedule prepared by the College and included in the Contract Documents or with the Contractor's Proposed Project Schedule, if one was required as part of the Contractor's proposal submission. Agreement by the Contractor to comply with the Preliminary Project Schedule or Contractor's Proposed Project Schedule also means agreement by the Contractor to comply with subsequent reasonable updates prepared or requested by the College.

(2) Within 14 days of the execution of the Contract, Contractor must submit for approval, Preliminary Schedule information outlining all activities for the Contractor's work as may be reasonably requested by the College's Project Manager. Coordinate schedule information with milestones indicated in the Preliminary Project Schedule. This preliminary information must be approved prior to the first Application for Payment being processed. Include each significant construction activity, coordinate each activity with other activities and schedule each construction activity in proper sequence. The College's Project Manager may decline to issue a Notice to Proceed until Contractor has submitted the required schedule information and it is approved by the College's Project Manager. Nothing in this section shall be construed to require the College's Project Manager to issue a Notice to Proceed when the required schedule information has been submitted and approved.

(3) With submission of the preliminary schedule information, include a listing by date of submission of all submittals required. Identify those required to maintain orderly progress of the Work, and those required early because of long lead time for manufacture or fabrication.

3.7.3.3. Completion Schedule

(1) Within 30 days after Contract execution and at such other times as required by subsections 3.7.3.4 and 3.7.3.8, the Contractor shall submit for approval, updated schedule information indicating the time allocated by the Contractor for the performance of each portion of the Work and the submittal information required by subsection 3.7.3.2 (3), properly and reasonably sequenced for achieving each task shown on the schedule. Coordinate schedule with milestones indicated in the Preliminary Project Schedule.

(2) The Contractor's construction schedule shall begin with the date of issuance of Notice to Proceed and conclude with the required date of final completion of the project as stated in the Contract Documents. Float or slack time available in the schedule at any time shall not be for the exclusive use or benefit of either the Contractor or the College, but is jointly owned.

(3) The Contractor's schedule information shall include a complete itemized breakdown of the Work, listed by activity or event number, including items related to the General Conditions, all necessary dates for submittal, review and response, and re-submittal (if necessary), and for each activity shall show at a minimum: (1) a sequence of operations; (2) the dates of commencement and completion of each item of the

Work; and (3) delivery for material and equipment. Unless otherwise indicated in the Contract Documents or agreed upon by the College's Project Manager the duration of each activity shall be twenty-one calendar days or less.

(4) Contractor shall submit with each Application for Payment revised schedule information accurately updated to reflect all: (1) revisions to the schedule (2) changes made or planned in the construction sequence; (3) actual construction activities to date including (i) commencement and completion dates for activities started or completed during the reporting period; and (ii) current progress of activities started in prior reporting periods including completion dates for activities completed during the reporting period; (4) delays and their effects on the critical path; (5) extensions of time granted by the College and (6) the Contractor's planned schedule or recovery schedule for completing remaining activities. This required schedule information update shall be furnished monthly whether or not Contractor submits an application for payment in that month.

(5) In the event that there are change orders, they shall be reflected as new activities, or as changes in logic and/or time framing of existing activities. They shall be introduced at the next updating after receipt of a change order, and shall be subject to the approval of the College's Project Manager. Change order logic shall affect only those intermediate activities and performance dates directly concerned. Adjustments required in completion dates for those intermediate dates, or for the Contract as a whole, will be considered only to the extent that there is not sufficient remaining float to absorb the additional time which may be authorized for completion of individual activities.

(6) Whenever the Project shall be behind schedule or alleged by either party to be behind schedule, the College may require the Contractor to furnish, at no additional cost to the College revised schedule information (hereinafter called a "recovery schedule") showing how the Contractor will finish their work by the Contract completion date.

(7) All of Contractor's schedule information, including monthly schedule information updates and any recovery schedule information required shall be subject to review and approval by the College's Project Manager.

(8) The Contractor shall cooperate with the College's Project Manager in scheduling and performing the Contractor's Work to avoid conflict, delay in or interference with the Work of other contractors or the construction or operation of College's own forces. The Contractor shall participate with other contractors and the College's Project Manager and College in reviewing schedules when directed to do so. The Contractor shall make any revisions to their construction schedule information deemed necessary after a joint review.

(9) Approval by the College's Project Manager of any schedule information submitted shall constitute approval of the schedule information only for general conformity with Contract requirements and shall not constitute approval, acceptance or admission of the reasonableness, accuracy, achievability, or feasibility of the schedule information or of the Contractor's ability to meet the schedule, or waiver or excuse of default or delay by the Contractor, extension of the time for completion, waiver or modification of Contract requirements, admission of fault or responsibility for delay on the part of the College or acceptance or admission on the part of the College of any liability or responsibility for the schedule or for acceleration or other costs or delay damages of the Contractor which are inferable from the Contractor's schedule information or update.

(10) The College is not obligated to pay the Contractor for Work completed until proper, accurate schedule information, and updates are furnished as required and it is not liable for and Contractor is not entitled to damages, compensation, or time extensions for delays starting, occurring or continuing during the period when an accurate and reasonable schedule information or update was due but not furnished by the Contractor.

3.7.3.4. All schedule information, including initial schedule information, recovery schedule information and monthly updates, shall be submitted in three (3) paper copies and one (1) electronic copy in Portable Document Format (PDF), unless otherwise indicated.

3.7.4. Progress Meetings

3.7.4.1. Contractor shall plan and participate in routine Project progress meetings to brief College's Project Manager and Architect/Engineer on the status of the Project. Frequency of meetings shall be determined at a preconstruction conference, but shall typically occur not less than every two weeks. Primary agenda topics shall include reporting status of: Regulatory Approvals, Submittals, RFIs, Commissioning, Safety, Security and Housekeeping, Schedule, Contracts/Finance and Close-Out. Unless otherwise indicated in the Contract Documents, record meeting minutes will be prepared by the Contractor.

3.7.4.2. Contractor shall provide reasonable advance notice to the College's Project Manager and Architect/Engineer regarding scheduling of pre-construction and pre-installation conferences with subcontractors. At a minimum, Contractor should anticipate College's participation in conferences related to underground work, demolition work, primary structural work, all building enclosure work, MEP and telecommunications, AV and security systems work.

3.7.5. Progress Meeting Documentation and Reports

3.7.5.1. Contractor shall prepare, maintain, monitor and make available to the College, reasonable Project progress documentation including, but not limited to:

(1) Contractor's Daily Reports: listing weather conditions, trades on site, manpower, brief description of activities underway, quality control issues raised, commissioning activities underway and any safety or security issues encountered. Append Daily Reports from Subcontractors to the Contractor's Daily Report.
(2) Minutes from Pre-Construction and Pre-Installation conferences.
(3) Minutes from Contractor's Subcontractor and/or Foreman's meetings: including agenda topics, brief summary of issues discussed resolutions discussed and issues requiring attention.
(4) Inspection reports provided by Independent Testing Agencies and/or Laboratories, when applicable.
(5) Inspection reports provided by any authorities having jurisdiction on the Project.

3.8. REFERENCE DOCUMENTS FOR THE WORK

3.8.1. Conformance Documents

3.8.1.1. The College may issue conformance documents, incorporating all Addenda issued during the bid/proposal period into the Contract Documents, for the Contractor's convenience at the start of Work. It is the Contractor's sole responsibility to verify the accuracy of the conformance documents. At the Contractor's election, conformance documents may serve as the basis for Progress Documents. Use of such documentation shall not in any way relieve the Contractor from its responsibility to perform the Work in accordance with the Contract Documents. In the event of a discrepancy between the conformance documents and the Contract Documents, the Contract Documents shall govern.

3.8.2. Progress Documents

3.8.2.1. The Contractor shall keep one complete set of all Drawings, Specifications, Construction Progress Schedule, and shop drawings at the job-site current and in good order. As the Work progresses, the Contractor shall keep a complete and accurate record of all changes or deviations from the Contract Documents, indicating the Work as actually installed. All underground utility locations associated with the scope of work, or revealed during the conduct of the work, shall be

recorded by the Contractor's surveyor and referenced to a campus benchmark provided by the College. All such changes shall be neatly and correctly shown on black line prints of the drawings affected, or in the Specifications, with appropriate supplementary notes. This record set of prints of Drawings, shop drawings and Specifications shall be kept at the job site for inspection by the College's Project Manager and Architect/Engineer.

3.8.3. Record Documents

3.8.3.1. At the completion of the Work, the Contractor shall certify by endorsement thereof, that each of the revised prints of the Drawings and Specifications is complete and accurate. Prior to the Contractor's Application for Final Payment, and as a condition to its approval by the College, the Contractor shall assemble its record drawings and specifications, review them for completeness and submit them to the College's Project Manager. The Contractor shall provide suitable transfer cases and deliver the records therein, indexed and marked for each division of the Work.

3.8.3.2. No review or receipt of such records by the College's Project Manager shall be a waiver of any deviation from the Contract Documents or the Shop Drawings or in any way relieve the Contractor from its responsibility to perform the Work in accordance with the Contract Documents and the Shop Drawings to the extent they are in accordance with the Contract Documents.

3.9. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.9.1. After checking and verifying all field measurements and after complying with applicable procedures specified in the Contract Documents, Contractor shall submit to the College's Project Manager and Architect/Engineer, in accordance with the Contractor's schedule, Shop Drawings and other submittals which will bear a stamp or specific written indication that the Contractor has satisfied its responsibility under the Contract Documents with respect to the review of such submissions. The data on the Shop Drawings or submittal must be complete with respect to quantities, dimensions, specified performance and/or design criteria, materials and similar data to enable the Architect/Engineer to review the information as required. These documents shall be prepared in conformity with the best practice and standards for the trade concerned. Due regard shall be given to speed and economy of fabrication and erection.

3.9.2. Obtaining electronic documentation to aid in the preparation of Shop Drawings and submittals shall be the sole responsibility of the Contractor and may be subject to certain terms and conditions required by the Architect/Engineer and/or College. The College cannot guarantee that electronic documentation prepared by the Architect/Engineer will be made available to the Contractor. If provided, Contractor shall not be entitled to rely on such documentation for accuracy and use of such documentation shall not in any way relieve the Contractor from its responsibility to perform the Work in accordance with the Contract Documents.

3.9.3. The Contractor shall prepare and routinely update a submittal log indicating the status of submittals.

3.9.4. Unless otherwise indicated in the Contract Documents or agreed to by the College in writing, the Contractor shall send the College one copy of all Shop Drawings and product data coincident with the initial and any subsequent submissions to the Architect/Engineer. The College will forward any comments it desires to make to the Architect/Engineer within the designated review time.

3.9.5. In addition to the items noted in the Specifications as requiring Shop Drawings or other details, Shop Drawings and details shall be required for all items which are specifically fabricated for the Work or when the assembly of several items is required for a working unit.

3.9.6. The College's Project Manager and Architect/Engineer will examine the Shop Drawings and product data submittals with reasonable promptness. The College's Project Manager and Architect/Engineer will note whether they are approved, approved with corrections and/or conditions, or rejected. The Architect/Engineer will return the Shop Drawings and project data submittals with the final action to the

Contractor and also provide one copy each to the College and College's Project Manager.

3.9.7. The Contractor must allow the Architect/Engineer, College's Project Manager at least fourteen calendar days following receipt of each submittal or re-submittal of Shop Drawings and product data submittals to review the documents and respond to the Contractor. Items requiring longer than fourteen calendar days of review time will be identified in the Specifications. The minimum time allowed for the Architect/Engineer, College's Project Manager to review the submittal shall be increased to the extent that additional time for review is needed due to the fault or the responsibility of the Contractor or its Subcontractors and suppliers. The Contractor will be notified of the cause of the delay and advised of how long it will take to complete the review; provided, however, that mere failure to give the Contractor such notice shall not entitle the Contractor to compensation or a time extension.

3.9.8. When the Architect/Engineer, College's Project Manager or the College desires corrections, or rejects the Shop Drawings, the Contractor shall resubmit the Shop Drawings with the required corrections in a timely manner.

3.9.9. Unless the Contractor has, in writing, at the time of the submissions, expressly notified the Architect/Engineer, College's Project Manager and the College to the contrary, the College and the Architect/Engineer may assume that Shop Drawings and other submittals from the Contractor are in conformity with the Contract Documents and do not involve any change in the Contract price, or any change which will alter the space within the structure, or alter the nature of the building or Work from that contemplated by the Contract Documents, or constitute a substitution of material or equipment or a change in the Contract or the scope of Work. If the Contractor fails to give notice strictly in accordance with this subsection, approval of any Shop Drawing or submittal shall not be binding on the College.

3.9.10. The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, product data, samples and similar submittals until the respective submittal has been approved by the Architect/Engineer. Such Work shall be in accordance with accepted submittals. Work performed without approval shall be at the Contractor's risk.

3.9.11. Shop Drawings, product data, samples and similar submittals shall be marked, tagged, or otherwise properly identified with the name of the Contractor, the name of the Project, the purpose for which the samples are submitted, and the date and shall be accompanied by a letter of transmittal containing similar information, together with the Specification section number for identification of each item. Each tag or sticker shall have clear space for the stamps of the Contractor, College's Project Manager and the Architect/Engineer.

3.9.12. Samples of materials which are generally furnished in containers bearing the manufacturers' descriptive labels and printed application instructions shall, if not submitted in the standard containers, be supplied with such labels and application standards.

3.9.13. Should the Contractor consider any rejection or notation on the Shop Drawings or other submittals by the College's Project Manager or Architect/Engineer or any other action or inaction of the College's Project Manager or the Architect/Engineer to cause a change in the scope of the Work from that required by the Contract Documents, whether or not such change may affect contract price or time, then the Contractor shall desist from further action relative to the item in question and shall in writing (1) immediately notify the Architect/Engineer, the College and College's Project Manager requesting clarification; and (2) furnish them, within seven (7) days, with a notice explaining the nature of the change and whether increased or decreased cost and/or time is anticipated. No Work concerning the Shop Drawing or other submittal in question shall be executed until the entire matter is clarified and the Contractor is ordered by the College to proceed. Failure of the Contractor to serve written notice as required above shall constitute a waiver of any claim in relation thereto.

3.10. SITE INFORMATION, ACCESS, USE AND RESTRICTIONS

3.10.1. Site Information

3.10.1.1. Contractor shall review existing conditions and related College record information to become completely familiar with site and adjacent conditions. Contractor shall make arrangements to review available documentation and undertake explanatory site visits with College's Project Manager and Campus Facilities Office.

3.10.2. Campus Coordination Requirements

3.10.2.1. Contractor shall furnish a Site Mobilization Plan to the College's Project Manager for review and approval prior to the start of Work. Plan shall indicate features including proposed construction delivery route, materials and trash storage areas, site office and toilet facility locations, fencing, erosion control measures, tree and plant protection, temporary lighting, temporary traffic control measures and signage.

3.10.2.2. Contractor shall meet with Campus Facilities and Security Offices prior to the start of Work to review Contractor's proposed Site Mobilization Plan, and to coordinate Project needs with Campus Operations and Maintenance, House and Grounds-keeping and Security operations.

3.10.2.3. In the event that Contractor's operations affect or disrupt campus access roads and/or building entrances or exits, Contractor shall coordinate maintaining or re-directing access in accordance with the Contract Documents and following the direction and policies of the Campus Security Office and any affected emergency service providers.

3.10.2.4. Contractor shall meet with College's Environmental Safety Office prior to the start of Work for projects where Hazardous Materials Abatement or use of Hazardous or Toxic Substances is expected.

3.10.2.5. Any Utility shut down required must be scheduled with relevant utility Owner and Campus Facilities at least 5 days in advance.

3.10.2.6. Unless otherwise indicated in the Contract Documents, vehicular and pedestrian access to properties shall be maintained operational to the maximum possible extent. Driveways to private properties shall not be blocked. Sidewalks and crossings shall be kept open for the passage of pedestrians. Streets shall not be unnecessarily obstructed and, unless the College shall authorize the complete closing of a street, the Contractor shall take such measures as may be necessary to keep the street open for traffic. The Contractor shall provide and maintain suitable and sufficient provisions, including but not limited to flag persons, barricades, warning signs and detour signs, necessary for the protection of the work and safety of the public. All barricades, obstructions and signage shall be illuminated from sunset to sunrise, daily.

3.10.2.7. Parking at all campus locations is limited. Other than one or two spaces for supervisory personnel, parking space for construction site personnel in campus parking lots should not be anticipated. For Projects where Work is confined within a site construction fence, Contractor may provide limited parking for construction personnel within that fenced area as long as parking does not impede progress of the Work or impede access by emergency or campus service vehicles.

3.10.3. Coordination where Work is in or adjacent to an Occupied Existing Building

3.10.3.1. In cases where Work is scheduled to take place in or adjacent to occupied existing buildings, Contractor shall coordinate the Work as reasonably directed by the College's Project Manager to reduce impact of construction operations on building occupants.

3.10.3.2. Noise that disrupts classes cannot generally be tolerated. The Contractor shall notify the College's Project Manager before starting any Work which might disrupt classes. Notification shall

be given well in advance of any such situation in order that the Contractor and College's Project Manager
together can reach a mutually agreeable time in which the Work can be accomplished. Noise of a brief/infrequent nature may not be found necessary to reschedule. Always contact the College's Project Manager if in doubt. Any rescheduling required due to noise aversion will not be a cause for either a delay or cost claim.

3.10.3.3. When requested, Contractor shall provide a detailed adjacent Work coordination plan indicating information including schedule of activities, limits of disturbance, sequence of construction, access points and their management, barriers, interface with controls such as fire alarm, security or building automation systems operation, for areas that directly interface with or are affected by the Work.

3.10.4. Temporary Facilities

Unless otherwise indicated in the Contract Documents:

3.10.4.1. The Contractor shall be responsible for arranging with the College's Project Manager for general services and temporary facilities as required for the proper and expeditious prosecution of the Work; including but not limited to: use of toilets; temporary storage; temporary electrical power; and temporary water.

3.10.4.2. The Contractor shall, at its own expense, make all temporary connections to utilities and services in locations acceptable to the College's Project Manager and local authorities having jurisdiction thereof; furnish all necessary labor and materials, and make all installations in a manner subject to the acceptance of such authorities and the College's Project Manager; separately meter and pay for utilities (electricity, water, sewer, and telephone) consumed; maintain such connections; remove the temporary installation and connections when no longer required; restore the services and sources of supply to proper operating conditions.

3.10.4.3. The Contractor shall supply and maintain an office trailer or shed and a telephone, telefax, and/or computer on the site for the purpose of facilitating construction coordination and communication.

3.10.4.4. At the completion of the Work, Contractor's onsite facilities shall be removed, and the site restored to conditions that meet or exceed those existing at the start of Work.

3.10.5. Existing Utilities

3.10.5.1. The attention of the Contractor is directed to the likely presence of existing underground utilities and overhead utilities and poles located within the Work site. The Contractor is cautioned that some utilities may not be catalogued on College or utility service provider record documents. Further, due to depth and/or types of materials used, some utilities may not be identifiable using traditional utility service locating methods.

3.10.5.2. Where any underground services are expected to be encountered during construction, prior to the start of work, the Contractor shall:

(1) Review College record documents pertaining to affected underground services.
(2) Interview Campus Facilities office with regard to affected underground services.
(3) Call "Miss Utility" at least 48 hours in advance of construction for marking of public utilities.
(4) Be responsible for costs and coordination of utility locator services necessary to locate and mark any private utility services within the Work site, whether or not indicated on record or Contract Documents.
(5) Notify the College's Project Manager, Campus Facilities office, electric utility

company, natural gas supplier, providers of communications, and any affected utility or other organization with a right-of way in or immediately adjacent to the Work area at least one week prior to starting work in the areas in which services are located and cooperate with any organization who elects to have a representative present during the conduct of the Work.

3.10.5.3. The Contractor shall exercise special care not to damage or disturb the utility infrastructure in any way.

3.10.5.4. The Contractor shall carefully hand dig representative test pits across the full width of anticipated trenches to confirm utility locations and to reveal any unknown utility conditions for assessment prior to permitting use of mechanical excavation equipment.

3.10.5.5. All underground utility locations associated with the scope of Work, or revealed during the conduct of the Work, including the location, size and material of all water, sanitary sewer, storm sewer, gas, electric, telephone, data, fiber, cable television, duct banks, steam and chilled water utilities within the project area, shall be recorded by the Contractor's surveyor and referenced to a campus benchmark provided by the College, which is in Maryland State Plane NAD83(NSRS2007) horizontal datum; NAVD88 vertical datum.

Indicate rim and invert elevation of sanitary sewers, storm sewers and storm water management structures. For all sub-surface utility lines on the site, locate the first connection to the off-site system. The horizontal and vertical location of all subsurface utilities must be measured directly prior to backfill. Locations shall be recorded on project progress documents. Electronic record documentation, in AutoCAD format, is required at project close-out.

3.10.5.6. Contractor shall maintain utility paint marks and flags, showing utility location and depth, until work is complete and survey information is transferred to project progress documents.

3.10.5.7. Contractor shall notify the College's Project Manager and Campus Facilities Office when underground utilities are discovered that are not identified by prevailing industry standard marking methods (e.g. color-coded tape and trace wires for non-metallic utilities). Campus Facilities Office will coordinate proper marking of utilities prior to Contractor's completion of the Work.

3.10.5.8. In the event that utility service is damaged during the conduct of the Work, Contractor shall notify the College's Project Manager and Campus Facilities and Security Offices. Repair of damages resulting from Contractor's actions shall be the responsibility of the Contractor. Regardless of responsibility, Contractor shall immediately undertake necessary repairs, including conducting Work off-hours and/or on weekends, to ensure prompt restoration of service in order to minimize impact of unplanned utility outages on College operations.

3.10.6. Erosion Control

3.10.6.1. The Contractor shall incorporate all permanent erosion control features, where applicable, into the Work at the earliest practicable time and shall maintain them in proper condition during the course of the Contract.

3.10.6.2. Temporary measures shall be used to control conditions that develop prior to installation of permanent control features, or that are needed to temporarily control erosion resulting from normal construction practices. Temporary controls may include off site control measures where such Work is necessary as a direct result of Contractor's construction activity.

3.10.7. Tree and Plant Protection

3.10.7.1. Unless otherwise shown in the Contract Documents, the Contractor shall protect all trees

and plants which are liable to injury by construction operations and/or site mobilization plan.

3.10.7.2. Trees may not be used for any attachment or anchorage. Tree root zones shall be protected from overburden from construction traffic or storage of materials.

3.10.8. Snow and Ice Removal

3.10.8.1. Contractor shall provide snow and ice removal from within the project site area and from pedestrian or vehicular routes providing immediate access to or routing around the project site.

3.10.8.2. When the College is officially closed due to snow and ice conditions and the Contractor plans to work, it is the Contractor's responsibility to provide additional snow and ice removal, including removal beyond the site project limits, as necessary to provide access required by its Workers, Subcontractors and/or suppliers.

3.10.8.3. At all times, Contractor shall cooperate and coordinate his snow and ice removal activities with College's snow and ice removal activities.

3.10.9. Trash Removal: Salvage and Recycling

Unless otherwise indicated in the Contract Documents:

3.10.9.1. Salvage rights belong to the Contractor when the Project scope of Work includes demolition and removal of existing materials or equipment.

3.10.9.2. Contractor shall implement best recycling practices as part of its trash removal protocol, with particular attention to sorting and recycling corrugated cardboard packaging materials, wood pallets, paper products and metal products.

3.10.10. Project Signage

3.10.10.1. Contractor may place his identification signage for promotional purposes at the Project site, subject to review and approval by the College's Project Manager.

3.11 HAZARDOUS AND TOXIC SUBSTANCES

3.11.1. Hazardous and Toxic Substances

3.11.1.1. The Contractor shall comply with all applicable federal, state, bi-county and local laws, ordinances and regulations relating to hazardous and toxic substances, including such laws, ordinances and regulations pertaining to access to information about hazardous and toxic substances, in effect on the date of the Contract and as amended from time to time. The Contractor shall further comply with any special provisions or requirements, including more stringent provisions, mandated by any entity having jurisdiction, including but not limited to the Montgomery County Department of Environmental Protection.

3.11.1.2. At least ten (10) calendar days prior to commencing any on-site Work required by these Contract Documents, the Contractor shall compile, maintain and submit to the College's Project Manager a "Chemical Information List" which shall contain the following information for each hazardous and toxic substance used, manufactured, processed, formulated, packaged, repackaged, handled, reacted, transferred, or stored at the job site: the common name, the chemical name, and identification of the Work area in which the hazardous chemical is found. A copy of this list shall be posted at all times at the Contractor's on-site project office. This list shall be updated and maintained in a current status by the Contractor as to the hazardous and toxic substance used, manufactured, processed, formulated, packaged, repackaged, handled, reacted, transferred or

stored at the job site. The Contractor shall submit to the College's Project Manager an updated Chemical Information List at least 48-hours prior to the introduction of any additional hazardous and toxic substance not listed on the current Chemical Information List which is to be used, manufactured, processed, formulated, packaged, repackaged, handled, reacted, transferred or stored at the job site.

3.11.1.3. The Contractor shall provide the College's Project Manager at least 48-hours prior to commencing Work requiring the use of a hazardous and toxic substance with a "Material Safety Data Sheet" or, in the case of a controlled hazardous waste substance, a hazardous waste manifest, for each hazardous and toxic substance listed or subsequently added to the Chemical Information List in compliance with applicable laws, ordinances and regulations.

3.11.2. Asbestos-Containing Materials

3.11.2.1. The Contractor shall not use, install, or apply any asbestos-containing building materials on any Work. Any exception to this requirement must be requested in writing by the Contractor with an explanation of Work requirements. The College will review any such request and must approve in writing the use of any asbestos-containing building materials on any Work prior to use, installation or application. Upon completion of the Project and before final acceptance is issued by the College, the Contractor shall provide the College's Project Manager with written and notarized certification that it did not use, install or apply asbestos-containing materials.

3.11.3. Environmental Litigation

3.11.3.1. If the performance of all or any part of the Work is suspended, delayed or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation as defined below, or by the order of any state or federal agency or official enforcing applicable laws, such expense, delay or interruption shall be considered as if ordered by the College under Article 2, College's Right To Stop Or Suspend Work. If it is determined that the suspension, delay, or interruption is due wholly or in part to acts or omissions of the Contractor or breach or violation of the terms of this Contract or acts of the Contractor not required by this Contract, the Contractor shall be responsible for all additional costs and delays resulting from such acts or omissions. The term "environmental litigation" as used herein means a complaint filed in court alleging that the Work will have an adverse effect on the environment and that the College has not duly considered, either substantively or procedurally, the effect of the Work on the environment.

3.12. CUTTING AND PATCHING

3.12.1. The Contractor shall be responsible for any cutting, fitting, or patching, required to complete the Work or to make its parts fit together properly.

3.12.2. The Contractor shall not damage or endanger a portion of the Work or other construction of the College or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the College or a separate contractor except with written consent of the College and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the College or a separate contractor the Contractor's consent to cutting or otherwise altering its Work.

3.13. CLEANING

3.13.1. Progress Cleaning

3.13.1.1. The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract, and shall remove and dispose of waste materials or rubbish prior to the end of each working day.

3.13.1.2. If the Contractor fails to clean up as provided in the Contract Documents, the College's Project Manager may do so and the cost thereof shall be charged to the Contractor.

3.13.2. Final Cleaning

3.13.2.1. At completion of the Work the Contractor shall remove from and about the Work waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

3.13.2.2. Contractor shall wet clean all floors and surfaces or otherwise clean any equipment and materials installed in accordance with manufacturer's instructions.

3.14. ROYALTIES, PATENTS AND LICENSE FEES

3.14.1. The Contractor assumes the risk that any materials, equipment, processes or other items required under the Contract or furnished by the Contractor are subject to any patent, copyright, mark, secret or other property right of another. The Contractor shall pay for all royalties and license fees and shall obtain all necessary licenses or permits to permit use of any such item by the College. Contractor shall defend all suits or claims of infringement of any patent, copyright, mark, secret or other property right of another and shall save the College harmless from loss or expense on account thereof.

3.14.2. When an item specified by the College or furnished by the Contractor infringes or is alleged to infringe any patent, copyright, mark, secret or other property right of another, the Contractor will, at its option, and at no additional cost to the College, (1) procure for the College the right to use the item; (2) replace the item with an approved, non-infringing equal; or (3) modify the item so that it becomes non-infringing and performs substantially the same as the original item.

3.14.3. The review by the College of any method of construction, invention, appliance, process, article, device or material of any kind shall be for its adequacy for the Work, and shall not be an approval of the use thereof by the Contractor in violation of any patent or other rights or any third person.

3.15. INDEMNIFICATION

3.15.1 The Contractor shall be responsible for any property damage, loss, personal injury, death and/or any other damage which may occur by reason of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. The Contractor agrees to indemnify and save harmless the College and its respective employees, volunteers, students, and trustees, as applicable, (the "Indemnitees") from any claims, loss, costs, damages or other expenses suffered or incurred by the Indemnitees, including attorney's fees and costs, by reason of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. The Contractor at its own expense shall defend the Indemnitees in any action or suit brought against any of the Indemnitees arising out of the Contractor's acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement. Any acts, negligence, willfulness or failure to perform any of the obligations required by this Agreement on the part of any agent, servant, employee or Subcontractor of the Contractor, or any Subcontractor's agent, servant or employee, are deemed to be the Contractor's acts, negligence, willfulness or failure to perform any of the obligations defined by this Agreement.

3.15.2 In claims against any person or entity indemnified under subsection 3.15.1 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under subsection 3.15.1 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers or workmen's compensation acts, disability benefit acts or other employee benefit acts.

3.15.3. The College may retain such moneys due or to become due the Contractor under this Agreement as it considers necessary until such suits or claims for damages have been settled or otherwise disposed of

and satisfactory evidence to that effect has been furnished to the College.

3.15.4. The provisions of this Article shall survive the termination of the Agreement.

ARTICLE 4 – ADMINISTRATION OF THE CONTRACT

4.1. CLARIFYING INSTRUCTIONS

4.1.1. The College shall be the final interpreter of the Contract Documents. Through the College's Project Manager, the College will furnish, with reasonable promptness, such clarifications as it may deem necessary for the proper execution of the Work. Except as otherwise expressly provided in the Contract Documents, all recommendations by the Architect/Engineer and/or College's Project Manager with cost or schedule ramifications are subject to approval by the College. The Work shall be executed in conformity therewith and the Contractor shall do no Work without proper drawings and instructions. The Architect/Engineer and/or College's Project Manager have no authority to waive or change the requirements of the Contract Documents except to make minor changes in the Work which do not result in a claim for extra cost or time, and which are consistent with the intent of the Contract Documents.

4.1.2. Wherever typical parts or sections of the Work are completely detailed on the drawings and other parts or sections which are essentially of the same construction are shown in outline only, the complete details shall apply to the Work which is shown in outline.

4.1.3. Dimensions of Work shall not be determined by scale or rule. Figured dimensions shall be followed at all times. If figured dimensions are lacking on drawings, the Architect/Engineer shall supply them on request to the Contractor.

4.2. REQUESTS FOR INFORMATION

4.2.1. In the event that the Contractor requires clarifications on or discovers conflicts or discrepancies in the Contract Documents, the Contractor shall submit a "Request for Information", in a format suitable to the College's Project Manager and Architect/Engineer prior to proceeding with the Work.

4.2.2. Unless otherwise indicated in the Contract Documents, the Contractor shall prepare and routinely update an RFI log indicating the status of RFIs.

4.2.3. The Contractor must allow the Architect/Engineer, College's Project Manager and the College a reasonable time following receipt of each RFI to review the documents and respond to the Contractor. To the extent that additional time for review is needed to clarify the information submitted by the Contractor or its Subcontractors and suppliers, the Contractor will be notified of the cause of the delay and advised of how long it will take to complete the review; provided, however, that mere failure to give the Contractor such notice shall not entitle the Contractor to make a claim for additional compensation or a time extension. The Architect/Engineer will return the completed RFI response to the Contractor and also provide one copy each to the College and College's Project Manager.

4.2.4. The Contractor shall perform no portion of the Work requiring RFI response until the respective RFI response has been issued by the Architect/Engineer. Work performed without a response shall be at the Contractor's risk.

4.2.5. Should the Contractor consider any RFI response to cause a change in the scope of the Work from that required by the Contract Documents, whether or not such change may affect contract price or time, then the Contractor shall desist from further action relative to the item in question and shall in writing (1) immediately notify the Architect/Engineer, the College and College's Project Manager requesting clarification; and (2) furnish them, within seven (7) days, with a notice explaining the nature of the change and whether increased or decreased cost and/or time is anticipated. No Work related to the RFI shall be executed until the entire matter is clarified and the Contractor is ordered by the College to proceed. Failure

of the Contractor to serve written notice as required herein shall constitute a waiver of any claim in relation thereto.

4.3. SITE VISITS AND OBSERVATIONS

4.3.1. The College's Project Manager, and Architect/Engineer, shall at all times have access to the Work wherever it is in progress. The Contractor shall provide proper and safe facilities for such access and for visits at the place of manufacture or elsewhere.

4.3.2. Inspections by the College's Project Manager, or Architect/Engineer, are for the sole benefit of the College. If the Contract Documents, the College Project Manager's, or Architect/Engineer's instructions, or laws, ordinances or any public authority require any Work to be specially tested or reviewed, the Contractor shall give the College's Project Manager timely notice of the Work's readiness for inspection. If the Work is scheduled to be inspected by an authority other than the College's Project Manager, and Architect/Engineer, the Contractor shall inform the College's Project Manager of the date fixed for such inspection. Required certificates of inspection shall be secured by the Contractor. Inspections by the College's Project Manager and Architect/Engineer shall be made promptly and where practicable, inspections may be made at the source of supply.

4.3.3. If any Work has been covered up contrary to the requirements of the Contract Documents or instructions of the College's Project Manager or Architect/Engineer before it has been observed, such Work must, if required by the College's Project Manager and/or Architect/Engineer, be uncovered for observation and replaced and/or recovered, at the Contractor's expense.

4.3.4. If any questioned Work has been covered up which is not required to be observed by the College's Project Manager and/or Architect/Engineer prior to being covered, the College's Project Manager and/or Architect/Engineer may request to see the Work in question and it shall be uncovered by the Contractor as directed. If such Work is found to be in accordance with the requirements of the Contract Documents, the College shall reimburse the Contractor for the cost of such uncovering and recovering. Such reimbursement shall be limited to the direct cost incurred plus the Contract's approved percentage for overhead and profit. If the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall pay all costs associated with uncovering, correcting and recovering the Work.

4.3.5. The Contractor shall place its field engineers at the College's Project Manager's or Architect/Engineer's disposal for field checking during any inspection period. When layouts of the building and site work are to be made, the Contractor shall notify the College's Project Manager and Architect/Engineer in sufficient time so that the College's Project Manager and Architect/Engineer may be present.

4.3.6. Neither the presence nor the absence of the College's Project Manager or Architect/Engineer on the job shall relieve the Contractor from responsibility to comply with the provisions of the Contract Documents, nor from responsibility to remove and replace Work not in accordance therewith.

4.4. CLAIMS AND DISPUTES

4.4.1. Definition of Claim

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

4.4.2. Claims for Concealed or Unknown Conditions

4.4.2.1. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature which differ materially from those ordinarily found

to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then the Contractor shall give notice to the College's Project Manager promptly before conditions are disturbed and in no event later than fifteen (15) calendar days after first observance of the conditions. Upon receipt of such notice the College's Project Manager and Architect/Engineer will promptly investigate such conditions and if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work will determine an equitable adjustment in the Contract Sum or Contract time or both. No change in the Contract Sum or Contract time or both will be allowed except by formal approval of the College. If it is determined that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the College's Project Manager shall so notify the Contractor in writing stating the reasons. Claims by Contractor which dispute such a determination must be made in accordance with subsection 4.4.5.

4.4.3. Claims for Extension of Time

4.4.3.1. If the Contractor is delayed at any time in the progress of the Work by any act or omission of the College, or its employees or by any other contractor employed by the College, or by changes ordered in the Work, or by strikes, lockouts, fire, unavoidable casualties, or any causes beyond the Contractor's control, or by delay authorized by the College pending a decision, or by any cause which the College shall decide to justify the delay, the time of completion shall be extended for such reasonable time as the College may decide.

4.4.3.2. The Contractor may be entitled to a time extension, but no additional compensation, if the delay in the completion of the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, acts of the public enemy, acts of another contractor in the performance of a contract with the College, fires, floods, epidemics, quarantine restrictions, strikes, foreign embargoes, unusually severe weather, or delays of Subcontractors or suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the Subcontractor or suppliers, the time of completion shall be extended for such reasonable time as the College may decide.

4.4.3.3. Claims for extension of time will be considered by the College only if made in writing to the College. Any claim for an extension of time must be made within seven (7) calendar days of the occurrence of conditions which in the opinion of the Contractor warrant such an extension. Failure to submit a claim for an extension of time within seven (7) calendar days shall constitute a waiver of Contractor's right to claim or receive a time extension. In the case of a continuing cause of delay, only one claim is necessary. Within thirty (30) days of filing a time extension claim notice, the Contractor shall submit a clear written statement and relevant supporting documentation substantiating the claim. The documentation shall include a revised schedule, which conforms to the schedules submitted each month with the payment requests and which shows the duration of the delay, its relation to other activities, and how the alleged delay was on the critical path. No time extension will be allowed except by formal approval of the College. The College with advice and assistance from the College's Project Manager shall ascertain the facts and the extent of the delay and extend the time for completing the Work, when in the College's judgment the findings of fact justify such an extension. The College's findings of fact shall be final and conclusive on the parties, subject only to appeal as provided in section 4.5 of this Contract.

4.4.4. Claims for Equitable Adjustment for Delay

4.4.4.1 If a delay in completion of the Work is caused by the College and compensation is not provided for under Changes in the Work otherwise negotiated, and the Contractor's Work is materially affected by that delay, then the Contractor may be entitled to submit a claim for an equitable adjustment in compensation.

4.4.4.2 Schedule management within the Contract duration established at time of Bid/Proposal, including decisions that may alter sequencing of all or part the Work, does not constitute grounds for an equitable adjustment for delay claim from Contractor or its subcontractors or vendors. All prices are firm for the duration of the overall Contract term.

4.4.4.3 Only the following items may be recoverable by the Contractor as compensation or damages for delay:

(1) Direct costs, consisting of
   1. actual additional salaried and non-salaried on-site labor expenses;
   2. actual additional costs of materials;
   3. actual additional equipment costs, based solely on actual ownership costs of owned equipment or actual reasonable costs of rented or leased equipment;
   4. actual additional extended field office expenses, excluding those which are to be included in overhead;
   5. actual additional reasonable costs of Subcontractor and suppliers at any tier for which the Contractor is liable;

(2) actual additional costs proven by clear and convincing evidence, resulting from labor or other inefficiencies but only if proven by clear and convincing evidence; and

(3) an additional percentage for overhead and profit of 15% for actual additional Work performed by the Contractor's own forces and 5% for actual additional Work performed by a Subcontractor.

4.4.4.4. No claim under this subsection shall be allowed for any costs incurred more than twenty days before the Contractor shall have notified the College in writing of the delay.

4.4.4.5. No other compensation or damages are recoverable by Contractor for compensable delays or extensions of the completion time except as expressly stated herein. In particular, the College will not be liable for the following (by way of example and not of limitation) whether claimed by the Contractor or by a Subcontractor or supplier at any tier: (a) profit in excess of that provided herein; (b) loss of profit; (c) home office or other overhead in excess of that provided herein; (d) overhead calculated by use of the Eichleay formula or similar formulae; (e) consequential damages of any kind, including loss of additional bonding capacity, loss of bidding opportunities, and insolvency; (f) indirect costs or expenses of any nature except those expressly provided for herein; and (g) attorneys fees, costs of claims preparation and presentation, and costs of litigation.

4.4.4.6. There shall be deducted from the compensation payable to the Contractor under this section for delay any and all costs, expenses, and overhead recovered or recoverable by the Contractor under change orders issued to the Contractor or otherwise recovered or recoverable by the Contractor.

4.4.4.7. Contractor shall not be entitled to compensation or damages for delay unless, within seven (7) calendar days of the act, omission, occurrence, event or other factor alleged to have caused the delay, the Contractor notifies the College in writing of (a) the alleged delay and its anticipated duration; and (b) the act, omission, occurrence, event or other factor allegedly causing the delay. Knowledge on the part of the College or College's Project Manager of the act, omission, occurrence, event, or other factor or of the delay allegedly resulting there from, shall not excuse Contractor's failure to give the College the written notice required by this subsection.

4.4.5. Claims and Disputes Procedure

4.4.5.1. Unless a lesser period is prescribed by the Contract, the Contractor shall file a written notice of claim relating to the Contract, to the College's Project Manager within fifteen days after the basis of the claim is known or should have been known, whichever is earlier. Contemporaneously with, or within thirty days of filing of a notice of claim, but, as approved by College's Project Manager, no later than the date that final payment is made, the Contractor shall submit the claim to the College's Project Manager. The claim shall be in writing and shall contain:

(1) an explanation of the claim, including references to all Contract provisions upon which it is based;
(2) the amount of the claim;
(3) the facts upon which the claim is based;
(4) all pertinent data and correspondence that the Contractor relies upon to substantiate its claim. The Contractor shall submit such additional information as may be requested by the College's Project Manager; and
(5) a certification by a senior official, officer or general partner of the Contractor or the Subcontractor, as applicable, that, to the best of the person's knowledge and belief, the claim is made in good faith, supporting data are accurate and complete, and the amount requested accurately reflects the Contract adjustment for which the person believes the College is liable.

4.4.5.2. A notice of claim or a claim that is not filed within the time prescribed by subsection 4.4.5.1 or a lesser period prescribed elsewhere in the Contract shall be dismissed and the claim shall be considered to be waived.

4.4.5.3. Upon receipt of the Contractor's claim, the College's Project Manager, shall take steps deemed necessary to review and investigate the claim. These steps may include an investigation and review of the facts pertinent to the claim, requesting additional information or substantiation from the Contractor or anyone else and taking such other steps as the College's Project Manager may consider appropriate.

4.4.5.4. Following their investigation, the College's Project Manager shall issue a written opinion regarding the claim, which shall contain such information as they consider appropriate.

4.4.5.5. Pending resolution of a claim, the Contractor shall proceed diligently with the performance of the Contract in accordance with the College's Project Manager's opinion, order, finding or interpretation. The Contractor shall take all reasonable action to mitigate or to avoid costs or damages for which the College may be liable. The College Project Manager's decision shall be final and conclusive unless the Contractor files a written appeal to the Vice President of Facilities & Public Safety within fifteen days of the date of the College's Project Manager's opinion. The Contractor shall include in its appeal all of the information which it wants considered in the appeal. The Vice President of Facilities & Public Safety, in consultation with such other persons as deemed advisable, shall prepare and deliver a written decision to the Contractor. The Vice Presidents' response shall be the College's final decision.

4.4.5.6. If the Contractor does not appeal the College's Project Manager's decision to the Vice President of Facilities & Public Safety within the time required under subsection 4.4.5.5, then the College's Project Manager's opinion shall be considered to be final, conclusive and binding upon the Contractor and College. There shall be no further right of review either administratively or in the courts. If the Contractor's timely appeals the College's Project Manager's decision to the Vice President of Facilities & Public Safety, the Vice President of Facilities & Public Safety's decision shall be considered to be conclusive and final unless within thirty days from the date of the Vice President of Facilities & Public Safety' decision the Contractor requests submitting the dispute to non-binding mediation as a condition precedent to commencing an action in the Circuit Court for Montgomery County. If no action is commenced within thirty days after the date of the Vice President of Facilities & Public Safety's decision, the Vice President of Facilities & Public Safety's decision

shall be considered to be final, conclusive and binding on the Contractor and the College and the Contractor's right to appeal to the courts shall be waived.

4.4.5.7. If a court action is contemplated, all claims, disputes and other matters in question arising out of or related to the Contract or breach thereof shall first be submitted to non-binding mediation. Such mediation shall be in the nature of settlement discussions and privileged. The location of the mediation shall be in Rockville, Maryland.

4.4.5.8. The timely filing of a claim and the receipt of an opinion by the Contractor from the College's Project Manager, receipt of a decision from the College's Vice President of Facilities & Public Safety and pursuit of non-binding mediation are conditions precedent to filing an action in court. Any action which may be commenced against the College shall be filed in the appropriate state court in Montgomery County, Maryland. The Contract and disputes arising out of it shall be governed by the laws of the State of Maryland without regard to conflicts of laws provisions.

4.4.5.9. Claims by the College against the Contractor may be commenced at any time in any appropriate court without regard to the other provisions of the Contract Documents, including subsection 4.4. This right is in addition to all other rights which the College may have under the Contract Documents.

4.5. DELAYS AND DAMAGES

4.5.1. No Waiver of Delay

4.5.1.1. Except as may be expressly agreed otherwise by the College in writing, no action or inaction by the College or its Project Managers shall constitute a grant of an extension of the completion date or the waiver of a delay or other default by the Contractor, including: (1) schedule, a recovery schedule, or an anticipated completion date from Contractor; (2) allowance, approval or acceptance of any schedule; (3) failure to terminate for default at an earlier date; or (4) demand that the Contractor finish the project by the required completion date or by any subsequent date promised by the Contractor.

4.5.2. Mitigation of Delays and College Remedies.

4.5.2.1. If Contractor should at any time cause interference, stoppage or delay to the Project or any activity necessary to complete the Project by the time required by this Contract (collectively, "Delay"), Contractor shall take all reasonable action to avoid or mitigate the effects the Delays**,** including but not limited to: (1) rescheduling or re-sequencing the Work and (2) re-assigning personnel. When the Contractor is responsible for any Delay, the College may order the Contractor to accelerate construction, work overtime, add additional shifts or manpower, work on weekends, or to do anything else reasonably necessary in order to finish on time, at no additional cost to the College. The Contractor does not have the unilateral right to complete the Work late and pay liquidated or other damages.

4.5.2.2 If Contractor should at any time cause the Delays described in subsection 4.5.2.1, then in addition to any other remedies the College may have under the Contract, the College, after notifying Contractor that it has forty-eight (48) hours within which to cure the Delay, may attempt to remedy the Delay by whatever means the College may deem necessary or appropriate including, but not limited to, correcting, furnishing, performing or otherwise completing the Work, or any part thereof by itself or through others, (utilizing where appropriate, any materials and equipment previously purchased for that purpose by Contractor), or by supplementing the Contractor's forces. The Contractor shall be liable to the College for all costs incurred by the College in attempting to remedy the Delay. The College may deduct the cost to remedy the Delay from any monies due or to become due to the Contractor.

4.5.3. Severe Weather Delays

4.5.3.1. "Unusually severe weather" is weather which is more severe than the historical average for the month as evidenced by the National Weather Service for the locality of the Work. Time extensions for unusually severe weather will be allowed on a tentative basis only and the final decision will be reserved until the Work is substantially completed. Weather conditions prevailing throughout the entire Contract period will be considered, including consideration for abnormally mild conditions to offset abnormally severe conditions. Extension of time due to abnormal weather conditions will be granted

on the basis of one (1) calendar day for each normal working day lost, or as mutually agreed upon by the College and the Contractor. No additional compensation will be provided to the Contractor.

4.5.3.2. The College and the Contractor shall use the following table labeled “Monthly Anticipated Adverse Weather Days (in workdays)” as the basis for determining the anticipated number of “unusually severe weather” workdays at the construction site:

Monthly Anticipated Adverse Weather Days (in work days)											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4	5	4	5	5	3	3	3	2	4	4	4

A lost workday shall be considered a weather delay when unusually severe weather exists and when such weather conditions directly cause work to be delayed on the activity or activities which are on the critical path according to the latest accepted update of the schedule during that month. Weather-caused schedule losses shall be measured in half (0.5) workday increments if the unusually severe weather affects work at the site only for one half of a normal workday. If unusually severe weather occurs during the first half of a normal work and also delays work during the second half of the day (e.g., due to employees not being required to report to work due to unusually severe weather), the entire work day shall be considered a weather caused lost work day. The Contractor’s request for weather caused time extensions during a given month shall be considered only for actual work days lost in excess of the number of work days listed in the table above and meeting the above criteria. The Contractor shall meet the submission and notification requirements and follow the procedures for requesting time adjustments to the schedule as described in Section 4.4.3.

4.5.4. Liquidated Damages

4.5.4.1. It is agreed that time is of the essence and therefore the College will suffer substantial damages if the Work is not completed within the time stated in the Preliminary Project Schedule contained in the Contract Documents. For each day that the Work shall be uncompleted after the date set for Substantial Completion, the Contractor may be liable for liquidated damages in the amount specified in the Contract Documents. Prior to and after expiration of the Contract completion time, the College may withhold an amount equal to liquidated damages whenever the progress of construction is such that, due to the fault or responsibility of the Contractor, the Contractor, in the judgment of the College is behind schedule so as not reasonably to be able to permit completion of the Project on time. Due account shall be taken of excusable delays, any extensions of time reasonably due the Contractor for completion of additional Work under change orders, and for delays for which the College is responsible, provided that the Contractor has properly requested time extensions therefore. After submission of a price, the Contractor may not contest the reasonableness of the amount of liquidated damages stated in the Contract. These assessed damages shall not be considered as a penalty, but as mutually agreed upon as the ascertained damages suffered by the College because of the delay.

4.5.5. Waiver of Consequential Damages

4.5.5.1 The Contractor waives claims against the College for consequential damages arising out of or relating to this Contract. The waiver includes but is not limited to damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit of any type.

This waiver is applicable, without limitation, to all consequential damages due to Contractor in accordance with Article 12 of this Contract.

ARTICLE 5 – CONSTRUCTION BY COLLEGE OR BY SEPARATE CONTRACTORS

5.1 SEPARATE CONTRACTS

5.1.1. The College reserves the right to let other contracts in connection with the Project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and for the execution of their work, and shall properly connect and coordinate its Work with theirs. The Contractor shall work harmoniously with other contractors. The Contractor is not entitled to overhead, profit, or other compensation for work done for the College by other contractors.

5.1.2. If any part of the Contractor's Work depends on the proper execution or completion of any other contractor's work, the Contractor shall inspect and measure the work of the other contractor(s) and promptly report to the College's Project Manager any defects or discrepancies in such work. The Contractor's failure to inspect and make such a report shall constitute an acceptance of the other contractor's work as fit and proper for the proper execution of its Work, except as to latent defects.

5.1.3. The College's Project Manager will schedule and coordinate the Work of the Contractor with the work of all separate contractors on the Project including use of the site by the Contractor and the separate contractors. The College's Project Manager will keep the Contractor informed of the progress schedule to enable the Contractor to reasonably plan and perform its Work properly. The College's Project Manager may issue appropriate directions and require the Contractor to take such other measures as may be necessary to timely coordinate and progress the Work. Any neglect or refusal by the Contractor to comply with directions issued by the College's Project Manager shall constitute a failure to perform the Work in accordance with the Contract requirements and will justify action from withholding of payments otherwise due up to and including termination of the Contract.

5.1.4. The College and College's Project Manager do not guarantee the unimpeded operations of the Contractor. The Contractor acknowledges that the award of more than one contract for a Project necessitates the proper scheduling and sequencing of the Work with the work of all other contractors, and may lead to inherent delays in the progress of the Work. The Contractor agrees to re-sequence its Work as may be reasonably directed by the College's Project Manager from time to time. The Contractor hereby agrees to make no claim for delays caused by the presence or operations of other contractors engaged on the Project.

5.1.5. Should the Contractor sustain any damage through any act or omission of any other contractor having a contract with the College for the performance of work on the Project, or through any act or omission of a subcontractor of such other contractor, the Contractor shall make no claim against the College or its consultants (including but not limited to the Architect/Engineer and College's Project Manager) for such damage, but shall have a right to recover such damage from the other contractor under a provision similar to subparagraph 5.1.6 which has been or will be inserted in all contracts with such other contractors. The Contractor hereby releases the College, College's Project Manager and Architect/Engineer and their respective officers and employees from all damages to the Contractor caused by other contractors on the Project.

5.1.6. Should any other contractor under contract with the College for performance of work on the Project sustain any damage through any act or omission of the Contractor hereunder, or through any act or omission of a Contractor's subcontractor of any tier, the Contractor agrees to reimburse such other contractor for all

such damages and to indemnify and hold the College, College's Project Manager and Architect/Engineer harmless from all such claims, including attorneys' fees, to the fullest extent permitted by law.

5.1.7. The Contractor agrees that in the event of a dispute as to cooperation or coordination with other contractors on the Project, the College's Project Manager will act as mediator and decisions made by the College's Project Manager will be binding.

5.1.8. The Contractor shall fully cooperate and coordinate its Work with other contractors working on separate projects for other buildings, road work, and the like in accordance with College's Project Manager's direction.

5.1.9. Wherever work being done by any contractors or subcontractors is contiguous to Work covered by the Contract Documents, the respective rights of the parties shall be established by the College's Project Manager to secure the completion of the various portions of the Work in general harmony.

5.1.10. If a dispute arises among the Contractor and other contractors as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in these General Conditions, the College's Project Manager may direct who shall perform the cleanup. The College's Project Manager reserves the right to clean up and allocate the cost in a timely manner among those responsible as the College's Project Manager determines to be just.

ARTICLE 6 – CHANGES IN THE WORK

6.1. CHANGES IN THE WORK

6.1.1. Changes

6.1.1.1. The College unilaterally may, at any time, without notice to the sureties, if any, and without invalidating the Contract Documents, by written order designated or indicated to be an order, make any change in the Work including but not limited to changes in the Specifications, Drawings in the method or manner of performance of the Work, the College-furnished facilities, equipment, materials, services, or site or directing acceleration in the performance of the Work. Any other written order or an oral order, including a direction, instruction, interpretation, or determination from the College that causes or constitutes any such change shall be treated as a change order under this section provided that before performing the Work directed by the change that the Contractor gives the College's Project Manager written notice stating the date, circumstances and source of the order and that the Contractor regards the order as a change order. The Contractor shall not proceed to perform the Work described in the written or oral order unless the College's Project Manager acknowledges in writing to the Contractor that the order is a change order and that the Contractor is to proceed with the Work as a change.

6.1.1.2. If any change under this subsection causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the Work under the Contract, whether or not changed by an order, an equitable adjustment shall be made and the Contract modified in writing accordingly; provided, however, except for claims based on defective Specifications or Drawings, that no claim for any order under subsection 6.1.1.1 above shall be allowed for any cost incurred more than twenty days before the Contractor gives written notice as therein required. In the case of defective Specifications or Drawings for which the College is responsible, the equitable adjustment shall include any increased costs reasonably incurred by the Contractor in attempting to comply with such defective Specifications or Drawings. The Contractor shall submit to the College Project Manager within ten (10) days after every ninety (90) days from the order to proceed with the Work a detailed list of all costs incurred attempting to comply with defective Specifications or Drawings during the immediately preceding ninety (90) day period until the effect of the defects are overcome. Costs included more than ninety (90) days old in a detailed list of costs are waived and will not be paid.

6.1.1.3. If the Contractor intends to assert a claim for an equitable adjustment under subsection 6.1.1, it shall, within thirty days after receipt of an order for the furnishing of written notice under subsection 6.1.1.1 submit to the College's Project Manager a written statement setting forth the general nature of the monetary extent of the claim.

6.1.2. Disputed Work

6.1.2.1. In the event of a dispute between the College and the Contractor as to whether any Work is included in the scope of the Contract, such that the Contractor will be obligated to provide that Work at no additional cost to the College, the College's Project Manager may order the Contractor in writing under this section to perform the Work. If the Contractor considers such an order to be a change in the scope of the Contract entitling the Contractor to additional compensation, a time extension, or other relief, the Contractor must provide notice within seven days (7) from receipt of the College's Project Manager's written order under the section to perform the Work and to initiate a claim therefore in accordance with Contract requirements.

6.1.2.2. A request by the Contractor for additional time or additional costs caused by the impact of an order of the College on the critical path for completion must be accompanied by (a) a reasonably detailed description of the effect of the order on the adjusted critical path and (b) supporting documentation. The mere existence of a change order does not entitle the Contractor to an extension of time, compensation for delay or damages or costs associated with delay. Contractor's entitlement thereto shall depend upon the effect of the change order on the adjusted critical path for completion and shall be subject to the requirements of Article 3.7, Prosecution and Progress of the Work.

6.1.2.3. Upon receipt of a signed written order of the College's Project Manager under this subsection, the Contractor shall comply with the order promptly, within the requirements of the completion schedule, whether or not the Contractor signs or accepts the change order. Failure to comply with the order in a timely manner shall constitute a breach of the Contract and grounds for termination for default or any other remedy available to the College.

6.1.3. Modification of Contract Sum

6.1.3.1. When changes in the Work may require a modification of the Contract Sum, the Contractor shall provide to the College's Project Manager, within thirty (30) days of its receipt of a proposal request, an itemized breakdown showing quantities, unit costs, hours and rates of labor, and other costs in such detail as may be required to allow the reasonableness of the cost to be established. Similar cost information covering Subcontractor's Work shall be included as part of the Contractor's proposal. Minimum charges for "handling" will not be acceptable. Charges for general supervision and management will not be acceptable.

6.1.3.2. Modification of the Contract Sum, when required, shall be determined as follows:

(1) When applicable unit prices are stated in the Contract or have been subsequently agreed upon, by application of such unit prices.
(2) A lump sum price agreed upon by the College and the Contractor.
(3) If job conditions or circumstances or the extent or nature of the change, or failure of the College and the Contractor to agree upon a lump sum price or the application of unit prices, prevent the determination of the cost of any proposed change, the Work shall be paid pursuant to subsection 6.1.3.4.
(4) If a change involves a credit to the College, unless the amount must be determined by the application of unit prices, the amount of the credit shall be the greater of (a) the alternate or other itemized price for such Work stated in Contractor's price or (b) a reasonable price, including profit and overhead.
(5) If the change involves both a credit and a debit, the sums shall be shown and the

two sums balanced to determine the adjusted total cost or credit.

(6) The mark up allowable to the Contractor for combined overhead and profit for Work performed solely by the Contractor with its own forces shall be a reasonable amount, but not to exceed 15% of the Contractor's costs (excluding items includable in overhead).

(7) The mark up allowable to a Subcontractor for combined overhead and profit for Work performed solely with its own forces shall be a reasonable amount, but not to exceed 15% of the Subcontractor's cost of labor and materials and equipment. Mark ups for Sub-subcontractors or suppliers, if required, must be provided from within the markup allowance provided to the Subcontractor. No additional markup allowance will be allowed for Sub-subcontractors or suppliers. For Work performed by a Subcontractor solely with its own forces, the Contractor is entitled to a reasonable mark up for combined overhead and profit, but not to exceed 5% of the Subcontractor's labor, materials and equipment cost.

Sample Maximum Mark-Up Calculation:

A.	Subcontractor's cost (LME) *(includes direct costs of Subsubcontractors and/or suppliers)*	= A
B.	Subcontractor's combined OH&P	= 15% of A
C.	Subcontractor's Bonds and Builder's Risk Insurance if required	= as a % of A+B
D.	Contractor's combined OH&P	= 5% of A
E.	Contractor's Bonds and Builder's Risk Insurance if required	= as a % of A+B+C+D
F.	Total Maximum Modification of Contract Sum:	= A+B+C+D+E

(8) The Contractor shall be allowed the actual, reasonable additional cost for rental of machine power tools or special equipment, including fuel and lubricants which are necessary to execute the Work required on the change, but no percentage shall be added to this cost.

(9) The Contractor and separately bonded subcontractors, if any, shall be allowed the actual, reasonable additional cost for Bonds and Builder's Risk Insurance, if required.

6.1.3.3. The allowable percentages for cost and overhead and profit as provided in subsections 6.1.3.2 (6) and (7) and elsewhere are deemed to include but not be limited to all costs and expenses of the following kinds: project management, supervision and coordination; job supervision and field office expenses required by the Contract; expenses for supervisors, superintendents, managers, timekeepers, clerks and watchmen; cost of correspondence of any kind; insurance not specifically mentioned herein; all expenses in connection with the maintenance and operation of the field office, use of small tools, cost of vehicles generally used for transporting either Workers, materials, tools or equipment to job location and incidental job burdens; and all expenses or maintenance for operation of Contractor's regularly established principle office, branch office, similar facilities and all other costs and expenses customarily classified as overhead or general conditions. The Contractor's entitlement to compensation or additional time for delays for which the College is responsible or for which an extension is due to the Contractor is also subject to section 4.5.

6.1.3.4. If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the College on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit as stated in subsection 6.1.3.2 (6) and (7). In such a case, the Contractor shall keep and present in such form as the College's Project Manager may prescribe an itemized accounting together with appropriate supporting data. The itemized accounting shall be prepared daily and presented to the College's Project Manager at the conclusion of each day. Unless otherwise provided in the Contract

Documents, reimbursable costs to the Contractor shall be limited to the following:

(1) Costs of labor, including Social Security, old age and unemployment insurance, fringe benefits required by agreement or custom and Workers' compensation insurance;
(2) Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
(3) Rental costs of machinery and equipment exclusive of hand tools, whether rented from the Contractor or others; and
(4) Cost of premiums for all bonds and insurance and permit fees related to the Work, provided that, the penal sum of the surety bond has been increased and the surety has increased the premium cost to the Contractor.
(5) Pending final determination of the costs accumulated pursuant to subsection 6.1.3.4, amounts not in dispute may be included in an Application for Payment.

6.1.3.5. The College's Project Manager will review and make a recommendation regarding the adjustment in Contract Sum and/or Time proposed by the Contractor to the College. Only the College is authorized to approve adjustments in Contract Sum and/or Time. Approval by the College requires review and administrative processing, based on claim value, in accordance with the Board of Trustees Policy and Procedures, and the following schedule:

- Claims less than $ 99,999 require review and approval by the College's Vice President for Facilities & Public Safety.
- Claims between $ 100,000 and $ 249,999 require review and approval by the College's Vice President for Administrative and Fiscal Services.
- Claims $ 250,000 and greater require approval by the College's Board of Trustees as an action item at a monthly business meeting. Items requiring such approval must follow Board of Trustees agenda action item submission requirements. (Normally, action items are placed on the Board meeting agenda at least one month prior to the scheduled meeting date to allow time to conduct necessary internal administrative reviews prior to the Board meeting.)

6.1.4. Minor Changes in the Work

6.1.4.1. The College's Project Manager will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order of the College's Project Manager and shall be binding on the College and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 7 – PAYMENTS AND COMPLETION

7.1. SCHEDULE OF VALUES

7.1.1. To facilitate checking the Work performed, the Contractor shall furnish to the College's Project Manager a detailed Schedule of Values of the various parts of the Work, including quantities, aggregating to the Contract Sum. The schedule shall be divided so as to facilitate payments to Subcontractors, if any, made out in the form prescribed by the College's Project Manager, and, if required, supported by such evidence of its correctness as the College's Project Manager may direct. The Schedule of Values cost breakdown shall be used as a basis for Certificates of Payment unless it is found to be in error.

7.1.2. The Schedule of Values shall be submitted as soon as possible, but not less than fifteen (15) days prior to the first scheduled Application for Payment described in the General Conditions.

7.2. PROGRESS PAYMENTS

7.2.1. Application for Payment

7.2.1.1. No later than the 25th day of each month, the Contractor shall submit to the College's Project

Manager an original and accurate Application for Payment dated the last day of the month in the form prescribed by the Contract Documents together with the supporting documentation listed herein. Applications for Payment received after the 25th day of each month, or not submitted on an original, or containing erroneous information, or missing the required supporting documentation, shall not be processed during that month's payment cycle. Payments shall be made on the value of Work expected to be completed up to and including the last day of the month based upon the labor and materials incorporated in the Work; and of materials suitably stored at the site; less the aggregate of any previous payments, retainages and amounts withheld under subsection 7.2.1.9. The Applications for Payment, including final payment, shall be reviewed and certified by the College's Project Manager. After reviewing and certifying the amounts due the Contractor, the College's Project Manager will
submit the Project Application and the Project Certificate for Payment, along with the Contractor's Applications and Certificates for Payment, to the Architect/Engineer. Based on the Architect/ Engineer's observations and valuations of Contractor's Applications for Payment, and the Certifications of the College's Project Manager, the Architect/Engineer will review and certify the amounts due the Contractor and will issue a Project Certificate for Payment.

(1) The Contractor shall promptly pay each Subcontractor, if any, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which each Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of the Subcontractor's Work. The Contractor may not withhold from the Subcontractor any portion of the payment due to any cause unrelated to the Subcontractor's performance of the Work on the Project, notwithstanding any prior agreement between Contractor and Subcontractor to the contrary.

7.2.1.2. No later than the 25th day of each month, each Application for Payment shall be supported by the following documentation, each in a form prescribed by the College, or in the case no form is prescribed, on a form provided by the Contractor and approved by the College's Project Manager:

(1) Updated schedule information of Contractor's progress to date, including assessment of progress compared to scheduled completion date.
(2) Subcontractors' certificates, statements and affidavits showing that portions of the Work covered by the Application for Payment have been completed and material included therein have been and will be delivered.
(3) Affidavit from Contractor and Subcontractor on forms prescribed by the College, stating respectively that their work force, subcontractors, vendors and material suppliers have been paid from the proceeds of the last Application for Payment, and will be paid from the current Application for Payment, and that there are no outstanding claims for payment.

7.2.1.3. That part of the payment which is requested on account of materials delivered and suitably stored at the site or other approved location but not incorporated in the Work shall, if required by the College's Project Manager, be conditioned upon submission by the Contractor of bills of sale or upon such other procedure as will establish the College's title to such material or otherwise adequately protect the College's interest as determined by the College's Project Manager, including applicable insurance coverage and cost of transportation to the Project site for those materials and equipment stored off the site.

7.2.1.4. Provided that the Contractor has furnished acceptable payment and performance security equal to 100% of the Contract Sum, from each Application for Payment the College shall withhold as retainage no more than 5% of the amount earned. Unless otherwise agreed to by the College in writing, the retainage withheld shall be paid within 120 days after satisfactory completion of the Contract or within 120 days after resolution of a dispute or contract claim concerning the satisfactory completion of the Contract, whichever is later. The College reserves the right to withhold from payments otherwise due the Contractor any amount that the College reasonably believes necessary

to protect its interest, including, but not limited to, the College concluding in its sole judgment that the Work may not be completed by the date required by the Contract or the Work is otherwise not in conformance with the requirements of the Contract Documents. Following Substantial Completion of the Project, the College in its sole discretion, may authorize reduction of retainage withheld to an amount not less than two (2) times the College's Project Manager's estimate of the value of the Contractor's punch list items.

7.2.1.5. Application for Payment shall be in the format required by the Contract Documents and the College's Project Manager. The Application shall include an itemized breakdown of the various items of the Work based on the previously submitted Schedule of Values.

7.2.1.6. The provisions for payment, withholding, retainage and Certificates of Payments are solely for the benefit of the College, and no other party (including sureties of the Contractor) may assert any claim for negligence or other action against the College, or anyone acting on behalf of the College for waiving or misapplying these provisions.

7.2.1.7. No Certificate issued nor payment made to the Contractor may be construed as an acceptance of the Work or be construed or relied upon as any indication that the labor or materials are in accordance with the Contract Documents or that the amounts paid or certified therefore represent the correct cost or value of the Work or that such amounts are in fact or law due the Contractor.

7.2.1.8. Any Application for Payment which is based on a pending claim for additional compensation may be certified by the College's Project Manager and the Architect/Engineer to the extent that it is determined that the payments yet to be made under the Contract and/or the retainage are sufficient to protect the College. Nothing herein shall be construed as requiring the College's Project Manager and Architect/Engineer to certify such applications or to release retainage. All certifications and payments, including those pursuant to a pending claim, shall be tentative and conditional.

7.2.1.9. In addition to the College's general right to withhold payment as set forth in subsection 7.2.1.4, the College may withhold payment or, on account of subsequently discovered evidence, nullify or reduce the whole or part of any certificate or payment on account of:

(1) failure to update schedules properly as required by subsection 3.7;
(2) failure to furnish the documents required by subsection 7.2.1.1 and 7.2.1.2;
(3) liquidated damages which may be assessed under the Contract Documents or other damages or compensation due the College for claims of the College against the Contractor;
(4) the cost (measured by the contract value or fair market value whichever is greater) of completing unfinished or defective Work not remedied or deductions or amounts due the College under the Contract;
(5) failure of the Contractor to perform any material Contract requirements;
(6) claims filed or likely to be filed against the College for which the Contractor may be liable to the College;
(7) failure of the Contractor to make payments properly to Subcontractors or suppliers for material or labor or amounts claimed by the Contractor's surety or insurer under any right of subrogation;
(8) a reasonable doubt the Work can be completed for the residual balance of the Contract;
(9) damage to another Contractor;
(10) any claim of the College or debt owed to the College by the Contractor;
(11) failure to maintain as-built drawings; or
(12) the cost of completing unfinished warranty Work.

7.3. ACCEPTANCE OF THE WORK AND FINAL PAYMENT

7.3.1. Partial Acceptance

7.3.1.1. If, in its sole discretion, the College desires to occupy any portion of the Work, the College shall have the right to occupy and use those portions of the Work which in the opinion of the College can be used for their intended purpose; provided that the conditions of occupancy and use are established and the responsibilities for the Contractor and the College for maintenance, heat, light, utilities and insurance are mutually agreed to by the Contractor and the College. The College has no obligation to accept the Work in portions. Partial occupancy shall in no way relieve the Contractor of its responsibilities under the Contract.

7.3.1.2. When the College occupies the Work in portions or accepts the Work in portions, if the beneficial use of any accepted portion of the Work as a whole depends on Substantial Completion or beneficial use of any other portion, then, unless otherwise agreed to by the College in writing: (1) warranties on the accepted portions do not begin to run until substantial completion of all portions on which beneficial use of the whole Work depends, and (2) Substantial Completion of the whole Work shall not be deemed to be achieved until Substantial Completion of all portions on which beneficial use of the whole depends.

7.3.2. Substantial Completion and Final Inspection

7.3.2.1. When the Work is substantially completed, the Contractor shall notify the College's Project Manager and Architect/Engineer in writing that the Work will be ready for final inspection and testing on a definite date. Reasonable notice shall be given by the Contractor to permit the College's Project Manager and Architect/Engineer to schedule the final inspection.

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

7.3.2.2. The inspection shall be conducted by the College's Project Manager and the Architect/Engineer. On the basis of the inspection, if it is determined that the Work appears to be substantially complete and the Work appears to be ready for occupancy and usable for its intended purpose, the College's Project Manager and Architect/Engineer shall establish the date of Substantial Completion, shall fix the times at which the warranties will begin, and the Architect/Engineer shall issue a Certificate of Substantial Completion.

7.3.2.3. If it is determined that Substantial Completion has been achieved, the College's Project Manager shall fix the time within which the Contractor shall complete any remaining items of Work which will be indicated on a list (the "punch list"). If the Contractor fails to complete the remaining items so listed in the time stipulated, the College shall have the undisputed right to complete the Work at the Contractor's expense. The Contractor may be required to complete multiple punch lists until the Contract is performed in its entirety. Failure to complete punch list work in a timely manner shall constitute grounds for termination of the Contract for default. Final payment shall not be made until all Contract Work, including all punch list Work, is complete to the satisfaction of the College's Project Manager.

7.3.2.4. Acceptance of the Work as substantially complete shall not excuse or waive any failure of the Contractor to complete the Contract as required by the Contract Documents. The Work shall not be considered substantially complete until (1) all electrical, mechanical, and life safety systems shall be completed and successfully tested and successfully inspected for conformity to all requirements of the Contract Documents and all applicable codes and standards, (2) a certificate of occupancy has been obtained for all parts of the Work and (3) all other requirements for Substantial Completion are met.

7.3.2.5. Upon completion of the Work, the Contractor shall forward to the College's Project Manager a written notice that the Work is ready for final inspection and acceptance and shall also forward to

the College's Project Manager a final Application for Payment. The final Application for Payment shall be processed in accordance with Subparagraph 7.3.3. Upon receipt, the College's Project Manager will forward the notice and Application to the Architect/Engineer who with the College's Project Manager will promptly make such inspection. When the Architect/Engineer, based on the recommendation of the College's Project Manager, finds the Work acceptable under the Contract Documents, the Architect/Engineer shall issue a Final Application and Certificate for Payment stating that the Work provided for in the Contract has been completed and is acceptable under the terms and conditions thereof and that the entire balance found to be due to the Contractor and noted in the final application is due and payable. The College's Project Manager and Architect/Engineer may not issue the Final Certificate and Application for Payment until all Work is fully completed and all other obligations of the Contractor under the Contract Documents have been completed.

7.3.3. Application for Final Payment

7.3.3.1. Upon completion of the Work, the Contractor shall prepare and submit to the College's Project Manager an Application for Final Payment. The College's Project Manager and Architect/Engineer will promptly proceed to make any necessary final surveys, to complete any necessary computations of quantities, and to complete other activities necessary to determine the Contractor's right to final payment. The College's Project Manager and Architect/Engineer will certify so much of the Contractor's Application for Final Payment as they consider due, The Contractor shall be informed of all deductions, damages, costs, back-charges, and other charges assessed against the Contractor by the College and the reasons therefore. Notwithstanding what is stated above, prior to or in the absence of a request from the Contractor for final payment, the College may determine the amount of the final payment it considers to be due to the Contractor.

7.3.3.2. If the Contractor disputes the amount determined by the College to be due it, it may initiate a claim under Article 4.4, Claims and Disputes.

7.3.3.3. Acceptance by the Contractor of any payment identified by the College as being a final payment shall operate as an accord and satisfaction and a general release of all claims of the Contractor against the College arising out of or connected with the Contract, except as may be expressly agreed otherwise in writing between the Contractor and the College. No claims by the Contractor may be asserted for the first time after the Contractor submits its Application for Final Payment or after final payment is made by the College.

7.3.3.4. Prior to final payment and before issuance of the College's Project Manager's and Architect/Engineer's final Certificates therefore, the Contractor shall fully comply with the following requirements:

(1) Cleanup the Work area in accordance with the Specifications and federal, state, bi-county, county and local rules and regulations.
(2) Provide a notarized affidavit stating that all monetary obligations to suppliers of material, services, labor and all Subcontractors have been completely fulfilled and discharged.
(3) Complete all punch list Work and furnish to the College's Project Manager all documents, manuals and record (as-built) documents, including all BIM documents, if any.

7.4. ASSIGNMENT OF CONTRACT MONIES

7.4.1. The Contractor shall not assign any monies due to it under the Contract without the consent of the College, and the assignee in such case shall acquire no rights against the College.

7.5. AUDIT

7.5.1. If the Contractor has submitted any claim or request for additional payment exceeding $50,000, or If the Contractor has submitted cost or pricing data in connection with the pricing of any modification to this

Contract, the College shall have the right to examine and audit all books, records, documents, and other data of the Contractor (including computations and projections) related to negotiating, pricing or performing the modification or claim in order to evaluate the accuracy, completeness, and currency of the cost or pricing data. In addition to the above, the Contractor shall make available to the College the original project price estimate and backup takeoffs and records, and the actual monthly or periodic job cost records. If the Contractor fails or refuses to comply with applicable provisions concerning the Contract changes or claims, the College shall have no obligation to make payment to the Contractor for the change or claim.

7.5.2. The Contractor shall permit audit and fiscal and programmatic monitoring of the Work performed under this Contract. The Contractor shall make available at its office at all reasonable times, the materials described in subsection 7.5.1, for examination, audit or reproduction, for 3 years after final payment under the Contract.

7.5.3. If the Contract is completely or partially terminated, the records relating to the Work terminated shall be made available for 3 years after any resulting final termination settlement.

7.5.4. Records pertaining to claims, contract disputes, or to litigation or the settlement of claims arising under or relating to the performance of the Contract shall be made available until final disposition of such appeals, litigation, or claims.

ARTICLE 8 – PROTECTION OF PERSONS AND PROPERTY

8.1. SAFETY PRECAUTIONS AND PROGRAMS

8.1.1. The Contractor shall comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss.

8.1.2. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. Contractor shall comply and cooperate with College safety and security programs.

8.1.3. Except as otherwise directed by the Contract Documents, in the event the Contractor encounters on the site material reasonably believed to be hazardous, including but not limited to asbestos or polychlorinated biphenyl (PCB), which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the College's Project Manager in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the College's Project Manager and Contractor if in fact the material is hazardous and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of hazardous material.

8.2. PROTECTION OF PERSONS AND PROPERTY

8.2.1. The Contractor shall take all necessary precautions to ensure the safety of the public and of workers on the job, and to prevent accidents or injury to any persons on, about, or adjacent to the premises where the Work is being performed. The Contractor shall comply with the "Williams-Steiger Occupational Safety and Health Act of 1970, as amended, and all laws, ordinances, codes, rules and regulations relative to safety and the prevention of accidents, and shall also comply with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America and with the applicable provisions of the American Standard Safety Code for Building Construction, ANSI A 10 Series, unless prevention of accidents is regulated by a more stringent local, State or Federal code, ordinance or law. The Contractor shall erect and properly maintain at all times, as required by laws and regulations and the conditions and progress of the Work, proper safeguards, including minimum provision of six (6) foot fall protection, for the protection of Workers and the public and shall post signs and other warnings against the dangers created by openings, stairways, falling materials, open excavations and all other hazardous or unsafe conditions. It shall be the Contractor's exclusive responsibility to take all safety precautions which may be necessary to protect all persons and property from injury or damage.

8.2.2. Contractor shall request permission in writing of the College's Project Manager, and have received written permission from the College's Project Manager, prior to the storage, use, or transportation onto the campus of explosives or other hazardous materials or equipment required for the execution of the Work. The Contractor is prohibited from storing, using or transporting hazardous materials or equipment not required for the execution of the Work onto the campus. The Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel if such written permission has been granted.

8.2.3. All damage or loss to any property referred to in this section, caused in whole or in part by the Contractor, and Subcontractor, and sub-subcontractor, or anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable, shall be remedied by the Contractor, except damage or loss attributable solely due to faulty Drawings or Specifications or to the acts or omissions of the College or Architect/Engineer or anyone employed by either of them or for whose acts either of them may be liable, and not also attributable to the fault or negligence of the Contractor.

8.2.4. The Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the College's Project Manager.

8.2.5. Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

8.2.6. In any emergency affecting the safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency Work shall be determined as provided for in these General Conditions.

8.2.7. The Contractor shall continuously protect the Work and the College's property from damage, injury or loss arising in connection with operations under the Contract Documents. It shall make good any such damage, injury or loss, except such as may be caused solely by agents or employees of the College.

8.2.8. The Contractor shall be solely responsible for all damage due to intrusion and for the proper protection of the Project site from damage due to fire, rain, wind or other causes. The Contractor shall provide sufficient security personnel as it deems necessary for proper protection of the Work and project site at all times. The Contractor shall provide temporary protection to prevent unauthorized persons from obtaining access to the site during the night and at other non-working hours.

8.2.9. The Contractor shall assume sole financial responsibility for vandalism or loss of materials and equipment not covered by Contractor's Builder's Risk insurance.

8.2.10. The Contractor shall protect all streets, sidewalks, light poles, hydrants and concealed or exposed utilities of every description affected by or adjacent to the Work and if such items are damaged by the Contractor or Subcontractors, the Contractor shall make all necessary repairs thereto or replacements thereof at no cost to the College.

8.2.11. Tight wood sheathing or plywood shall be laid under any materials that are stored on finished cement surfaces.

8.2.12. The Contractor shall at all times provide and maintain adequate protection against weather so as to preserve all Work, materials, equipment, apparatus and fixtures free from injury or damage.

8.2.13. The Contractor shall provide and maintain adequate protection for all properties adjacent to the site. When required by law or for the safety of the Work, the Contractor shall shore up, brace, underpin and protect as necessary, foundations and other portions of existing structures which are in any way affected by the operations under the Contract Documents. The Contractor, before commencement of any part of the

Work, shall give any notices required to be given to an adjoining landowner or other parties.

8.2.14. The Contractor shall confine its construction equipment, the storage of materials and the operations of workers to the limits indicated by laws, ordinances, permits and as may be established by the College, and shall not unreasonably encumber the premises with construction equipment or material.

8.2.15. The Contractor shall enforce the College's Project Manager's instructions regarding signs, advertisements, fires and smoking.

8.3. FIRE PROTECTION

8.3.1. Adequate precautions shall be taken against fire throughout all the Contractor's and Subcontractors' operations. Flammable material shall be kept at an absolute minimum, and, if any, shall be properly handled and stored. Except as otherwise provided herein, the Contractor shall not permit fires to be built or open salamanders to be used in any part of the Work.

8.3.2. Construction practices, including cutting and welding, and protection during construction shall be in accordance with the published standards of the Industrial Risk Insurers and the National Fire Protection Association; provide a sufficient number of approved portable fire extinguishers, distributed about the project; and use non-freeze type in cold weather.

8.3.3. Gasoline and other flammable liquids shall be stored in and dispensed from Underwriters' Laboratories listed safety containers in conformance with the National Fire Protection Association recommendations. Storage of any flammable liquids, however, shall not be within buildings.

8.3.4. All tarpaulins that may be used for any purpose during construction of the Work shall be made of material which is resistant to fire, water and weather. All tarpaulins shall have the Underwriters' Laboratories approval and shall comply with FS CCC-D-746.

8.3.5. The Contractor shall maintain emergency and fire exits from the Work area, or establish alternative exits satisfactory to the Fire Marshal.

8.3.6. Fire protection and safety during the execution of the Work are the exclusive responsibility of the Contractor.

8.4. EMERGENCIES

8.4.1. In an emergency affecting the safety of life, the Work or adjoining property, the Contractor, without special instructions or authorization from the College's Project Manager, is permitted to act at the Contractor's discretion to prevent such threatened loss or injury. In such an emergency the Contractor shall act prudently and expeditiously to prevent any threatened loss or injury and shall immediately notify the College's Project Manager and the Campus Security Office of such actions.

8.5. ACCIDENTS

8.5.1. The Contractor shall provide at the site, and make available to all workers, medical supplies and equipment necessary to supply first aid service to all persons injured in connection with the Work.

8.5.2. Contractor must promptly report in writing to the College's Project Manager and the Campus Security Office all accidents arising out of, or in connection with, the performance of the Work, whether on or off the site, which caused death, personal injury or property damage, giving full details and statements of witnesses. In addition, if death or serious damages are caused, the accident shall be reported immediately by telephone or messenger. If any claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the College's Project Manager and the Campus Security Office, giving full details of the claim.

ARTICLE 9 – INSURANCE AND BONDS

9.1. INSURANCE

9.1.1. Unless otherwise indicated in the Contract Documents, Contractor shall secure, pay the premiums for, and keep in force until the expirations of this Agreement, and any renewal thereof, adequate insurance as provided below, such insurance to specifically include liability assumed by Contractor under this Agreement. The insurance must be evidenced by a certificate of insurance, and if requested by the College, the proposed awardees/ Contractor shall provide a copy of the insurance policies. The Contractor's insurance shall be primary.

a) Workmen's Compensation Insurance and Unemployment Insurance as required by the laws of the State of Maryland.

b) Commercial General Liability Insurance including all extensions:
$2,000,000 each occurrence;
$2,000,000 personal injury;
$2,000,000 products/completed operations;
$2,000,000 general aggregated

c) Property damage liability insurance with a limit of not less than $2,000,000 for each accident.

d) If automotive equipment is used in the operation, automobile bodily injury liability insurance with limits of not less than $1,000,000 for each person and $2,000,000 for each accident, and property damage liability insurance, with a limit of not less than $2,000,000 for each accident. A combined single limit policy is acceptable.

e) Builder's Risk Insurance, providing property damage coverage and theft replacement coverage for goods provided and services rendered during construction. For renovation projects, when custody of the building is turned over to the Contractor, the Builder's Risk policy must additionally include building replacement value.

All policies for liability protection, bodily injury or property damage must specifically name or its face, Montgomery College, the Board of Trustees, and their employees as "Additional Insured" as respects to operations under the agreement and provided, however, with respect to Contractor's liability for bodily injury or property damage, such insurance shall cover and not exclude Contractor's liability for injury to the property of the College, persons or property of employees, students, faculty members, agents, officers, trustees, invitees or guests of the College.

9.1.2. Prior to the College signing the Contract, the Contractor shall provide the College with evidence of payment for the above insurance coverage. Any agreement for an extension of time to the Contract shall also include evidence of payment for extending the above insurance coverage for that agreed upon period of time.

9.1.3. These coverages and limits are to be considered minimum requirements under this Agreement and shall in no way limit the liability or obligations of the Contractor. The insurance shall provide that policy coverage will not be canceled, altered or materially changed without sixty (60) calendar days' prior notice to the College by registered or certified mail. The insurance shall not be limited to claims made only while the policy is in effect.

9.1.4. The Contractor shall furnish the College with a certificate of insurance as evidence of the required coverage. The certificates of insurance must name the College as an additional insured.

9.1.5. In the event that the Contractor's insurance is terminated, the Contractor shall immediately obtain

other coverage and any lack of insurance shall be grounds for immediate termination of this Agreement.

9.1.6. For the purposes of this article, the word "licensed" shall be deemed to mean an insurance carrier either licensed or approved to do business in the State of Maryland.

9.2. PERFORMANCE, LABOR AND MATERIAL BONDS AND MAINTENANCE BOND

9.2.1. The College may require the Contractor to furnish bonds. The bonds furnished by the Contractor shall be issued by a surety licensed to conduct business in the State of Maryland. The surety shall be approved by the College. The bonds furnished shall comply in all respects with the requirements of Maryland's Little Miller Act and shall be in the form prescribed by the College.

9.2.2. Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

9.2.3. If at any time, the surety becomes insolvent, files for bankruptcy or for any reason whatsoever loses its right to do business in the State of Maryland, the Contractor shall, as soon as practicable but no later than within five calendar days, inform the College of this occurrence in writing.

9.2.4. If at any time, the surety becomes insolvent, files for bankruptcy or for any reason whatsoever loses its right to do business in the State of Maryland, the Contractor shall, within ten (10) calendar days after notice from the College to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety as may be satisfactory to the College.

ARTICLE 10 – CORRECTION OF WORK

10.1. CORRECTION OF WORK

10.1.1. Correction of Work Before Final Payment

10.1.1.1. The Contractor shall promptly remove from the premises all materials, equipment (whether incorporated in the Work or not) and Work rejected by the College’s Project Manager as failing to conform to the Contract Documents, and the Contractor shall promptly replace and re-execute all Work under its Contract in accordance with the Contract Documents and without expense to the College and shall bear the expense of making good all Work of other contractors destroyed or damaged by such removal or replacement.

10.1.1.2. If the Contractor fails to correct nonconforming Work and does not proceed with correction of such Work within a reasonable period fixed by written notice from College’s Project Manager, the College’s Project Manager may remove it and store the salvable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage within ten (10) calendar days after written notice, the College’s Project Manager may upon ten (10) additional calendar days written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the College’s Project Manager’s and Architect/Engineer's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contract sum shall be reduced by the deficiency. If payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the College.

10.1.2. Correction of Work after Substantial Completion of Work

10.1.2.1. If, within one year, or other time period established in the Contract Documents, after the date of Substantial Completion of the Work or designated portion thereof, any of the Work is found to not be in accordance with the Contract Documents, the Contractor, at its own expense shall correct it promptly after receipt of written notice from the College to do so. The Contractor shall pay for such tests and inspections made necessary by the faulty Work. The Contractor shall pay the costs incurred by the College for professional services and expenses, including but not limited to design professional and College's Project Manager fees, required as a result of Work found not in accordance with the Contract Documents, during the correction period. The correction period shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation shall survive Final Completion of the Work under the Contract and the Contract Closeout.

10.2. ACCEPTANCE OF NON-CONFORMING WORK

10.2.1. If, in the opinion of the College, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the Work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the College to be equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 11 – MISCELLANEOUS PROVISIONS

11.1. LEGAL OBLIGATIONS, RELATIONS AND RESPONSIBILITIES

11.1.1. Laws to be Observed

11.1.1.1. The Contractor shall keep fully informed of all Executive Orders, Federal, State, county, bi-county, regional and local laws, ordinances, rules and regulations and all orders and decrees of bodies of tribunals having any jurisdiction or authority, which in any matter affect those engaged or employed on the Work, or which in any way effect the conduct of the Work. It shall at all times observe and comply with all such laws, rules, ordinances, regulations, orders and decrees; it shall protect and indemnify the College and its Project Managers against any such claim or liability arising from or based on the violation of any law, ordinance, regulation, order, or decree, whether by itself or its employees, Subcontractors or suppliers at any tier. Whenever the Contract Documents require the Contractor to comply with provisions of Federal, State or local laws, regulations, ordinances or codes, the Contractor must comply whether such laws, regulations, ordinances or codes are expressly incorporated into the Contract or not.

11.1.1.2. The Contractor must comply with the provisions of the Workers' Compensation Act and Federal, State and local laws relating to hours of labor.

11.1.1.3. This Contract shall be construed and interpreted according to the laws of the State of Maryland, without regard to principles of conflicts of law.

11.1.1.4. If the Contractor observes that the Contract Documents are at variance with any applicable law, ordinance or regulation, it shall promptly notify the College's Project Manager, and any necessary change shall be adjusted as provided in the Contract for changes in the Work. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice, it shall bear all costs arising therefrom.

11.1.2. Regulations

11.1.2.1. Wherever any provision of any section of the Specifications conflicts with any agreements or regulations of any kind at any time in force among members of any Associations, Unions or Councils, which regulate or distinguish what work shall or shall not be included in the work of any

particular, the Contractor shall make all necessary arrangements to reconcile any such conflict without delay, damage or cost to the College and without recourse to the College.

11.1.2.2. In case the progress of the Work is affected by any undue delay in furnishing or installing any items of material or equipment required under the Contract because of a conflict involving any such agreement or regulation, the College's Project Manager and Architect/Engineer may require that other material or equipment of equal kind and quality be provided at no additional cost to the College.

11.2. INDEPENDENT CONTRACTOR

11.2.1. The Contractor shall perform the Contract as an independent contractor and shall not be considered as an agent of the College, nor shall any employee or agent of the Contractor be considered subagents of the College. Nothing in this Contract shall be construed as constituting a partnership, joint venture, or agency between the College and Contractor. Other than duties of the College's Project Manager based on authority granted to the College's Project Manager by the College, no acts performed or representations, whether oral or written, made by or with respect to third parties and the Contractor shall be binding on the College.

11.3. EQUAL OPPORTUNITY

11.3.1. During the performance of this Contract, and in accordance with applicable law, the Contractor shall not discriminate in any manner on the basis of age, sex, race, color, religious belief, national origin, creed, status as a qualified individual with a disability or handicap, pregnancy, marital status or status as a disabled veteran or veteran of the Vietnam era.

11.3.2. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated equally during employment without regard to their age, sex, race, color, religious belief, national origin, creed, status as a qualified individual with a disability or handicap, pregnancy, marital status or status as a disabled veteran or veteran of the Vietnam era. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.

11.3.3. During the performance of this contract, the Contractor agrees that it shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants shall receive consideration for employment without regard to sex, race, age, color, creed, national origin, religious belief, handicap, marital status or status as a disabled veteran or veteran of the Vietnam era. The Contractor further assures the College that, in accordance with the Immigration Reform and Control Act of 1986, it does not and will not discriminate against an individual with respect to hiring, or recruitment or referral for a fee, of the individual for employment or the discharging of the individual from employment because of such individual's national origin or in the case of a citizen or intending citizen, because of such individual's citizenship status.

11.3.4. The Contractor shall comply with all provisions of Executive Order 11246, as amended and of the rules, regulations and relevant orders of the Secretary of Labor.

11.3.5. The Contractor shall furnish all information and reports required by Executive Order 11246, as amended and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and shall permit access to the Contractor's books, records and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

11.3.6. In the event of the Contractor's noncompliance with the nondiscrimination clauses of the Contract or with any of such rules, regulations or orders, this contract may be canceled, terminated or suspended in whole or in part, or the College may take such other action as may be necessary to obtain compliance. If

such noncompliance appears continuing, the College may suspend all Contract payments until the noncompliance has ceased. Any delay in completion of the Contract as the result of the College taking action to obtain compliance with the nondiscrimination clauses of this Contract shall not preclude the imposition and collection of the liquidated damages for each day of delay in completion of the Work as provided for elsewhere in the Contract Documents. The Contractor may also be declared ineligible for further contracts with the College in accordance with procedures authorized in Executive Order 11246, as amended. The College's conceptual rights and remedies provided under this section are in addition to any other rights and remedies as provided in Executive Order 11246, as amended or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law or under this Contract.

11.3.7. Subcontractors shall not be approved by the College without first agreeing to the above terms and conditions, and the Contractor shall include the provisions of subsections (1) through (7) of this section in every subcontract or purchase order unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246, as amended, so that such provisions shall be binding upon each Subcontractor or vendor. The Contractor shall take such action with respect to any Subcontractor or purchase order as the College may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the College, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

11.4. COMPLIANCE WITH THE IMMIGRATION REFORM AND CONTROL ACT OF 1986

11.4.1. The Contractor warrants that both the Contractor and/or any subcontractor of the Contractor do not and shall not hire, recruit or refer for a fee, for employment under this Agreement or any subcontract, an alien knowing the alien is an unauthorized alien and hire any individual without complying with the requirements of the Immigration Reform and Control Act of 1986 (hereinafter referred to as "IRCA"), including but not limited to any verification and record keeping requirements. The Contractor agrees to indemnify and save the College, its employees and/or trustees harmless from any loss, costs, damages or other expenses suffered or incurred by the College, its employees and/or trustees by reason of the Contractor's or any subcontractor of the Contractor's noncompliance with "IRCA." The Contractor agrees to defend the College, its employees and/or trustees in any proceeding, action or suit brought against the College, including but not limited to administrative and judicial proceedings, arising out of or alleging noncompliance of the Contractor with "IRCA." The Contractor recognizes that it is the Contractor's responsibility to ensure that all certifications and verifications as required by law are obtained and maintained for the applicable time period.

11.5. ASSURANCE OF NONCONVICTION OF BRIBERY

11.5.1. The Contractor hereby declares and affirms that, to its best knowledge, none of its officers, directors or partners and none of its employees directly involved in obtaining contracts has been convicted of bribery, attempted bribery or conspiracy to bribe under the laws of any state or the Federal Government.

11.6. CONFLICT OF INTEREST

11.6.1. No employee of the College or of the State of Maryland, or any department, commission, agency or branch thereof whose duties as such employee include matters relating to or affecting the subject matter of this Agreement shall, until such time as the Contractor receives final payment, become or be an employee of the party or parties hereby contracting with the College, the State of Maryland, or any department, commission, agency or branch thereof.

11.7. ASSIGNMENT AND SUBCONTRACTING

11.7.1. Neither the College nor the Contractor shall sell, transfer, assign or otherwise dispose of this Agreement or any portion thereof, or its right, title or interest therein, or its obligations there under, without the written consent of the other. A change in membership of the Contractor’s firm of one or more officers

shall not constitute an assignment.

11.7.2. The Contractor shall not make any contracts for professional services with any other party for furnishing any of the work or services to be performed under this Agreement without the written approval of the College; however, this provision shall not be taken as requiring the approval of the contract of employment between the Contractor and its personnel assigned for the purposes of performing this Agreement.

11.8. CONTINGENT FEES

11.8.1. The Contractor hereby declares and affirms that neither it nor any of its representatives has employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the Contractor, to solicit or secure this Agreement, and that it has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or any other consideration contingent on the making of this Agreement.

11.9. MARYLAND PUBLIC INFORMATION ACT

11.9.1. The College is subject to the Maryland Public Information Act, Title 4 of the General Provisions Article of the Annotated Code of Maryland. Contractor agrees that it will provide any justification as to why any material, in whole or in part, is deemed to be confidential, proprietary information or secrets and provide any justification of why such materials should not be disclosed pursuant to the Maryland Public Information Act.

11.10. TESTING AND INSPECTION

11.10.1. The College may retain, or may require the Contractor to retain, the services of testing/inspection laboratories/firms to perform the tests and make the required inspections and reports during the course of the Work as specified in the various sections of the Specifications or as required by the College in case of questions as to the strength or suitability of materials. However, for the purpose of preparing and testing design concrete mixes, the Contractor will retain the services of a testing laboratory which shall be other than that retained by the College. The Contractor shall also be responsible for all tests as indicated in the Specifications.

11.10.2. Testing/inspection laboratories/firms shall be responsible for conducting and interpreting the tests, shall state in each report whether or not the specimens tested conform to all requirements of the Contract Documents and shall specifically note deviations, if any, from said requirements. All testing/inspection laboratories/firms shall be subject to the College's approval.

11.10.3. The cost of testing services required solely for the convenience of the Contractor in its scheduling and performance of the Work, and the cost of testing services related to remedial operations performed to correct deficiencies in the Work shall be borne by the Contractor.

11.10.4. The Contractor shall furnish to the College’s Project Manager samples of all materials and component parts of the Work required as test specimens in connection with the specified tests, and shall furnish labor and facilities at the site as necessary in connection with testing and inspection services whether such services are performed at the expense of the College or the Contractor.

11.10.5. The nature and scope of testing services performed by an agency retained by the Contractor shall be in accordance with requirements of governing authorities having jurisdiction over the Work and as otherwise specified, and shall be consistent with reasonable standards of engineering practice.

11.10.6. If, in the performance of any testing, control, balancing, adjusting or similar activities to be performed by the Contractor or an agent of the Contractor, it is the opinion of the College’s Project Manager that the Contractor or said agent has failed to substantiate its ability to perform such work, the Contractor shall, at its expense, retain the services of a testing laboratory or service organization which is satisfactory to the College’s Project Manager for the performance of such work.

11.11. NO WAIVER OF RIGHTS – COLLEGE'S REMEDIES CUMULATIVE – COLLEGE'S DAMAGES

11.11.1. The College shall not be precluded or estopped by any measurement, estimate, change order, contract modification, certificate of payment, or payment from showing the true amount and character of the Work furnished by the Contractor, or from showing that any measurement, estimate, change order, contract modification, certificate of payment, or payment is untrue or was incorrectly made, or from showing that the Work does not in fact conform to the Contract Documents. The College may recover from the Contractor or its sureties, or both, such damages, loss or additional expense incurred as a result of any such error or measurement, estimate, change order, contract modification, certificate of payment, or payment as a result of such failure to conform to the Contract Documents. The College's right in this respect shall not be waived or barred by any inspection, acceptance or approval of the Work, or by payment therefore, or by granting an extension of time, or by taking possession, or by execution of a change order based on the erroneous measurement, estimate, or change order, contract modification, certificate of payment or payment.

11.11.2. The activities of the College's Project Manager, Architect/Engineer and the College respecting this Contract, including inspection of the Work, review of submittals, monitoring of progress, and so forth, are for the benefit of the College only and are not for the benefit of the Contractor. The College's failure to bring to the attention of the Contractor deficiencies in the Work or in the Contractor's performance will not constitute a waiver or excuse of the Contractor's failure to comply strictly with contract requirements.

11.11.3. The waiver by the College of any breach of contract by the Contractor shall not operate as a waiver of any other or subsequent breach.

11.11.4. The rights and remedies of the College and the obligations of the Contractor under various provisions of the Contract Documents and under provisions of the law are cumulative and not exclusive.

11.11.5. For any claim or cause of action accruing to the College as a result of or arising out of this Contract, the College may collect damages of any kind, including consequential damages, or damages for purely economic loss.

11.12 REGISTRATION FOR CORPORATIONS NOT INCORPORATED IN THE STATE OF MARYLAND

Pursuant to 7-201 et seq. of the Corporation and Associations Article of the Annotated Code of Maryland, corporations not incorporated in the State of Maryland shall be registered with the State Department of Assessments and Taxation, 301 West Preston Street, Baltimore, Maryland 21201, before doing any interstate or foreign business in this State. By signing this agreement, the Contractor certifies that it has qualified with the Department of Assessments and Taxation.

ARTICLE 12 – TERMINATION OF THE CONTRACT

12.1. TERMINATION FOR DEFAULT

12.1.1. The performance of the Work or services under this Contract may be terminated by the College, in whole or in part, from time to time, effective upon receipt of notice, whenever the Contractor shall default in the performance of this Agreement and fails to make progress in the prosecution of the contract work or endangers such performance and shall fail to cure such default within ten (10) calendar days period after receipt of written notification from the College specifying the default.

12.1.2. The College may terminate the Contract if the Contractor;

12.1.2.1. persistently or repeatedly refuses or fails to supply enough properly skilled Workers or materials;

12.1.2.2. fails to make payment to Subcontractors for materials or labor in accordance with their

respective agreements between the Contractor and the Subcontractors;

12.1.2.3. persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction;

12.1.2.4. refuses or fails to prosecute the Work, or any separable part thereof with such diligence as shall ensure its completion within the time specified in the Contract or in the extension thereof;

12.1.2.5. fails to complete the Work within the time allotted by the Contract; or

12.1.2.6. is in breach of any material obligation of the Contract, including a breach which may occur after Substantial Completion.

12.1.3. If any of the above reasons exist, the College may without prejudice to any other rights or remedies of the College and after giving the Contractor and the Contractor's surety, if any, seven days written notice, terminate the employment of the Contractor and may, subject to any rights of the surety:

12.1.3.1. take possession of the site and all materials, equipment, tools, and construction equipment and machinery owned by the Contractor; and

12.1.3.2. finish the Work by whatever reasonable means the College may deem is in its interests.

12.1.4. When the College terminates the Contract for one of the reasons stated herein, the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Sum exceeds the cost to finish the Work, such excess shall be applied to the Contractor’s unreimbursed costs, if any, accrued from the last payment prior to termination to time of termination. This amount shall become due to the Contractor. Any unreimbursed costs exceeding the difference of unpaid balance of the Contract Sum and the cost to finish the Work shall be lost to the Contractor. If the cost to finish the Work exceeds the Contract Sum, the Contractor shall pay the difference to the College. The amount to be paid to the Contractor or College, as the case may be, shall survive termination of the Contract.

12.2. TERMINATION FOR CONVENIENCE

12.2.1. The College may, at any time, terminate the Contract in whole or in part for the College's convenience and without cause.

12.2.2. Upon receipt of written notice from the College of such termination for the College's convenience, the Contractor shall (1) cease operations as directed by the College in the notice; (2) take actions necessary, or that the College may direct, for the protection and preservation of the Work; and (3) except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

12.2.3. In the case of such termination for the College's convenience, the Contractor shall be entitled to receive payment from the College for all expenses incurred by it for satisfactory work, including reasonable termination expenses. Upon satisfactory proof that the Contractor would have earned a profit for Work performed prior to the date of termination, the Contractor shall be paid a reasonable amount for profit not to exceed 10% of the Contractor’s costs incurred. Under no circumstances shall the Contractor be entitled to payment for anticipated but unearned profit, overhead, and damages. In no event shall the Contractor's cost of the Work and profit, if any, to be reimbursed exceed the Contract Sum as adjusted by approved change orders.

END OF GENERAL CONDITIONS

SUPPLEMENTARY CONDITIONS OF THE CONTRACT

PART 1 - COMPLEX STRUCTURES

1.1 Paragraph 3.1.2 of Section 007200, General Conditions of the Contract, Montgomery County Complex Structures process does not apply to this project.

PART 2 - PROJECT PROCEDURES

2.1 The Contractor shall coordinate with the College regarding site access.

2.2 The Contractor shall share site access and project site with other contractors performing work concurrently.

2.3 The Contractor shall accommodate mid-terms and final exams in the schedule and refrain from any noisy or disruptive work during this time. The College shall determine time frame for mid-term and final examinations.

2.4 Contractor to provide porta-potties for use by construction crew.

2.5 Contractor to adhere to noise ordinance of Takoma Park City.

2.6 Contractor is allowed to park inside of the East Garage while construction is taking place.

2.7 Contractor is responsible for the safety and security of the project site.

2.8 Contractor to provide at least five (5) days' notice to the College's Project Manager prior to turning off any utilities.

2.9 East Garage shall remain **OPEN** during construction.

PART 3 – MINORITY PARTICIPATION INCLUDED IN THE APPLICATION FOR PAYMENT

3.1 Article 7.2.1 Application for Payment of Section 007200, General Conditions of the Contract, Contractor shall submit minority business documentation with each pay application monthly indicating amounts paid to each minority sub-contractor.

END OF SUPPLEMENTARY CONDITIONS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Project information
2. Work covered by Contract Documents
3. Phased construction
4. Coordination with occupants
5. Work restrictions
6. Specification and drawing conventions
7. Contractor Qualifications

1.03 PROJECT INFORMATION

A. Project Identification: Montgomery College Takoma Park Campus – Pavilion Four Fire Alarm Upgrade

1. Project Location: Takoma Park, Maryland

B. Owner: Montgomery College

C. Engineer: Burdette, Koehler, Murphy & Associates, Inc., 6300 Blair Hill Road, Suite 400, Baltimore, MD 21209

1.04 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Mass Notification- System Concept:

a. Montgomery College is installing a mass notification system (MNS) at its Takoma Park Campus.

b. The primary purpose of the College's MNS is to issue live or recorded messages instructing occupants of protected areas on how best to reduce their risk of personal harm in potentially life-threatening situations. The MNS will provide real- time information and instructions to student body, faculty, and staff in buildings or on the campus proper using intelligible voice communications in combination with visible signals, and message boards. The MNS takes advantage of the functions and features of a voice evacuation fire alarm system. A fire alarm system is proven technology and is made reliable through code mandates for supervised system circuitry and power back up measures to maintain the system

operational under utility failures. While the fire alarm system is designed to manage building evacuations, the MNS deals with different threats and building evacuation may not always be the best solution in the face of coordinated terrorist attacks, sweeping risks from chemical spills, or all-encompassing dangers of natural disasters.

2. System Implementation:

   a. To implement features of the MNS, a College Standard voice evacuation fire alarm system is a prerequisite. Key features of the College's fire alarm system critical to the MNS include the following:

      1) Voice evacuation system
      2) Addressable micro-processor based fire alarm control panel
      3) Addressable initiation and alarm notification appliances
      4) Combination of fire alarm terminal cabinet and fire alarm extender panel (FATC-FAEP)
      5) 24 hour supervisory and 15 minutes full alarm load battery back-up capability

   b. Components required to supplement the fire alarm system for MNS include the following:

      1) Fire alarm notification appliance (strobe) bezel with a bezel showing the word ‘ALERT’.
      2) Provisions for message boards (message boards are not in the contract). There are no message boards n the East Garage.
      3) MNS A/V devices located on exterior walls adjacent to egress doors.

   c. Fire Alarm Control Panel: The fire alarm control panel will be connected to the campus' fiber optic loop in East Garage. This connection will require coordination with the College's IT Group.
   d. Shared Visual Appliance: The visual appliance will be shared between the fire alarm system and the MNS system. The FACP will activate the shared strobe for a building evacuation due to fire or for MNS emergency announcements.
   e. System Speakers: The fire alarm system provisions for speakers in the facility are placed to meet code requirements for building evacuation. These measures are sufficient for the MNS and additional speakers are then not required for implementation of the MNS in facilities.

3. Work Covered under this Contract:

   a. Provide all work required for a complete and operational MNS system under this project. All work is part of this contract unless specifically noted as being furnished and installed by the College.

b. Provide replacement fire alarm system in East Garage inclusive of exterior A/V devices shown on the drawings.
c. Existing Security Office located in ST First Floor is the location for the existing central operation for the MNS.
d. P2 is the backup location for the central operation of the MNS.
e. Interconnect new fire alarm control panel (FACP) in East Garage to the College's IT fiber optic network via fiber modems. Fiber optic cabling between facilities on Takoma Park Campus exists. The College will provide fiber optic cable to connect fiber modems to the College fiber network. Fiber optic cable will be provided by the College. Final connection of the fiber cable to the fiber modems is the responsibility of the Contractor. The modems are part of the fire alarm system work to be provided under this contract.
f. Provide interconnection cable, connections, programming, etc. to interface the FACP to the IT rack equipment in East Garage.
g. Upgrade electrical service equipment serving East Garage. Coordinate power outages, and disconnection and reconnection of existing service conductors with PEPCO.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.05 PHASED CONSTRUCTION

A. The Work shall be conducted in phases. Coordinate with the Supplemental Conditions.

B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates for all phases of the Work.

1.06 COORDINATION WITH OCCUPANTS

A. Owner Occupancy: Owner may or may not fully occupy site and existing buildings during the entire construction period. This will be dependent on COVID-19 restrictions which may be in place during the construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Contractor shall submit a COVID-19 work plan to the College for their review and approval prior to commencement of demolition and construction.

B. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.07 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1.08 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division-01 General Requirements: Requirements of Sections in Division-01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.09 CONTRACTOR QUALIFICATIONS

A. In addition to qualifications identified in Bidding Requirements, the contractor shall meet the following qualifications:

1. Job supervisor must have current Montgomery County Fire Alarm and journeyman licenses.
2. At the request of the College, provide a minimum of 3 projects valued at more than $500,000 related to life safety and fire alarm system work. Include project name, end user, and contact information.
3. Demonstrate a minimum of 10 years' experience in fire alarm system work.

PART 2 - PRODUCTS

Not Applicable

PART 3 – EXECUTION

Not Applicable

END OF SECTION 011000

SECTION 04 2000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Mortar and grout.

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

1.4 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

1. Mortar Test (Property Specification): For each mix required, according to ASTM C 109/C 109M for compressive strength.
2. Grout Test (Compressive Strength): For each mix required, according to ASTM C 1019.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.6 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of the following:

1. Masonry units.

    a. Include material test reports substantiating compliance with requirements.

2. Cementitious materials. Include brand, type, and name of manufacturer.
3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
4. Grout mixes. Include description of type and proportions of ingredients.

5. Joint reinforcement.

1.7 QUALITY ASSURANCE

A. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination."

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 PROJECT CONDITIONS

A. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect sills, ledges, and projections from mortar droppings.
2. Protect surfaces of door frames, as well as similar products with painted and integral finishes, from mortar droppings.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

2.2 CONCRETE MASONRY UNITS

A. Regional Materials: CMUs shall be manufactured within 500 miles of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, bonding, and other special conditions.
2. Provide square-edged units for outside corners unless otherwise indicated.

C. CMUs: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
2. Density Classification: Normal weight.

2.3 MASONRY LINTELS

A. General: Provide the following:

1. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.4 MORTAR AND GROUT MATERIALS

A. Regional Materials: Aggregate for mortar and grout**,** cement, and lime shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

C. Hydrated Lime: ASTM C 207, Type S.

D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

E. Masonry Cement: ASTM C 91.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Capital Materials Corporation; Flamingo Color Masonry Cement.
    b. Lafarge North America Inc.; Lafarge Masonry Cement.

F. Mortar Cement: ASTM C 1329.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Lafarge North America Inc.; Lafarge Mortar Cement.

G. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

H. Aggregate for Grout: ASTM C 404.

I. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Grace Construction Products, W. R. Grace & Co. - Conn.; Morset.
    b. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.

J. Water: Potable.

2.5 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use portland cement-lime masonry cement or mortar unless otherwise indicated.
3. For exterior masonry, use portland cement-lime masonry cement or mortar.
4. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

1. For interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.

D. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
2. Verify that foundations are within tolerances specified.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

C. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

H. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Fasten partition top anchors to structure above and build into top of partition. Space anchors 48 inches o.c. unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs as follows:

1. With webs fully bedded in mortar and with head joints of depth equal to bed joints.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.6 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Inspections: Level 1 special inspections according to the "International Building Code."

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

G. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for compressive strength.

H. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.7 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.8 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Excess Masonry Waste: Remove masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 2000

SECTION 07 9200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Silicone joint sealants.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project Site.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

C. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.

C. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L or less.
2. Sealants and sealant Primers for Nonporous Substrates: 250 g/L. or less.
3. Sealants and sealant Primers for Porous Substrates: 775 g/L. or less.
4. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
5. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

2.3 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

B. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

C. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

1. Masonry.

D. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

1. Metal.

E. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

F. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
4. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
5. Use masking tape to protect surfaces adjacent to recessed tooled joints.
6. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.
7. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
8. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

   a. Perimeter joints between materials listed above and frames of doors.
   b. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, Single component, nonsag, neutral curing, Class 100/50.

   a. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 07 9200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior standard steel doors and frames.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.40 deg Btu/F x h x sq. ft. (2.27 W/K x sq. m) when tested in accordance with ASTM C1363 or ASTM E1423.

2.2 STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule on Drawings.
b. Thickness: 1-3/4 inches.

c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 (ZF120) coating.
d. Edge Construction: Model 2, Seamless.
e. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
f. Bottom Edges: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
g. Core: Manufacturer's standard.

2. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 (ZF120) coating.
b. Construction: Full profile welded.

2.3 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor.
3. Post-installed Expansion Anchor: Minimum 3/8-inch-diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.4 MATERIALS

A. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

B. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.

C. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

2.5 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

B. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule on Drawings, and templates.

1. Reinforce doors and frames to receive non-templated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

2.6 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
2. Floor Anchors: Secure with post-installed expansion anchors.

a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.

3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.

4. In-Place Concrete or Masonry Construction: Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
5. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

B. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Owner may engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

C. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 REPAIR

A. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint in accordance with manufacturer's written instructions.

B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 1113

SECTION 087111 - DOOR HARDWARE (DESCRIPTIVE SPECIFICATION)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanical door hardware for the following:

a. Swinging doors.

2. Electrified door hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For electrified door hardware.

1. Include diagrams for power, signal, and control wiring.
2. Include details of interface of electrified door hardware and building safety and security systems.

C. Door hardware schedule.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.

1. Scheduling Responsibility: Preparation of door hardware and keying schedule.
2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:

a. Electromagnetic Locks: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 HARDWARE ITEMS

A. Continuous, Gear-Type Hinges:

1. Extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.
2. Acceptable Manufacturers: PBB, Inc., Select Products Limited, or Zero International.
3. Grade: 1-300.
4. Mounting: Full surface, with removable continuous caps over fasteners.
5. Electric Feature: Electric through wires and monitor

B. Cylinders:

1. Acceptable Manufacturers: Corbin Russwin Architectural Hardware.
2. Provide cylinders for locksets, locking trim for exit devices, exit device dogging, lockable mullions, and any other lock cylinders required.
3. Cylinders shall be 6-Pin, interchangeable core type with cores removable by special control key.
4. Equip all cylinders with brass color-coded, temporary cores for use during construction and for testing the hardware; plastic cores are prohibited.
5. Include all necessary extensions, cams, tail pieces and hardened collars required for a complete installation.

C. Locks and Latches:

1. Acceptable Manufacturers: Corbin Russwin Architectural Hardware or Yale Security, Inc.
2. Mortise locks and latches shall be equal to Corbin Russwin ML2000 Series with NSA trim.

a. All internal working parts shall be brass, bronze, steel or stainless steel. For each lock and latchset, provide strike box and square corner ASA strike with curved lip of sufficient length to protect frame; at pairs of doors furnish flat lip strikes.
b. Furnish knurling to lever on corridor side of door to all doors leading to hazardous areas (e.g. Mechanical Rooms, Electrical Rooms, Elevator Machine Rooms, etc.).

3. Furnish keyed devices with cylinders keyed to building system.
4. Electrical Modifications:
   a. Field-connect electrified locks to associated power transfer units; coordinate electrical connection and installation with Divisions 26 and 28.

D. Exit Devices and Exit Device Accessories: Von Duprin, Inc.

1. Where lever handle functions are required on exit devices, they shall match the design and construction of lever handles specified for mortise locks.
   a. At mortise exit devices, provide strike box and square corner, stainless steel ASA strike with curved lips of sufficient length to protect frame; at pairs of doors furnish flat lip strikes.
2. Furnish with provision for concealed mounting, through bolts will not be acceptable.
3. Furnish keyed devices with cylinders keyed to building system.
4. Provide UL-labeled fire-exit hardware at fire-rated openings.
5. Electrical Modifications:
   a. Exit devices specified to be electrified shall be factory-modified to Electrically Lock (FAIL SAFE) or Electrically Unlock (FAIL SECURE), as indicated, upon receipt of a 24V signal and will remain in this mode until signal is interrupted.
   b. Exit devices indicated to have electric latch retraction shall be modified to electrically unlatch (dog down) upon receipt of a 24V signal and will remain unlatched until signal is interrupted.
   c. Field-connect electrified exit devices to associated power transfer units. Coordinate electrical connection and installation with Divisions 26 and 28.

E. Overhead Stops and Holders

1. Overhead Stops and Holders: BHMA A156.8.
2. Overhead Surface-Mounted, Nonfriction Slide Stops: Type 5; Grade 1; with nonfrictional element held under adjustable pressure and shock absorber; for single-acting doors opening 110 degrees.
3. Acceptable Manufacturers: Architectural Builders Hardware, Glynn-Johnson, Rixson or Rockwood Manufacturing Company.
4. Furnish concealed overhead stops equal to Glynn-Johnson 410S.

F. Door Gasketing

1. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
2. Maximum Air Leakage: When tested in accordance with ASTM E283 with tested pressure differential of 0.3-inch wg , as follows:
   a. Gasketing on Single Doors: 0.3 cfm/sq. ft. of door opening.
3. Rigid, Housed, Perimeter Gasketing: Sponge neoprene gasket material held in place by housing; fastened to frame stop with screws.
   a. Housing Material: Aluminum.
4. Door Sweeps: Neoprene gasket material held in place by flat housing or flange; surface mounted to face of door with screws.

a. Housing or Flange Material: Aluminum.

G. Thresholds

1. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

2. Acceptable Manufacturers: National Guard Products, Inc., Pemko Manufacturing Company, Reese Enterprises, Inc. or Zero International

3. Saddle Thresholds:

a. Type: Thermal break and fluted top.
b. Base Metal: Aluminum.

2.3 AUXILIARY ELECTRIFIED DOOR HARDWARE

A. Auxiliary Electrified Door Hardware:

B. Boxed Power Supplies: Modular unit in NEMA ICS 6, Type 4 enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; listed and labeled for use with fire-alarm systems.

C. Door Position Switches: Magnetically operated reed switch designed for concealed mounting.

D. Door and Frame Transfer Devices: Steel housing for mortise in hinge stile of door, with flexible tube for wiring bundle; accommodating doors that swing open to 120 degrees.

2.4 FINISHES

A. Provide finishes complying with BHMA A156.18 as follows:

1. Steel Base Metal: Brushed stainless steel 630.
2. Aluminum Base Metal: Clear anodized 628 or mill finish.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

C. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Furnish permanent cores to Owner for installation.

D. Boxed Power Supplies: Locate power supplies in equipment room. Coordinate location with other equipment in room.

1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of non-curing sealant recommended for application by manufacturer.

F. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

1. Do not notch perimeter gasketing to install other surface-applied hardware.

3.2 ADJUSTING

A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.3 DOOR HARDWARE SCHEDULE

A. Hardware Set A:

1. Continuous geared hinge.
2. Electrified Lockset: Rim Exit Device with entry function.
3. Overhead stop.
4. Threshold.
5. Weatherstripping.
6. Door sweep.

B. Hardware Set B:

1. Continuous geared hinge.
2. Electrified Lockset: Rim Exit Device with entry function.
3. Overhead stop.
4. Threshold.
5. Weatherstripping.
6. Door sweep.

C. Hardware Set C:

1. Continuous geared hinge.
2. Rim Exit Device without exterior trim.
3. Overhead stop.
4. Threshold.
5. Weatherstripping.
6. Door sweep.

D. Hardware Set D:

1. Continuous geared hinge: Each leaf.
2. Lockset – Entry function: Active leaf.
3. Dummy Trim: Inactive leaf.
4. Manual Surface Flush Bolts: Inactive leaf.
5. Overhead stop: Each leaf.
6. Threshold.
7. Weatherstripping.P
8. Door sweeps.

END OF SECTION 087111

SECTION 09 9123 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on interior substrates.

1. Concrete masonry units (CMUs).
2. Steel and iron.
3. Concrete traffic surfaces.

1.3 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
2. Indicate VOC content.

B. Sustainable Design Submittals:

1. Product Data: For paints and coatings, indicating VOC content.
2. Laboratory Test Reports: For paints and coatings, indicating compliance with requirements for low-emitting materials.

C. Samples for Initial Selection: For each type of topcoat product.

D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.

E. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:

1. Benjamin Moore & Co.
2. PPG Architectural Finishes, Inc.
3. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:

1. Flat Paints and Coatings: 50 g/L.
2. Non-flat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Under-coaters: 100 g/L.
5. Rust-Preventive Coatings: 100 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
7. Pretreatment Wash Primers: 420 g/L.

D. Colors: As selected by Applicator and approved by Owner and Architect to match adjacent construction.

1. Owner to provide final paint color approval after mock-up.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Masonry (Clay and CMUs): 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie

coat as required to produce paint systems indicated.

D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. New or existing CMU substrates and previously painted concrete surfaces in work area, except as directed by Owner:

1. Institutional Low-Odor/VOC Latex System MPI INT 4.2E:

a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3), MPI #145.

1) For CMU wall surfaces and previously painted concrete surfaces.

B. Steel Substrates:

1. Institutional Low-Odor/VOC Latex System MPI INT 5.1S:

a. Prime Coat: Primer, rust inhibitive, water based MPI #107.
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5), MPI #147.

C. Concrete Traffic Surfaces:

1. Floor Enamel, Alkyd, Gloss:

a. Prime Coat: As identified in writing by top coat manufacturer to suit existing concrete slab.
b. Intermediate and Top Coat: Alkyd floor enamel, Gloss.

END OF SECTION 09 9123

SECTION 230100 – BASIC HVAC REQUIREMENTS

PART 1 - GENERAL

1.01 CONTRACT DOCUMENTS

A. Unless otherwise modified, provisions of General Conditions, Supplementary Conditions and Division-01 govern work under the Mechanical Divisions.

B. Contract drawings for mechanical work are diagrammatic, intended to convey scope and general arrangement. Contractor shall review and coordinate routing of new work to clear existing piping, duct, electrical, structure, etc. at no cost to the Owner. All dimensions of existing conditions shall be considered approximate (for information only). All dimensions shall be verified prior to construction.

C. Contract Document Interpretation/Discrepancies:

1. Should the Contractor discover any discrepancies or omissions on the drawings or in the specifications, he shall notify the Architect/Engineer (A/E) of such conditions prior to the bid date. Otherwise, it will be understood that the drawings and specifications are clear as to what is intended and shall be as interpreted by the A/E.
2. In addition, should any contradiction, ambiguity, inconsistency, discrepancy or conflict appear in or between any of the Contract Documents, the Contractor, shall, before proceeding with the work in question, notify the A/E and request an interpretation. In no case shall he proceed with the affected work until advised by the A/E.
3. If the Contractor fails to make a request for interpretation of discrepancies or conflicts in the drawings or specifications, no excuse will be accepted for failure to carry out the work in a satisfactory manner, as interpreted by the A/E. In all cases, the Contractor will be deemed to have estimated the most stringent materials and methods (i.e. the highest quality materials and most expensive manner of completing the work) unless he has requested and obtained written authorization as to which methods or materials will be required.
4. Each and every trade or subcontractor will be deemed to have familiarized himself with all drawings of this project, including Site/Civil, Architectural, Structural, Mechanical, Electrical, Information Technology, etc. so as to avoid coordination errors, omissions, and misinterpretations. No additional compensation will be authorized for alleged errors, omissions, and misinterpretation, whether they are a result of failure to observe these requirements or not.

D. The complete set of Architectural, Structural, Civil, Mechanical, and Electrical drawings and specifications apply to this work.

1.02 SCOPE

A. The work in Division-23 includes furnishing and installing the mechanical systems complete and ready for satisfactory service.

B. Requirements specified govern work in all sections of Division-23.

1.03 REFERENCES

A. References to standards, codes, catalogs and recommendations are latest edition in effect on date of invitation to bid.

B. Refer to applicable contract drawings, specifications and addenda pertaining to other divisions for conditions affecting work.

C. Refer to Division-01 for description of alternates.

D. Refer to Division-01 for description of allowance items.

E. Refer to Division-01 for description of base bid items.

F. Refer to Division-01 for description of demolition items.

1.04 DEFINITIONS

A. Following are definitions of terms and expressions used in this Division:

1. "Approve" - to permit use of material, equipment or methods conditional upon compliance with contract document requirements.
2. "Concealed" - hidden from normal sight; includes work in crawl spaces, above ceilings, and in building shafts.
3. "Directed" - directed by Engineer.
4. "Ductwork" - includes ducts, fittings, housings, dampers, supports and accessories comprising a system.
5. "Equal, equivalent" - possessing the same performance qualities and characteristics and fulfilling the same utilitarian function.
6. "Exposed" - not concealed.
7. "Indicated" - indicated in Contract Documents.
8. "Piping" - includes pipe, fittings, valves, supports and accessories comprising a system.
9. "Provide" - furnish and install.
10. "Removable" - detachable from the structure or system without physical alteration of materials or equipment or disturbance to other construction.
11. "Review" - limited observation or checking to ascertain general conformance with design concepts and general compliance with contract document requirements. Such action does not constitute a waiver or alteration of the contract requirements. Verification of quantities and dimensions shall be the responsibility of the Contractor.
12. “Appurtenances” - a device or assembly installed in the referenced system which performs some useful referenced function in the operation, maintenance, servicing, economy or safety of the system. Some examples include, but are not limited to aerators, anchors, supports, gauges, backflow preventors, expansion tanks, filters, flow controls, heat exchangers, interceptors, meters, pressure reducing valves, relief valves, dampers, separators and similar devices.
13. “Record Documents” - drawings, plans and specifications that indicate the nature and location of work reported by Contractors, but not verified by Consultant. Record documents cannot be considered reliable; as they are based on information reported by the Contractor only and is not verified by the Architect or Engineer (A/E).

1.05 RIGGING REQUIREMENTS

A. Prior to bidding, the Contractor shall verify that all equipment can be physically rigged to the proposed location without disturbance or dismantling of any existing or new physical obstacles. Should the rigging of any new equipment appear to be an issue, the Contractor shall inform the Architect or Engineer (A/E) seven (7) days prior to the bid date that the rigging of the new equipment may present a problem. Otherwise, the Contractor shall, in accordance with the manufacturer's approval and without voiding warranties and/or certifications, have the equipment "broken down" into sections as required to install the equipment in its proposed location without disturbance or dismantling of any existing or new physical obstacles.

B. Failure to inform the Architect or Engineer (A/E) seven (7) days prior to the bid of any rigging problems will result in the Contractor accepting full responsibility for all modifications to the equipment or the physical obstacles required to install the equipment in its proposed location without additional cost to the Owner.

1.06 CONTRACTOR'S INSTALLATION DRAWINGS

A. Prior to fabrication and installation, submit shop drawings (min. scale - 1/4" = 1' - 0") illustrating all ductwork, HVAC piping, plumbing piping, lighting fixtures, cable tray, conduit, expansion loops, supports, alignment guides and fire protection coordinated with each other and with the structure. Installation drawings shall be reviewed by Owner's representative prior to fabrication and installation of any new work and prior to the ordering of any mechanical equipment.

B. Should the Contractor not provide the coordinated installation drawings required above, the following shall apply:

1. The Contractor shall accept full and absolute responsibility for the coordination of all project materials and equipment to be installed as indicated on the contract documents.
2. Proposed change orders and/or time extensions will not be accepted for any additional work that results from coordination related changes.
3. A credit shall be issued to the Owner for the value of the coordinated installation drawings; the value of the credit to the Owner shall be as determined by the A/E.

C. Computer (CADD) files of mechanical drawings (HVAC, etc.) will not be made available to the Contractor for use in the preparation of coordinated drawings, shop drawings or any other use.

1.07 MATERIAL, EQUIPMENT AND SUBSTITUTION REQUIREMENTS

A. Use products of one manufacturer where two or more items of same kind of equipment are required.

B. Materials and equipment shall have a record of two (2) years successful field use.

C. Where a specific manufacturer is listed on the drawings, that manufacturer shall be considered the basis of design for that particular item of equipment. Only the basis of design manufacturer has been verified to meet the project requirements (i.e. dimensions, weights, service clearances, electrical requirements, etc.).

D. Where the drawings and/or specifications indicate more than one manufacturer for a particular item of equipment, only those listed may submit products and services to be included in the work; manufacturers other than those listed will not be

acceptable. Should the contractor choose to use one of the specified manufacturers other than the basis of design, it shall be the responsibility of the contractor to verify that the equipment meets all project requirements including, but not limited to, verification of all dimensions, weights, service clearances, electrical requirements, etc. All changes incurred shall be the responsibility of the contractor and shall be provided at no additional cost to the owner.

E. Substitutions must be submitted for consideration seven (7) days prior to the original bid date. Consideration of substitutions shall be at the sole discretion of the Engineer. Substitution submittals shall include all information required in the “Submittals” paragraph of this specification section, as well as all other requirements indicated through the Division-23 specifications. Substitutions will not mitigate, in any way, the Contractor's responsibility in complying with the coordination, contract requirements or design intent. Any additional electrical, structural or special requirements, etc. shall be the responsibility of the Contractor. Also, any additional cost incurred as a result of substitution shall be the responsibility of the Contractor.

F. Nameplate: For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

G. Where items of equipment are indicated as Base Bid on the bid form include in the Bid price the cost of providing the equipment upon which the specification is based. In addition, submit with bid for Owner's consideration the amount to be added or deducted from the base bid for other listed manufacturers' equipment. Owner will advise Contractor within forty-five (45) days after award of contract of his selection.

1.08 MATERIAL AND EQUIPMENT LIST

A. Within thirty (30) days after award of the contract, submit for Engineer's review a list of subcontractors' and manufacturers' names for items proposed for this project.

1.09 SUBMITTALS

A. Where the drawings and/or specifications indicate more than one allowable manufacturer for a particular piece of equipment and/or product, only those manufacturers indicated may submit products and services to be included in the work. Unless otherwise indicated, manufacturers other than those listed will not be acceptable.

B. Submit shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and obtain approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review.

C. Shop Drawings: Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment. Include equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, ductwork, and other items that must be shown to assure a coordinated installation. Wiring diagrams shall identify

circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted. All equipment and/or products shall be submitted by an authorized factory representative of that particular product.

D. Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

E. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), American Society of Mechanical Engineers (ASME), American Gas Association (AGA), American Refrigeration Institute (ARI), and Underwriters' Laboratories (UL), proof of such conformance shall be submitted to the Engineer for review. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable testing. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard. For materials and equipment whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for review. The certificate shall identify the manufacturer, the product, and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to all requirements of the project specification and of the referenced standards listed.

F. Contractor shall thoroughly review and stamp all submittals to indicate compliance with contract requirements prior to submission and coordinate installation requirements for equipment submitted, including, a) the verification of equipment weights relative to the existing and/or new structural support system and b) the verification of equipment dimensions relative to existing and/or new architectural conditions. Contractor shall be responsible for correctness of all submittals.

G. Submittals will be checked only for general conformance with the design concept and are subject to the original contract documents, as well as any corrections and comments noted. Comments noted, if any, will not be considered a complete list of all omissions, deviations and corrections necessary to meet the requirements of the contract documents. The contractor will be responsible to confirm that the final product and installation will be in conformance with the contract documents in their entirety, including the responsibility to fully coordinate all work with other trades and to confirm the correctness of dimensions, quantities, and capacities. Submittal review does not authorize or constitute a change to the contract requirements and does not release the contractor of responsibility to conform to the contract requirements. Requirements of the contract are not waived by review of any and all substitutions. The contractor must fulfill the terms of the contract.

H. Compliance Review Form: Each equipment submittal must include a Compliance Review Form formatted as follows:

1. Section 1: Certify that the submittal is in complete compliance with the plans and specifications, except for the numbered and footnoted deviations and exceptions as defined herein. Deviations or exceptions taken in a cover letter or by contradiction or omission shall not constitute a release from the requirement that the equipment be in complete compliance with the plans and specifications.
2. Section 2: Provide a detailed paragraph by paragraph annotation of the specification with an individual "C", "D", or "E" noted in the margin, as follows:

    a. "C" shall mean compliance with no exceptions. Provide a numbered footnote (i.e. C1, C2, C3, etc.) for each comment or clarification.
    b. "D" shall mean compliance with deviations. For each deviation, provide a numbered footnote (i.e. D1, D2, D3, etc.) with a detailed explanation of how the intent of this specification is to be satisfied.
    c. "E" shall mean exception. The equipment offered is not in compliance with the specifications. For each exception, provide a numbered footnote (i.e. E1, E2, E3, etc.) with a detailed description of the exception.

I. Electronic Submittals: Should the contractor elect to submit electronic shop drawings/submittals, the procedure shall be as follows:

1. Provide a transmittal with the electronic shop drawing/submittal indicating that the document was transmitted electronically. Transmittal shall also include verification of the contractor's review indicating compliance with the contract documents in accordance with paragraph 1.09.F of this section.
2. Sequentially number all pages on the electronic shop drawing/submittal. The total number of pages shall be reflected in the transmittal.
3. Submittal review comments shall be transmitted electronically. Large documents will be scanned with comments as necessary and returned electronically.
4. All shop drawings such as, but not limited to: coordination drawings, ductwork shop drawings, fire alarm drawings, ductbank layouts, etc. shall be submitted in hard copy, full size format.
5. Provide hard copy of the shop drawing/submittal for each of the Operations and Maintenance Manuals.
6. Failure to comply with the above will result in the submittal being returned and marked "Not Reviewed".

J. Submittals will be reviewed for general compliance with design concept in accordance with contract documents. Dimensions, quantities, weights, or other details will <u>not</u> be verified by the A/E; this is the responsibility of the Contractor.

K. Acceptance will not constitute waiver of contract requirements unless deviations are specifically indicated and clearly noted.

L. Review Period: BKM shall be allotted two (2) weeks for the processing, review and return of all submittals. It shall be incumbent upon the Contractor to include this time period in their schedule.

1. Resubmittals: BKM shall be allotted an additional two weeks (14 days) for the review of each resubmittal. Again, it shall be the Contractor's responsibility to submit the appropriate materials in a timely fashion.

2. Contract Extension: No extension in contract time will be authorized as a result of the timeline addressed above.

M. Submittal Identifications:

1. Place a permanent label or title block on each submittal for identification.
2. Indicate name of firm or entity that prepared each submittal on label or title block.
3. Provide a space approximately 4 by 5 inches on label or beside title block to record contractor's review and approval markings and action taken by A/E.
4. Include the following information on label for processing and recording action taken:

a. Project name
b. Date
c. Name and address of A/E
d. Name and address of contractor
e. Name and address of subcontractor
f. Name and address of supplier
g. Name of manufacturer
h. Unique identifier, including revision number
i. Number and title of appropriate specification section
j. Drawing number and detail references, as appropriate
k. Other necessary identification
l. Example: 230700-01-0

- 230700 references the spec section
- 01 indicates this is the first submittal from this spec section
- 0 indicates this is the original submittal (where 1 would indicate this is the first re-submittal)

N. The engineer will provide a maximum of two (2) submittal reviews per equipment submittal; the initial review plus one (1) re-submittal. Should the re-submittal be returned "Not Acceptable" or "Revise and Resubmit", the contractor shall provide the exact manufacturer and model indicated in the contract documents as the basis of design.

O. Resubmittals: Resubmittals shall comply with paragraph 1.09 of this section and the following additional requirements.

1. Resubmittals shall include a written response to each submittal comment. Provide a detailed comment by comment annotation of the submittal review comments with an individual "C", "D", or "E" as follows:

a. "C" shall mean compliance with no exceptions. Provide a numbered footnote (i.e. C1, C2, C3, etc.) for each comment or clarification.
b. "D" shall mean compliance with deviations. For each deviation, provide a numbered footnote (i.e. D1, D2, D3, etc.) with a detailed explanation of how the intent of this specification is to be satisfied.
c. "E" shall mean exception. The equipment offered is not in compliance with the specifications. For each exception, provide a numbered footnote (i.e. E1, E2, E3, etc.) with a detailed description of the exception.

1.10 MANUFACTURER'S RECOMMENDATIONS

A. Installation procedures are required to be in accordance with the recommendations of the manufacturer of the material being installed.

1.11 ACCESSIBILITY

A. Install equipment and materials to provide required access for servicing and maintenance. Coordinate the final location of concealed equipment and devices requiring access with final location of required access panels and doors. Allow ample space for removal of all parts that require replacement or servicing.

1.12 SAFETY REQUIREMENTS

A. Belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded in accordance with OSHA. High-temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified herein. Items such as catwalks, ladders, and guardrails shall be provided where required for safe operation and maintenance of equipment.

1.13 WORKMANSHIP

A. Remove and replace, at no extra cost, all work not orderly, reasonably neat, or workmanlike.

B. Coordinate all work and cooperate with other trades to facilitate execution of work.

1.14 SITE EXAMINATION/EXISTING CONDITIONS VERIFICATION

A. Failure to visit site and become familiar with existing conditions prior to bidding will not relieve the Contractor of responsibility for complying with the Contract documents.

B. Contractor shall field verify existing services and direction of flow of piping and ductwork prior to connection. Existing mechanical identification shall not constitute proper verification of service or direction of flow.

1.15 REGULATIONS AND PERMITS

A. Comply with all applicable codes and regulations.

B. All equipment provided shall be in accordance with all applicable local, state, and federal codes, guidelines and standards, as well as the authority having jurisdiction. Equipment and installation shall be in compliance with all applicable energy codes including the most current version of ASHRAE Standard 90.1.

C. Obtain and pay for all required permits.

1.16 CUTTING AND PATCHING

A. Unless otherwise directed, do all cutting and patching. Damaged work, including fireproofing and waterproofing shall be repaired by skilled mechanics of the trade involved.

B. Do not cut walls, floors, roofs, reinforced concrete or structural steel without structural Engineer's permission. Install services without affecting reinforcing steel.

C. In precast concrete plank drill all holes with a Carboloy tipped drill. Follow instructions of structural Engineer. Cut no reinforcing bars.

1.17 LINTELS

A. Under this Section provide all lintels not provided elsewhere which are required for openings for the installations of mechanical work. Lintels shall meet the requirements of the structural sections.

1.18 CLEANING UP

A. Keep premises free from accumulation of debris.

B. Remove tools, scaffolding, surplus material, debris, and leave premises broom clean.

C. On discontinuance of part of the work, place all debris in containers and promptly remove them from the Owner's property.

D. Leave all areas broom clean.

E. Final clean-up shall be performed.

1.20 PROTECTION

A. Protect mechanical and electrical material and equipment from the elements or other injury as soon as delivered on premises.

B. Cap or plug openings in equipment, piping, duct, and conduit systems to exclude dirt and other foreign material. Rags, wool, cotton, paper, waste or similar materials shall not be used for plugging.

C. Unless approved by Owner, HVAC equipment shall not be used for temporary heating or ventilation during construction.

D. Contractor shall protect all existing mechanical, electrical and architectural equipment, materials, finishes, etc. located within or adjacent to the work environment. Contractor shall be responsible for restoration of all existing mechanical, electrical and architectural items to remain. All equipment to remain must be restored to its pre-existing condition prior to the start of work. Restoration and/or replacement shall be at no cost to the Owner.

1.21 CLEANING OF SYSTEMS

A. After satisfactory completion of pressure tests and before permanently connecting fixtures, equipment, traps, strainers and other accessory items, thoroughly clean all systems. Blow out and flush piping until interiors are free of foreign matter.

B. Leave all systems clean, and in complete running order.

C. Equipment that has been subjected to the elements shall be cleaned of all rust, dirt and debris and repainted to match original finish.

1.22 FUNCTIONAL PERFORMANCE TESTING AND VERIFICATION

A. General: In addition to the tests required during and after installation of all mechanical systems, as well as any other formal commissioning requirements, the Contractor shall perform functional performance tests to verify that all systems are designed, installed, calibrated and adjusted to perform as required in the Contract.

B. Comply with all applicable specification sections including, but not be limited to, “Basic HVAC Requirements”, “Testing, Adjusting and Balancing”, “Automatic Temperature Controls” and “Commissioning”, where applicable.

C. Prior to functional performance testing, all indicating, recording and control devices shall be calibrated. A verification calibration report shall be provided with the final test report.

D. Provide functional performance testing to verify proper operation of each and every control sequence indicated throughout the contract documents.

E. Failure of Tests: Should any test, verification, or demonstration fail to meet the specification requirements, the component of the system causing the failure shall be repaired, replaced or readjusted. The failed test, verification, or demonstration shall then be repeated.

F. A “Functional Performance Test Verification Form” is included at the end of Section 230900. This form (electronic version is available upon request) shall be completed for all mechanical equipment provided under this contract. This shall include, but not be limited to each DX cooling equipment.

G. Test Report: Upon satisfactory verification of calibration and functional performance tests, a copy of the final test results shall be bound in the operations and maintenance manual. The final report shall also include a full compliance statement, on company letterhead, indicating that all systems are installed and functioning per the contract requirements including drawings, specifications, control sequences and accepted submittals.

H. The mechanical systems shall not be considered complete until all functional performance verification forms, calibration reports and compliance statement have been submitted and reviewed. Submit in accordance with the submittal requirements indicated elsewhere in these specifications.

1.23 OPERATING AND MAINTENANCE MANUAL

A. Submit Operation and Maintenance Manuals as follows:

3. Provide an electronic version for review by the Owner and A/E, including bookmarks of all section and subsections.

4. After acceptance of the electronic copy, produce hard copies in three-ring binders with each section separated by tab divider. Include protective

plastic sleeves for any software or folded large documents submitted. Provide a minimum of two (2) copies to the Owner.

B. At a minimum, the manual shall contain the following:

1. Title page
2. Table of contents
3. Contractor and sub-contractor contact information
4. Supplier contact information for all mechanical equipment
5. Copies of manufacturer's and contractor's warranty information (project and equipment) for all mechanical equipment.
6. Submittal log for all mechanical equipment
7. One (1) reviewed copy of each shop drawing or submittal incorporating all A/E and owner submittal review comments.
8. Copy of inspector acceptance certificates / documents.
9. Provide an 11 x 17 fold-out drawing of each floor plan.
10. All duct, pipe and equipment pressure test reports complete with 11 x 17 fold-out drawing, indicating all systems tested.
11. Final Test and Balance (TAB) Reports. Do not include reports that have not been accepted by the A/E. Pencil or partial copies will not be acceptable.
12. Maintenance procedures for each item of mechanical equipment to include frequency and type of maintenance, spare parts and attic/stock list. This shall include the manufacturer's literature indicating operating and maintenance instructions, parts list, illustrations and diagrams.
13. An itemized list of all spare parts and specialty tools shall be transmitted to the Owner.
14. A report of the training procedures and content provided as well as the attendance log.
15. Mechanical systems functional performance verification forms, calibration reports and compliance statement indicating that all systems are installed and functioning per the contract requirements.

1.25 FIELD INSTRUCTION

A. Upon completion of work, instruct Owner's representative in the proper operation and maintenance of the mechanical and electrical systems.

B. Instructions shall be given by persons expert in the following systems and equipment and shall include descriptions and demonstration of procedures, data logging, and analysis.

1.26 RECORD DOCUMENTS

A. The Contractor shall maintain a record set of mechanical prints at the project site and shall indicate thereon any changes made to the contract drawings, including, but not limited to addenda, field sketches, RFI responses, supplemental drawings, sketches, etc. Where changes are made that are reflective of supplemental instructions, revisions, RFI responses, etc., the Contractor shall make clear references to those changes.

B. A separate set of neat, legible mechanical contract prints shall be kept at the project site at all times during the construction of the work for the express purpose of showing any and all changes indicated in paragraph A. above. The prints shall

be marked up daily showing all changes to the original documents. The prints shall be marked up in a neat, legible manner using a red pen. Periodic review of the Record Documents will be conducted by the Owner's Representative or A/E. Should this review indicate that the Record Documents are deficient or not up to date, the Contractor shall immediately bring the documents into compliance and make the corrections.

C. Upon completion of the project and before final close-out, the Contractor shall be responsible for producing a final set of record documents in electronic CADD format. One (1) set of full size prints, one (1) CD of the electronic CADD drawings (in AutoCad and pdf format), along with the red-lined marked up field set shall be delivered to the owner upon completion. If requested, the electronic CADD documents shall be up-loaded to the owner's FTP site. The final CADD documents shall indicate in the title or revision block "RECORD DOCUMENTS" along with the date completed. The electronic format shall be compatible with the owner's preferred version of AutoCad. Coordinate with the owner before producing the CD or up-loading to the FTP site. Not acceptable are contractor installation drawings, shop drawings or multi-layers of work on a single drawing. The final as-built product shall mirror the contract bid documents using the project page layout, format and project title block.

D. Computer (CADD) files of mechanical drawings will be made available to the Contractor upon receipt of a signed waiver (available upon request). One CD will be made available to the general contractor or construction manager for distribution to the trades.

E. Should the Contractor's electronic Record Documents not be considered complete, they will be returned for completion and/or correction.

1.27 DEMOLITION

A. All demolition of existing mechanical and electrical piping, auxiliaries and equipment, shall be as specified under the Architectural "Demolition" section, of these specifications, as shown on the drawings, and as required to complete the new and renovated installations and shall be performed by the respective mechanical and electrical contractors.

B. This work shall include the disconnection and capping of existing services, relocation of certain equipment, and the removal of existing piping, wiring, fittings, equipment, including heat transfer units, air handling units, fans, electrical controls and panelboxes, ductwork, etc., not reused in the new work or required to complete the renovation work. Contractor shall note the drawings specify certain existing equipment to be reused.

C. Where supports and piping are removed, holes remaining in floors, walls and ceilings must be patched and refinished to match the adjoining original surfaces and finishes.

D. Any removed items requested by the Owner shall remain the property of the Owner. Contractor shall remove equipment and store on site as directed by the Owner. All other equipment or material shall become the property of the Contractor and shall be removed from the site. Contractor shall meet Federal EPA Laws, Regulations and Guidelines in regard to removal of asbestos insulation.

E. The contractor shall use care when performing selective building and site demolition. The contractor shall be responsible for damage inclusive of but not

limited to: building finishes, lighting (interior and exterior), furniture, structure, site, utilities (above and below ground), mechanical, plumbing, telecommunications and electrical equipment / systems. Should any damage occur or should any remedial work be required, the contractor shall be responsible to repair and or replace the damaged item(s) to the Owner's satisfaction at no additional cost. The contractor shall be responsible for surveying (including contacting Miss Utility), photo documenting and restoring the surrounding work site(s) to the original pre-demolition condition and / or to the Owner's satisfaction upon completion of the work at no additional cost.

1.28 OUTAGES

A. All mechanical outages which will interfere with the normal use of the building in any manner shall be done at such times as shall be mutually agreed upon by the Contractor and the Owner's Representative.

B. Unless otherwise specified, outages of any services required for the performance of this contract and affecting areas other than the immediate work area shall be scheduled at least ten (10) days in advance with the Owner's Representative. All such outages shall be performed during other than normal duty hours.

C. The Contractor shall include in his price the cost of all premium time required for outages and other work which interferes with the normal use of the building, which will be performed, in most cases, during other than normal work time and the convenience of the using agency.

1.29 GUARANTEE/WARRANTY

A. Each Contractor shall furnish a guarantee covering all labor and materials furnished by him for a period of two (2) years from the date of final acceptance of his work, and he shall agree to repair and make good at his own expense any and all defects which may appear in his work during that time if, in the judgment of the Engineer, such defects arise from defective workmanship and/or imperfect or inferior material.

B. The above shall not in any way void or abrogate equipment manufacturer's guarantee or warranty. Certificates of guarantee shall be delivered to the Owner.

C. Within the two (2) year warranty/guarantee period, manufacturer's recommended maintenance shall be provided by the Contractor.

D. In addition to the warranties indicated above, provide a five (5) year parts and labor warranty for each of the following:
1. All air conditioning unit related compressors (i.e. computer room air conditioning units, etc.).

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION 230100

SECTION 230200 – PROJECT CLOSEOUT HVAC

PART 1 – GENERAL

1.01 SUMMARY

A. This section provides a summary of the primary mechanical project closeout activities, however, this section does not attempt to address all project closeout requirements. Closeout activities referenced in this section include the following:

1. Pressure Testing
2. Start-up
3. Punch-out Procedures
4. Testing, Adjusting and Balancing
5. Functional Performance Testing and Verification
6. Operation and Maintenance Manuals (O & M Manuals)
7. Demonstration and Training
8. Record Documents
9. Close-out Documents

B. This Section shall not supersede any other close-out section or requirements of the Contract. Refer to other Divisions of the specifications and the General Requirements of the Contract for further instructions.

PART 2 – PRODUCTS

Not Applicable

PART 3 – EXECUTION

3.01 PRESSURE TESTING

A. Piping: The Contractor shall perform pressure testing on all piping systems as indicated in Division-23 section “Testing, Adjusting and Balancing”, and elsewhere as indicated.

B. Final pressure test results shall be submitted as a separate project submittal for review and included with the Test and Balance Report. Upon review for general conformance, include all pressure tests in the O & M Manual.

C. All factory performed equipment test results shall be included in the final O & M Manuals.

D. Where re-tests were required, indicate remedial action taken and submit in test report.

3.02 START-UP

A. The Contractor shall perform start-up on each piece of mechanical equipment as specified in each section of Division-23.

B. Where indicated in each section of Division-23, the services of a factory authorized and certified technician shall be required to perform the equipment start-up. Start-

up by any other organization other than as required by the manufacturer is unacceptable.

C. Start-up reports shall be provided for all equipment and be included in the final O & M Manuals.

3.03 PUNCH-OUT PROCEDURES

A. Preliminary Punch-out:

1. Prior to requesting an inspection from the Owner, Engineer, or Permit Official, the General Contractor or Construction Manager (GC or CM) shall provide a preliminary punch-out of the area in question.
2. Once completed, their punch list shall be supplied to each trade for corrections and completion. The punch list shall also be provided to the Engineer for their use.
3. Upon being informed that the trade contractors have addressed all of the outstanding items, the GC / CM shall backcheck the work and update the punch list.

B. Final Punch-out:

1. Final punch-out by the engineer shall not commence until the GC or CM has exhausted their review and has signed off on all items.
2. A copy of the sign-off shall be provided to the Engineer for their record.
3. Once the above has been completed, the Engineer shall be notified that the work is substantially complete and ready for a final punch-out.
4. Depending on the size, schedule, and project complexity, punch-outs may be requested for specific areas or systems, rather than the facility as a whole. Examples of specific requests include the following:

    a. Equipment rooms

C. Upon completion of any and all punch lists (i.e. above ceiling, final, partial, phased, factory review, or specific item) the contractor shall provide an item by item sign-off indicating the date and who completed the item. The sign-off shall be submitted to the A/E and owner before final payment is processed. Should the contractor disagree with any item, they shall provide a written exception giving reason for review.

3.04 TESTING, ADJUSTING AND BALANCING

A. Comply with all provisions of Division-23 Section, “Testing, Adjusting and Balancing” (TAB) for the systems listed, but not limited to, the following:

1. Building Automated Systems
2. Environmental Control Units

B. TAB reports shall be submitted as a separate project submittal for review. Upon review for general conformance, include the final TAB report in the O & M Manual.

C. Comply with testing, adjusting and balancing requirements as indicated in each section within Division-23.

3.05 FUNCTIONAL PERFORMANCE TESTING AND VERIFICATION

A. General: In addition to the tests required during and after installation of all mechanical systems, as well as any other formal commissioning requirements, the Contractor shall perform functional performance tests to verify that all systems are designed, installed, calibrated and adjusted to perform as required in the Contract.

B. Comply with all applicable specification sections including, but not be limited to, “Basic HVAC Requirements”, “Testing, Adjusting and Balancing”, “Automatic Temperature Controls” and “Commissioning”, where applicable.

C. Prior to functional performance testing, all indicating, recording and control devices shall be calibrated. A calibration verification report shall be provided with the final test report.

D. Provide functional performance testing to verify proper operation of each and every control sequence indicated throughout the contract documents.

E. Failure of Tests: Should any test, verification, or demonstration fail to meet the specification requirements, the component of the system causing the failure shall be repaired, replaced or readjusted. The failed test, verification, or demonstration shall then be repeated.

F. A “Functional Performance Test Verification Form” is included at the end of Section 230900. This form (electronic version is available upon request) shall be completed for all mechanical equipment provided under this contract. This shall include, but not be limited to each DX cooling equipment

G. Test Report: Upon satisfactory verification of calibration and functional performance tests, a copy of the final test results shall be bound in the operations and maintenance manual. The final report shall also include a full compliance statement, on company letterhead, indicating that all systems are installed and functioning per the contract requirements including drawings, specifications, control sequences and accepted submittals.

H. The mechanical systems shall not be considered complete until all functional performance verification forms, calibration reports and compliance statement have been submitted and reviewed. Submit in accordance with the submittal requirements indicated elsewhere in these specifications.

3.06 OPERATION AND MAINTENANCE MANUALS

A. Submit Operation and Maintenance Manuals as follows:

1. Provide an electronic version for review by the Owner and A/E, including bookmarks of all section and subsections.
2. After acceptance of the electronic copy, produce hard copies in three-ring binders with each section separated by tab divider. Include protective plastic sleeves for any software or folded large documents submitted. Provide a minimum of two (2) copies to the Owner.

B. At a minimum, the manual shall contain the following:

1. Title page

2. Table of contents
3. Contractor and sub-contractor contact information
4. Supplier contact information for all mechanical equipment
5. Copies of manufacturer's and contractor's warranty information (project and equipment) for all mechanical equipment.
6. Submittal log for all mechanical equipment
7. One (1) reviewed copy of each shop drawing or submittal incorporating all A/E and owner submittal review comments.
8. Copy of inspector acceptance certificates / documents.
9. Provide an 11 x 17 fold-out drawing of each floor plan and indicate locations of the following:

    a. System shutoff valves
    b. Fire dampers

10. All duct, pipe and equipment pressure test reports complete with 11 x 17 fold-out drawing, indicating all systems tested.
11. Final Test and Balance (TAB) Reports. Do not include reports that have not been accepted by the A/E. Pencil or partial copies will not be acceptable.
12. Maintenance procedures for each item of mechanical equipment to include frequency and type of maintenance, spare parts and attic/stock list. This shall include the manufacturer's literature indicating operating and maintenance instructions, parts list, illustrations and diagrams.
13. An itemized list of all spare parts and specialty tools shall be transmitted to the Owner.
14. A report of the training procedures and content provided as well as the attendance log.
15. Mechanical systems functional performance verification forms, calibration reports and compliance statement indicating that all systems are installed and functioning per the contract requirements.

3.07 DEMONSTRATION AND TRAINING

A. Upon completion of work, instruct the owner's representative in the proper operation and maintenance of each mechanical system in accordance with applicable specification sections.

B. Instructions shall be given by persons expert in the operation and maintenance of each system / equipment.

C. Prepare statement(s) for signing by Owner's representative indicating the date of completion of instructions and hours expended. Furnish copies of signed statements to the A/E.

D. Final demonstration of all mechanical equipment shall be recorded in DVD compatible format.

1. The recordings shall be organized systemically from largest to smallest component.
2. The recordings shall include bookmarks to reference each type of equipment, all major components, and each component requiring regular maintenance.
3. No segment shall be unannotated longer than fifteen minutes.

4. Submit a digital link of the draft for review by the owner and A/E.
5. Submit two hardcopy DVDs of the final approved copy to the owner's representative.
6. Submit a digital link of the final approved copy to the owner's representative.

3.08 RECORD DOCUMENTS

A. The Contractor shall maintain a record set of mechanical prints at the project site and shall indicate thereon any changes made to the contract drawings, including, but not limited to addenda, field sketches, RFI responses, supplemental drawings, sketches, etc. Where changes are made that are reflective of supplemental instructions, revisions, RFI responses, etc., the Contractor shall make clear references to those changes.

B. A separate set of neat, legible mechanical contract prints shall be kept at the project site at all times during the construction of the work for the express purpose of showing any and all changes indicated in paragraph A. above. The prints shall be marked up daily showing all changes to the original documents. The prints shall be marked up in a neat, legible manner using a red pen. Periodic review of the Record Documents will be conducted by the Owner's Representative or A/E. Should this review indicate that the Record Documents are deficient or not up to date, the Contractor shall immediately bring the documents into compliance and make the corrections

C. Upon completion of the project and before final close-out, the Contractor shall be responsible for producing a final set of record documents in electronic CADD format. One (1) set of full size prints, one (1) CD of the electronic CADD drawings (in AutoCad and pdf format), along with the red-lined marked up field set shall be delivered to the owner upon completion. If requested, the electronic CADD documents shall be up-loaded to the owner's FTP site. The final CADD documents shall indicate in the title or revision block "RECORD DOCUMENTS" along with the date completed. The electronic format shall be compatible with the owner's preferred version of AutoCad. Coordinate with the owner before producing the CD or up-loading to the FTP site. Not acceptable are contractor installation drawings, shop drawings or multi-layers of work on a single drawing. The final as- built product shall mirror the contract bid documents using the project page layout, format and project title block.

D. Computer (CADD) files of mechanical drawings will be made available to the Contractor upon receipt of a signed waiver (available upon request). One CD will be made available to the general contractor or construction manager for distribution to the trades.

E. Should the Contractor's electronic Record Documents not be considered complete, they will be returned for completion and/or correction.

3.09 CLOSEOUT DOCUMENTS

A. Prior to Substantial Completion and /or Final Payment, the Contractor shall prepare and submit the following:

1. Final punch lists indicating completion of all items
2. All record drawings

3. All record specifications
4. Operation and Maintenance Manuals
5. Complete final cleaning
6. Remove temporary facilities and complete site restoration

END OF SECTION 230200

SECTION 230500 - BASIC HVAC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 CONTRACT DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification Sections, apply to this Section.

B. Requirements specified in Division-23 Section "Basic HVAC Requirements" apply to this Section.

1.2 SUMMARY

A. This Section includes limited scope general construction materials and methods for application with mechanical installations as follows:

1. Mechanical equipment nameplate data.

2. Firestopping: Provide seals for all openings (new and existing) through fire-rated walls, floors, or ceilings used as passage for mechanical and electrical components such as piping, ductwork, conduit, etc.

3. Selective demolition including:

a. Nondestructive removal of materials and equipment for reuse or salvage as indicated.

b. Dismantling mechanical materials and equipment made obsolete by these installations.

4. Miscellaneous metals for support of mechanical materials and equipment.

5. Wood grounds, nailers, blocking, fasteners, and anchorage for support of mechanical materials and equipment.

6. Joint sealers for sealing around mechanical materials and equipment; and for sealing penetrations in fire and smoke barriers, floors, and foundation walls.

1.3 DEFINITIONS

A. The following definitions apply to firestopping:

1. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.

2. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.

3. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire, gases and smoke.

4. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.

5. Construction Gaps: Gaps between adjacent sections of walls, exterior walls, at wall tops between top of wall and ceiling, and structural floors or roof decks; and gaps between adjacent sections of structural floors.

6. System: Specific products and applications classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.

7. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division-01 Specification Sections.

B. Product data for the following products:

1. Joint sealers

C. Firestopping: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures.

1. Provide details of each proposed assembly identifying intended products and applicable UL system number, or UL classified devices.

2. Provide drawings relating to non-standard applications as needed.

D. Shop drawings detailing fabrication and installation for metal fabrications, and wood supports and anchorage for mechanical materials and equipment.

E. Coordination drawings for access panel and door locations in accordance with Division-23 sections.

F. Samples of joint sealer, consisting of strips of actual products showing full range of colors available for each product.

G. Welder certificates, signed by Contractor, certifying that welders comply with requirements specified under "Quality Assurance" article of this Section.

H. Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of utility services and details for dust and noise control.

1. Coordinate sequencing with construction phasing and Owner occupancy specified in Division-01 Section "Summary of Work."

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an Installer for the installation and application of joint sealers, access panels and doors, and firestopping materials with at least two years' experience with installations.

B. Local and State Regulatory Requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL firestop system numbers, or UL classified devices.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver joint sealer materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

1.7 PROJECT CONDITIONS

A. Conditions Affecting Selective Demolition: The following project conditions apply:

1. Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.

2. Locate, identify, and protect mechanical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.

1.8 SEQUENCE AND SCHEDULING

A. Coordinate the shut-off and disconnection of utility services with the Owner and the utility company.

B. Notify the Architect at least five (5) days prior to commencing demolition operations.

C. Perform demolition in phases as indicated.

PART 2 - PRODUCTS

2.1 MECHANICAL EQUIPMENT NAMEPLATE DATA

A. Nameplate: For each piece of power operated mechanical equipment provide a permanent operational data nameplate indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

2.2 FIRESTOPPING

A. All penetrations through fire barriers (new and existing) shall be firestopped with an approved material that is capable of maintaining the fire resistance rating of the barrier. All firestop sealants shall conform to ASTM E 814, ASTM E 119, UL 1479, UL 2079 CAN/ULC S115, and CAN/ULC S101.

B. Firestop material shall be latex based, intumescent caulk intended for use for all thru-penetrations with piping, ducts, cable trays, conduit, and cables.

C. When exposed to high temperatures or fires, the caulk shall expand in volume to quickly close off voids left by melting or burning construction materials. Caulk shall be applied by a standard caulk gun and remain flexible after curing.

D. Acceptable products shall be limited to Johns Manville “Firetemp-C1;” Hilti “FS-One;” or 3M “CP25WB+.” Coordinate with General Contractor such that a single manufacturer/ product is utilized throughout the project for all fire and smoke stopping materials.

2.3 SMOKE STOPPING

A. All penetrations through smoke barriers, smoke partitions, or any other surface required to resist the passage of smoke (new and existing) shall be provided with a smoke stop sealant and/or system that has been independently tested to provide an acceptable smoke seal that will resist the passage of smoke. Smoke stop systems (including product and installation) shall conform to all applicable standards (including but not limited to ASTM, UL and NFPA), as well as all other local, state or federal requirements.

B. Acceptable manufacturers shall be limited to the manufacturers that may provide firestopping materials/systems (see paragraph 2.02 of this section). Coordinate with the General Contractor such that a single manufacturer/product is utilized throughout the project for all fire and smoke stopping materials.

2.4 MISCELLANEOUS METALS

A. Steel plates, shapes, bars, and bar grating: ASTM A 36.

B. Cold-Formed Steel Tubing: ASTM A 500.

C. Hot-Rolled Steel Tubing: ASTM A 501.

D. Steel Pipe: ASTM A 53, Schedule 40, welded.

E. Non-shrink, Non-metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout, recommended for interior and exterior applications.

F. Fasteners: Zinc-coated, type, grade, and class as required.

2.5 MISCELLANEOUS LUMBER

A. Framing Materials: Standard Grade, light-framing-size lumber of any species. Number 3 Common or Standard Grade boards complying with WCLIB or AWPA

rules, or Number 3 boards complying with SPIB rules. Lumber shall be preservative treated in accordance with AWPB LP-2, and kiln dried to a moisture content of not more than 19 percent.

B. Construction Panels: Plywood panels; APA C-D PLUGGED INT, with exterior glue; thickness as indicated, or if not indicated, not less than 15/32 inches (12 mm).

2.6 JOINT SEALERS

A. General: Joint sealers, joint fillers, and other related materials compatible with each other and with joint substrates under conditions of service and application.

B. Colors: As selected by the Architect from manufacturer's standard colors.

C. Elastomeric Joint Sealers: Provide the following types:

1. One-part, nonacid-curing, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for masonry, glass, aluminum, and other substrates recommended by the sealant manufacturer.

2. One-part, mildew-resistant, silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for uses in non-traffic areas for glass, aluminum, and nonporous joint substrates; formulated with fungicide; intended for sealing interior joints with non-porous substrates; and subject to in-service exposure to conditions of high humidity and temperature extremes.

D. Acrylic-Emulsion Sealants: One-part, non-sag, mildew-resistant, paintable complying with ASTM C 834 recommended for exposed applications on interior and protected exterior locations involving joint movement of not more than plus or minus 5 percent.

E. Fire-Resistant Joint Sealers: Two-part, foamed-in-place, silicone sealant formulated for use in through-penetration fire-stopping around cables, conduit, pipes, and duct penetrations through fire rated walls and floors. Sealants and accessories shall have fire resistance ratings indicated, as established by testing identical assemblies in accordance with ASTM E 814, by Underwriters' Laboratories, Inc., or other testing and inspection agency acceptable to authorities having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 FIRESTOP INSTALLATION

A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.

B. Seal new and existing holes or voids made by penetrations to ensure an effective smoke barrier.

C. Protect materials from damage on surface subject to traffic.

D. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray, bus duct or other items, close unused portions of opening with firestopping material tested for the application.

E. Install smoke stopping as specified for firestopping (new and existing).

3.3 PREPARATION FOR JOINT SEALERS

A. Surface Cleaning for Joint Sealers: Clean surfaces of joints immediately before applying joint sealers to comply with recommendations of joint sealer manufacturer.

B. Apply joint sealer primer to substrates as recommended by joint sealer manufacturer. Protect adjacent areas from spillage and migration of primers, using masking tape. Remove tape immediately after tooling without disturbing joint seal.

3.4 SELECTIVE DEMOLITION

A. General: Demolish, remove, demount, and disconnect abandoned mechanical materials and equipment indicated to be removed and not indicated to be salvaged or saved.

B. Materials and Equipment to be Salvaged: Remove, demount, and disconnect existing mechanical materials and equipment indicated to be removed and salvaged, and deliver materials and equipment to the location designated for storage.

C. Disposal and Cleanup: Remove from the site and legally dispose of demolished materials and equipment not indicated to be salvaged.

D. Mechanical Materials and Equipment: Demolish, remove, demount, and disconnect the following items:

1. Inactive and obsolete piping, fittings and specialties, equipment, ductwork, controls, fixtures, and insulation.

2. Piping and ducts embedded in floors, walls, and ceilings may remain if such materials do not interfere with new installations. Remove materials above accessible ceilings. Drain and cap piping and ducts that are allowed to remain.

3. Perform cutting and patching required for demolition in accordance with Division-1 Section "Cutting and Patching."

3.5 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Field Welding: Comply with AWS "Structural Welding Code."

3.6 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

3.7 APPLICATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.

1. Comply with recommendations of ASTM C 962 for use of elastomeric joint sealants.

2. Comply with recommendations of ASTM C 790 for use of acrylic emulsion joint sealants.

B. Tooling: Immediately after sealant application and prior to time shinning or curing begins, tool sealants to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

END OF SECTION 230500

SECTION 230529 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of hangers and supports required by this section is indicated on drawings and/or specified in other Division-23 sections.

B. Types of hangers and supports specified in this section include the following:

1. Horizontal-Piping Hangers and Supports
2. Vertical-Piping Clamps
3. Hanger-Rod Attachments
4. Building Attachments
5. Saddles and Shields
6. Spring Hangers and Supports
7. Miscellaneous Materials
8. Anchors

C. Hangers and supports furnished as part of factory-fabricated equipment are specified as part of equipment assembly in other Division-23 sections.

1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of hangers and supports, of types and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Codes and Standards:

1. Code Compliance: Comply with applicable codes pertaining to product materials and installation of hangers and supports.

2. NFPA, UL, and FM Compliance: Provide products which comply with NFPA 13 listed and labeled by UL and FM where used for fire protection piping systems.

3. MSS Standard Compliance:

a. Provide pipe hangers and supports of which materials, design, and manufacture comply with MSS SP-58.
b. Select and apply pipe hangers and supports, complying with MSS SP-69.
c. Fabricate and install pipe hangers and supports, complying with MSS SP-89.
d. Terminology used in this section is defined in MSS SP-90.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, including installation instructions for each type of support and anchor. Submit pipe hanger and support schedule showing manufacturer's figure number, size, location, and features for each required pipe hanger and support.

PART 2 - PRODUCTS

2.01 HORIZONTAL-PIPING HANGERS AND SUPPORTS

A. General: Except as otherwise indicated, provide factory-fabricated horizontal-piping hangers and supports complying with MSS SP-58, selected by Installer to suit horizontal-piping systems in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems. To avoid future electrolysis or corrosion, copper plated hangers, supports, clamps, rod attachments, and building attachments shall not be in direct contact with copper piping. A separation material shall be installed between the pipe and the copper plated hanger, support, clamp, etc. The separation material shall prohibit electrical conductance and prevent galvanic action or corrosion between dissimilar metals. Separation material shall be guaranteed for a minimum of thirty (30) years.

2.02 VERTICAL-PIPING CLAMPS

A. General: Except as otherwise indicated, provide factory-fabricated vertical-piping clamps complying with MSS SP-58, selected by Installer to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper-plated hangers and supports for copper-piping systems. To avoid future electrolysis or corrosion, copper plated hangers, supports, clamps, rod attachments, and building attachments shall not be in direct contact with copper piping. A separation material shall be installed between the pipe and the copper plated hanger, support, clamp, etc. The separation material shall prohibit electrical conductance and prevent galvanic action or corrosion between dissimilar metals. Separation material shall be guaranteed for a minimum of thirty (30) years.

2.03 HANGER-ROD ATTACHMENTS

A. General: Except as otherwise indicated, provide factory-fabricated hanger-rod attachments complying with MSS SP-58, selected by Installer to suit horizontal-piping hangers and building attachments, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select size of hanger-rod attachments to suit hanger rods. Provide copper-plated hanger-rod attachments for copper-piping systems. To avoid future electrolysis or corrosion, copper plated hangers, supports, clamps, rod attachments, and building attachments shall not be in direct contact with copper piping. A separation material shall be installed between the pipe and the copper plated hanger, support, clamp, etc. The separation material shall prohibit electrical conductance and prevent galvanic action or corrosion between dissimilar metals. Separation material shall be guaranteed for a minimum of thirty (30) years.

2.04 BUILDING ATTACHMENTS

A. General: Except as otherwise indicated, provide factory-fabricated building attachments complying with MSS SP-58, selected by Installer to suit building

substrate conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods. Provide copper-plated building attachments for copper-piping systems. Provide copper-plated hangers and supports for copper-piping systems. To avoid future electrolysis or corrosion, copper plated hangers, supports, clamps, rod attachments, and building attachments shall not be in direct contact with copper piping. A separation material shall be installed between the pipe and the copper plated hanger, support, clamp, etc. The separation material shall prohibit electrical conductance and prevent galvanic action or corrosion between dissimilar metals. Separation material shall be guaranteed for a minimum of thirty (30) years.

2.05 SADDLES AND SHIELDS

A. General: Except as otherwise indicated, provide saddles or shields under piping hangers and supports, factory-fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.

2.06 SPRING HANGERS AND SUPPORTS

A. General: Except as otherwise indicated, provide factory-fabricated spring hangers and supports complying with MSS SP-58, selected by Installer to suit piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Use only one type by one manufacturer for each piping service. Select spring hangers and supports to suit pipe size and loading.

2.07 MISCELLANEOUS MATERIALS

A. Metal Framing: Provide products complying with NEMA STD ML 1.

B. Steel Plates, Shapes and Bars: Provide products complying with ASTM A 36.

C. Cement Grout: Portland cement (ASTM C 150, Type I or Type III) and clean uniformly graded, natural sand (ASTM C 404, Size No. 2).

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine areas and conditions under which hangers and supports are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF BUILDING ATTACHMENTS

A. Install attachments at required locations within concrete or steel for proper piping support. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert securely to forms. Where concrete with compressive strength less than 2500 psi (17240 kPa) is indicated, install reinforcing bars through openings at top of inserts.

3.03 INSTALLATION OF HANGERS AND SUPPORTS

A. General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Install supports with maximum spacings complying with MSS SP-69. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.

C. Support fire-water piping independently of other piping.

D. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.

E. Provisions for Movement:

1. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

F. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

G. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 Pressure Piping Codes are not exceeded.

H. Insulated Piping: Comply with the following installation requirements.

1. Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ANSI B31.

2. Shields: Where low-compressive-strength insulation or vapor barriers are indicated on chilled water piping, install coated protective shields.

3. Saddles: Where insulation without vapor barrier is indicated, install protection saddles.

I. Spacing: Hanger spacing for piping shall not exceed 8 feet (2400 mm) on centers for pipe 1-1/4" (32 mm) or smaller, and 10 feet (3 m) for pipe 1-1/2" (40 mm) and larger. Regardless of spacing, hangers shall be provided at or near all changes in direction, both vertical and horizontal, for all piping. For cast iron soil pipe, one hanger shall be placed at each hub or bell.

3.04 ADJUSTMENT OF HANGERS AND SUPPORTS

A. Adjust hangers and supports and place grout as required under supports to bring piping to proper levels and elevations.

3.06 PAINTING

A. All hangers, supports, clamps and assemblies shall be primed and painted with rust inhibitors.

END OF SECTION 230529

SECTION 232300 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of refrigerant piping work is indicated by requirements of this section and all other Division-23 sections.

B. Refer to requirements of Division-26.

1.2 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of refrigerant piping products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Installer's Qualifications: Specialist with at least five (5) years of successful installation experience on projects with refrigerant piping work similar to that required for project.

C. Codes and Standards:

1. ASME Compliance: Fabricate and install refrigerant piping in accordance with ASME B31.5, "Refrigeration Piping", and extend applicable lower pressure limits to pressures below 15 psig (100 kPa).

2. IMC Compliance: Fabricate and install refrigerant piping in accordance with “International Mechanical Code".

3. ASHRAE Compliance: Fabricate and install refrigerant piping in accordance with ASHRAE 15 "Safety Code for Mechanical Refrigeration".

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for refrigerant piping materials and products.

B. Brazing Certification: Certify brazing procedures, brazers and operators in accordance with ASME standards (ASME B31.5).

C. Shop Drawings: Submit scaled layout drawings of refrigerant pipe and fittings including, but not necessarily limited to, pipe and tube sizes, locations, elevations and slopes of horizontal runs, wall and floor penetrations, and connections. Show interface and spatial relationship between piping and proximate equipment.

D. Maintenance Data: Submit maintenance data and parts lists for refrigerant piping materials and products. Include this data, product data, shop drawings, and record drawings in maintenance manual.

PART 2 - PRODUCTS

2.1 MATERIALS AND PRODUCTS

A. General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with ASME B31.5 Code for Refrigeration Piping where applicable, base pressure rating on refrigerant piping system maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in refrigerant piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.

2.2 BASIC IDENTIFICATION

A. General: Provide identification complying with Division-23 sections "Basic HVAC Materials and Methods" and in accordance with the following listing:

1. Refrigerant Piping: Plastic pipe markers.

2.3 BASIC PIPES AND PIPE FITTINGS

A. General: Provide pipes and pipe fittings complying with Division-23 sections "Basic HVAC Materials and Methods" and in accordance with the following listing:

1. Tube Size 4-1/8" (105 mm) and Smaller: Copper tube; Type ACR, hard drawn temper; wrought-copper fittings; brazed joints.

2. Tube Size 1/2" (13 mm) and Smaller: Copper tube; Type ACR, soft annealed temper; wrought-copper fittings, brazed joints.

3. Brazed Joints: Braze joints using American Welding Society (AWS) classification BCuP-5 for brazing filler metal.

2.4 BASIC PIPING SPECIALTIES

A. General: Provide piping specialties complying with Division-23 sections "Basic HVAC Materials and Methods" in accordance with the following listing:

1. Pipe escutcheons

2. Drip pans

3. Sleeves

4. Sleeve seals

2.5 BASIC HANGERS AND SUPPORTS

A. General: Provide hangers and supports complying with Division-23 sections "Basic HVAC Materials and Methods" and Hangers and Supports for HVAC Piping and Equipment", in accordance with the following listing:

1. Adjustable steel clevises, adjustable roller hangers, and adjustable pipe roll stands for horizontal piping hangers and supports.

2. Two-bolt riser clamps for vertical piping supports.

3. Concrete inserts, C-clamps, and steel brackets for building attachments.

4. Protection shields for insulated piping support in hangers.

5. Copper flashings for piping penetrations.

2.6 SPECIAL REFRIGERANT VALVES

A. General: Special valves required for refrigerant piping include the following types:

1. Globe and Check Valves:

a. Globe Shutoff Valves: Forged brass, packed, back seating, winged seal cap, 300°F (149°C) temperature rating, 500 psi (3450 kPa) working pressure.

b. Check Valves: Forged brass, accessible internal parts, soft synthetic seat, fully guided brass piston and stainless steel spring, 250°F (121°C) temperature rating, 500 psi (3450 kPa) working pressure.

2. Solenoid Valves:

a. 2-Way Solenoid Valves: Forged brass, designed to conform to ARI 760, normally closed, teflon valve seat, NEMA 1 solenoid enclosure, 24 volt, 60 Hz., UL-listed, 1/2" (13 mm) conduit adapter, 250°F (121°C) temperature rating, 400 psi (2720 kPa) working pressure.

1) Manual Operator: Provide manual operator to open valve.

3. Ball Valves:

a. Ball Valve with Access Port: Compatible with all CFC, HCFC and HFC refrigerants and oils, designed for pressures up to 775 psig, and temperature range of -40°F (-40°C) to 300°F (149°C), full port construction to match line size ID, internally equalized ball design, rupture-proof encapsulated stem, UL listed.

1) Confirm compatibility with selected VRF/equipment manufacturer.

2.7 REFRIGERANT SPECIALTIES

A. Refrigerant Strainers: Brass shell and end connections, brazed joints, monel, screen, 100 mesh, UL-listed, 350 psi (2380 kPa) working pressure.

B. Moisture-Liquid Indicators: Forged brass, single port, removable polished optical glass, solder connections, UL-listed, 200°F (93°C) temperature rating, 500 psi (3450 kPa) working pressure.

C. Refrigerant Filter-Driers: Steel shell, ceramic fired desiccant core, solder connections, UL-listed, 500 psi (3450 kPa) working pressure.

D. Refrigerant Filter-Driers: Corrosion-resistant steel shell, steel flange ring and spring, wrought copper fittings, ductile iron cover plate with steel cap screws, replaceable filter-drier core, 500 psi (3450 kPa) working pressure.

E. Evaporator Pressure Regulators: Provide corrosion-resistant, spring loaded, stainless steel springs, pressure operated, evaporator pressure regulator, in size and working pressure indicated, with copper connections.

F. Refrigerant Discharge Line Mufflers: Provide discharge line mufflers as recommended by equipment manufacturer for use in service indicated, UL-listed.

2.8 BASIC VIBRATION CONTROL

A. General: Provide vibration control products complying with Division-23 sections" Basic HVAC Materials and Methods" in accordance with the following listing:

1. Isolation hangers

2. Riser isolators

3. Riser support isolators

4. Flexible pipe connectors

PART 3 - EXECUTION

3.1 INSPECTION

A. General: Examine areas and conditions under which refrigerant piping systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 INSTALLATION OF BASIC IDENTIFICATION

A. General: Install mechanical identification in accordance with Division-23 sections "Basic HVAC Materials and Methods".

B. MANUFACTURERS

1. Available Manufacturers: Subject to compliance with requirements, manufacturers' products which may be incorporated in the work include the following:

a. Brady

b. Seton

c. Bunting

d. Brimar

C. MECHANICAL IDENTIFICATION MATERIALS

1. General: Provide manufacturer's standard products of categories and types required for each application as referenced in other Division-23 sections. Where more than single type is specified for application, selection is Installer's option but provide single selection for each product category.

D. PIPE AND DUCT MARKERS

1. Snap-on Type: Provide pre-printed, semi-rigid, snap-on color coded identification sleeves complying with ANSI A13.1. This type shall be used for insulated pipe sizes 2” and smaller.

a. Flow Direction: Provide flow directional arrows either as part of markers, or separately attached to pipes and ducts.

2. Locate pipe markers as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) exterior non-concealed, locations, and concealed gas piping.

a. Near locations where pipes pass through walls or floors/ceilings, or enter non-accessible enclosures.

b. Near major equipment items and other points of origination and termination.

c. Spaced intermediately at maximum spacing of 25 feet (7500 mm) along each piping run.

3.3 INSTALLATION OF REFRIGERANT PIPING

A. General: Install refrigerant piping in accordance with Division-23 sections "Basic HVAC Materials and Methods" and in compliance with equipment manufacturer's recommendations.

B. Install refrigerant piping with 1/4" per foot (6 mm per meter) (1%) downward slope in direction of oil return to compressor. Provide oil traps and double risers where indicated, and where required to provide oil return.

C. Clean refrigerant piping by swabbing with dry lintless (linen) cloth, followed by refrigerant oil soaked swab. Remove excess oil by swabbing with cloth soaked in high flash point petroleum solvent, squeezed dry.

D. Bleed dry nitrogen through refrigerant piping during brazing operations.

3.4 INSTALLATION OF PIPING SPECIALTIES

A. Install piping specialties in accordance with requirements of Division-23 sections "Basic HVAC Materials and Methods".

3.5 INSTALLATION OF HANGERS AND SUPPORTS

A. Install supports and anchors in accordance with requirements of Division-23 sections "Basic HVAC Materials and Methods" and "Hangers and Supports for HVAC Piping and Equipment".

3.6 INSTALLATION OF SPECIAL REFRIGERANT VALVES

A. General: Install refrigerant valves where indicated, and in accordance with manufacturer's instructions. Remove accessible internal parts before soldering or brazing, replace after joints are completed.

1. Solenoid Valves: Install in refrigerant piping as indicated with stem pointing upwards.

a. Wiring of solenoid valves is specified in applicable Division-26 sections, and is included as work of this section.

3.7 INSTALLATION OF REFRIGERANT ACCESSORIES

A. Refrigerant Strainers: Install in refrigerant lines as indicated, and in accessible location for service.

B. Moisture-Liquid Indicators: Install as indicated on refrigerant liquid lines, in accessible location.

C. Refrigerant Filter-Dryers: Install in refrigerant lines as indicated, and in accessible location for service.

D. Evaporator Pressure Regulators: Install in refrigerant suction lines or evaporator outlets as indicated. Adjust, if required, for proper evaporator pressure.

E. Refrigerant Discharge Line Mufflers: Install as indicated, in horizontal or downflow portion of hot-gas lines, immediately after leaving compressor; not in riser.

3.8 EQUIPMENT CONNECTIONS

A. General: Connect refrigerant piping to mechanical equipment as indicated, and comply with equipment manufacturer's instructions where not otherwise indicated.

3.9 FIELD QUALITY CONTROL

A. Refrigerant Piping Leak Test: Prior to initial operation, clean and test refrigerant piping in accordance with ASME B31.5, "Refrigeration Piping". Perform initial test with dry nitrogen, using soap solution to test all joints. Refrigerant piping shall be pressure tested and evacuated in accordance with the system manufacturer’s recommendations, and /or as follows (whichever is more stringent):

1. Pressure Test (Air Tight Test): Pressurize the suction gas pipe, high/low pressure gas pipe and liquid pipe with dry nitrogen to a minimum pressure as per the system manufacturer. Pressure test duration shall be a minimum of 24 hours. If the pressure does not drop within the 24 hour period, the system passes. If there is a drop in pressure, check for leaks, make repairs and re-test as prescribed above.

2. Evacuation Test (Vacuum Drying): Evacuate the system from the suction gas pipe, high/low pressure gas pipe and liquid pipe to a minimum vacuum pressure as per the system manufacturer. Vacuum pressure shall be maintained in accordance with manufacturer's minimum duration recommended. If it rises, the system may either contain moisture or have leaks, if so, make repairs and re-test as prescribed above.

3. Refer to the Refrigerant Leakage Test Summary Form to document test results. No other form will be acceptable. Submit results for all systems for review.

B. Repair or replace refrigerant piping as required to eliminate leaks, and retest as specified to demonstrate compliance.

3.10 DEHYDRATION AND CHARGING SYSTEM

A. Install core in filter dryer after leak test but before evacuation.

B. Evacuate refrigerant system with vacuum pump, until temperature of 35°F (2°C) is indicated on vacuum dehydration indicator.

C. During evacuation, apply heat to pockets, elbows, and low spots in piping.

D. Maintain vacuum on system for minimum of five (5) hours after closing valve between vacuum pump and system.

E. Break vacuum with refrigerant gas, allow pressure to build up to 2 psi (14 kPa).

F. Complete charging of system, using new filter dryer core in charging line. Provide full operating charge.

3.11 ADJUSTING AND CLEANING

A. Cleaning and Inspecting: Clean and inspect refrigerant piping systems in accordance with requirements of Division-23 section "Pipe, Tube and Fittings for HVAC Systems".

END OF SECTION 232300

SECTION 238119 - ENVIRONMENTAL CONTROL AIR CONDITIONING UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Scope: Extent of environmental control air conditioning unit work required by this Section is indicated on drawings and schedules, by requirements of this Section, and all other Division-23 Sections.

B. Refer to requirements of Division-26.

1.2 QUALITY ASSURANCE

A. Manufacturer: Provide environmental control air conditioning units that are the standard product of an equipment manufacturer regularly engaged in the production of such units who issues complete catalog information on such products. Units shall not be field fabricated.

B. Certifications: Submit certified technical and test data indicating compliance with the capacities specified.

C. Codes and Standards: Provide environmental control air conditioning units conforming to the following:

1. Air-Conditioning and Refrigeration Institution (ARI): Comply with ARI 240.

2. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE): Construct and install refrigerant coils in accordance with ASHRAE 15, "Safety Code for Mechanical Refrigeration."

3. National Electrical Manufacturers Association (NEMA): Provide electrical components required as part of environmental control air conditioning units, which comply with NEMA Standards.

4. National Fire Protection Association (NFPA): Comply with NFPA 70, "National Electrical Code" as applicable to installation and electrical connections of ancillary electrical components of environmental control air conditioning units.

5. Underwriters Laboratories, Inc. (UL): Provide electrical components required as part of environmental control air conditioning units, which have been listed and labeled by UL.

D. Certifications: Submit certified technical and test data indicating compliance with the capacities specified.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data for air conditioning units showing dimensions, weights, capacities, ratings, fan performance with operating point clearly indicated, motor electrical characteristics, finishes of materials, and installation instructions.

B. Maintenance Data: Submit maintenance instructions, including instructions for lubrication, filter replacement, motor and drive replacement, and spare parts list. Include this data, product data, shop drawings, and wiring diagrams in maintenance manuals in accordance with requirements of Division-01.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver environmental control air conditioning unit with factory-installed shipping skids and lifting lugs; pack components in factory-fabricated protective containers.

B. Handling: Handle environmental control air conditioning units carefully to avoid damage to components, enclosures, and finish. Do not install damaged components. Replace damaged units with new units.

C. Storage: Store environmental control air conditioning units in a clean, dry place and protect from weather and construction traffic.

D. Unloading: Comply with manufacturer's rigging instructions for unloading air conditioning units and condensing units, and moving them to final location.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work will be limited to:

1. Basis of Design: Mitsubishi

2. Panasonic

3. Daikin

2.2 ENVIRONMENTAL CONTROL AIR CONDITIONING UNITS

A. General: Provide factory assembled air conditioning system complete with split system compact wall mounted packaged evaporator section and matching outdoor unit. The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label. All wiring shall be in accordance with the National Electrical Code (NEC). The units shall be rated in accordance with ARI Standard 240 and bear the ARI label. A full charge of R-454B for 100 feet of refrigerant tubing shall be provided in the condensing unit. A dry nitrogen holding charge shall be provided in the evaporator. System SEER shall meet or exceed 1992 Federal Standards.

B. Capacities: Provide environmental control air conditioning units of capacity and type as indicated on the drawings and schedules.

C. Warranty: The units shall have a manufacturer’s warranty for a period of one (1) year from date of installation. The compressor shall have a warranty of six (6) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced at the contractor’s expense. Manufacturer shall have ten (10) years’ experience in the U.S. market.

D. Components: Provide environmental control air conditioning units that draw air through filter and coils, and that include fans, compressors, cooling coils, reheat coils, filters, remote air cooled condensing units, motors, starters, controls, and all other components necessary for proper operation.

1. Units shall be furnished complete with remote air cooled condensing unit factory assembled and tested by manufacturers of environmental control air conditioning units.

2. For units installed above ceiling, provide a secondary drain pan with leak detection. Leak detection shall alarm at the building automation system (BAS) and shall de-energize the unit.

E. Indoor Evaporator Unit: The indoor evaporator unit shall be factory assembled and wired. The casing shall have a white finish. The evaporator fan shall be an assembly with line flow fans direct driven by a single motor. The fan shall be statically and dynamically balanced and run on permanently lubricated bearings. An adjustable guide vane shall be provided with the ability to change the air flow from horizontal to vertical. A motorized air sweep flow louver shall provide an automatic change in air flow by directing the air from side to side for uniform air distribution. Return air shall be filtered by means of an easily removable washable filter. The evaporator coil shall be of non-ferrous construction with smooth plate fins bonded to copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phoscopper or silver alloy. The coils shall be pressure tested at the factory. A condensate pan and drain shall be provided under the coil. The unit electrical power shall be 208 volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts.

F. Control System: The control system shall consist of two (2) microprocessors interconnected by a single non polar two wire cable as supplied. Wiring shall run from indoor unit to controller direct. NO SPLICES. When running longer lengths or more than one (1) set of remote controller wires together, a double insulated, two wire cable equivalent to that provided e.g. Belden 9407 cable, is mandatory or use shielded two-wire cable. One (1) microprocessor shall be factory wired and located within the indoor unit. It shall have the capability of sensing return air temperature and indoor coil temperature; receive and process commands from the remote controller; provide emergency operation; and control the outdoor unit. The microprocessor within the wall mounted remote controller shall provide automatic cooling; display setpoint and room temperature; a 24 hour on/off timer so that automatic operation can be set on the timer at one (1) hour intervals from one to twenty-four hours; have self-diagnostic function display; check mode for memory of most recent problem; control system shall have control continued operation of the air sweep louvers; and provide on-off and system/mode function switching. Normal operation of the remote controller provides individual system control in which one (1) remote controller and one (1) indoor unit are installed in the same room. The remote controller shall have the capability of controlling up to a maximum of fifty (50) systems at a maximum developed control cable distance of 1,650 feet. The control voltage between the remote controller and the indoor unit shall be 12 volts D.C. The control voltage between the indoor unit and the outdoor unit shall be 12 volts D.C. Both 12VDC shall be generated from the indoor unit microprocessor board. The system shall be capable of automatic restart when power is restored after power interruption. System shall include twenty (20) function self-diagnostics including total hours of compressor run time.

G. Outdoor Unit: The outdoor unit shall be completely factory assembled, piped and wired. The casing shall be fabricated of galvanized steel, bonderized and finished with baked enamel. The unit shall be furnished with one (1) direct drive, propeller type fan arranged for horizontal discharge. The motors shall have inherent protection, be of the permanently lubricated type and resiliently mounted for quiet operation. The fans shall be provided with a raised guard to prevent contact with moving parts. The compressor shall be of the high performance rotary type with crankcase heater, accumulator and internal thermal overloads. The compressor shall be mounted so as to avoid the transmission of vibration. The refrigeration system shall be equipped with high pressure switch and have the capability to operate with a maximum height difference of 100 feet and overall refrigerant tubing length of 100 feet between indoor and outdoor sections without the need for line size changes, traps or additional oil. Refrigerant flow from the condenser to be controlled by means of a capillary tube. The condenser coil shall be of non-ferrous construction with smooth plate fins bonded to copper tubing. The coil shall be protected with smooth plate fins bonded to copper tubing. The coil shall be protected with an integral metal guard. The unit shall be controlled by the microprocessor located in the indoor matching unit. A built-in, low ambient controller will allow cooling to 0 degrees F outdoor temperature. The unit electrical power shall be 208/230 volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts.

H. Wind Baffle: To allow cooling operation in temperature down to zero degrees Fahrenheit, a wind baffle must be installed onto the condensing unit.

I. Electrical Wiring: Provide all electrical circuits in conformance with NFPA 70 and color coded for ease in field tracing.

J. Provide five (5) year parts and labor warranty for A/C condensing units.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL CONTROL AIR CONDITIONING UNIT INSTALLATION

A. General: Install environmental control air conditioning units where indicated on the drawings in accordance with equipment manufacturer's published installation instructions.

B. Access: Provide access space around environmental control air conditioning units for service as indicated on the drawings, but in no case less than that recommended by the manufacturer.

C. Electrical Wiring: Install electrical devices furnished by manufacturer but specified to be factory-mounted. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-26 sections.

D. Refrigerant Piping: Provide field installed refrigerant piping in accordance with Division-23 section, "Refrigerant Piping."

1. Field installed refrigerant piping shall be refrigerant grade, Type L seamless copper tubing.

2. All connections and joints shall be silver soldered or brazed.

3. Pipe sizing and installation details shown on drawings shall be verified by the manufacturer. Piping shall be installed in strict accordance with manufacturer's recommendations regarding sizing and installation details.

E. Piping Connections: Provide piping, valves, accessories, gauges, supports, and flexible connections as indicated on the drawings.

3.2 START-UP

A. General: Start and adjust all units installed under this specification under the supervision of an authorized factory trained representative of the manufacturer of each unit. Perform operational checks to make certain that controls and safety devices and systems are operating properly. If defects or improper adjustments are found, they shall be corrected and tests repeated.

1. An operational check shall be made to demonstrate compliance with contract requirements, including but not limited to, capacity and control accuracy.

2. A report signed by each factory representative shall be submitted showing test conditions and results.

END OF SECTION 238119

SECTION 260100 – BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 CONTRACT DOCUMENTS

A. Unless otherwise modified, provisions of General Conditions, Supplementary Conditions and Division-01 govern work under the Electrical Divisions.

B. The drawings and specifications shall be followed in layout of work.

C. The Architectural drawings shall be used for all dimensional information. Do not scale from the Electrical drawings.

D. Contract Document Interpretation/Discrepancies:

1. Should the Contractor discover any discrepancies or omissions on the drawings or in the specifications, he shall notify the Architect/Engineer (A/E) of such conditions prior to the bid date. Otherwise, it will be understood that the drawings and specifications are clear as to what is intended and shall be as interpreted by the A/E.

2. In addition, should any contradiction, ambiguity, inconsistency, discrepancy or conflict appear in or between any of the Contract Documents, the Contractor, shall, before proceeding with the work in question, notify the A/E and request an interpretation. In no case shall he proceed with the affected work until advised by the A/E.

3. If the Contractor fails to make a request for interpretation of discrepancies or conflicts in the drawings or specifications, no excuse will be accepted for failure to carry out the work in a satisfactory manner, as interpreted by the A/E. In all cases, the Contractor will be deemed to have estimated the most stringent materials and methods (i.e. the highest quality materials and most expensive manner of completing the work) unless he has requested and obtained written authorization as to which methods or materials will be required.

4. Each and every trade or subcontractor will be deemed to have familiarized himself with all drawings of this project, including Site/Civil, Architectural, Structural, Mechanical, Electrical, Information Technology, etc. so as to avoid coordination errors, omissions, and misinterpretations. No additional compensation will be authorized for alleged errors, omissions, and misinterpretation, whether they are a result of failure to observe these requirements or not.

5. The complete set of Architectural, Mechanical, and Electrical drawings, specifications, and addenda apply to this work.

1.02 DESCRIPTION

A. Unless otherwise modified in other Sections, or on the contract drawings, which define the scope and arrangement of the electrical work to be provided, the applicable provisions of these General Requirements shall govern the furnishing of all supervision, labor, equipment, tools, services, and materials necessary to install a complete electrical system ready for continuous and successful operation. The work shall include, but not be limited to, the furnishing and installation of the following items, as applicable:

1. Coordination of disconnection and reconnection of incoming service conductors with PEPCO.
2. Back feeding existing panelboards.
3. New panelboard and feeders.
4. Overcurrent devices installed within existing panelboards.
5. Branch circuit conduit and wiring for wiring devices, Telecom and mechanical equipment.
6. Fire alarm system.
7. Emergency power inverter and UPS.
8. Computer Management Information, Security, and Emergency Power Systems, including raceways, wiring and outlets, meeting the requirements of and coordination with the associated companies and the applicable sections of these specifications.

B. Provide seals for all openings through smoke and fire-rated walls, floors, or ceilings used as passage for electrical conduits and cables per the smoke and fire stopping requirements in this section. This applies to both new and existing penetrations.

1.03 PERMITS, INSPECTION AND CERTIFICATION

A. Permits: Refer to the General Conditions of the Contract.

B. Certifications:

1. Certificates of final inspection and approval required by agencies or authorities having jurisdiction shall cover all electrical work.
2. All certificates of final inspection and approval shall be delivered to the College prior to final acceptance of the electrical work.

1.04 CODES, STANDARDS AND REFERENCES

A. The electrical work covered under the specifications and drawings shall be performed in strict accordance with the latest adopted edition of the following codes and standards:

1. National Electrical Code (NEC), NFPA 70
2. Applicable codes and standards of the National Fire Protection Association (NFPA)
3. National Electrical Safety Code, ANSI C2
4. International Building Code (IBC)
5. All authorities having jurisdiction

B. The work covered under the specifications and drawings shall be performed using the following references as minimum standards for construction and testing:

1. American National Standard Institute (ANSI)
2. National Electrical Manufacturers' Association (NEMA)
3. Underwriter's Laboratories (UL)
4. The Occupational Safety and Health Act (OSHA)
5. InterNational Electrical Testing Association (NETA)
6. Applicable standards of the utility company and the telephone company
7. American Society of Testing Materials (ASTM)
8. Institute of Electrical and Electronic Engineers (IEEE)
9. Insulated Cable Engineers Association (ICEA)

C. Electrical construction materials shall, where a listing is normal for the particular class of material, be listed in "Electrical Construction Material List" of the Underwriter's Laboratories, Inc. (UL) and shall bear the listing label. Electrical equipment shall, where a listing is normal for the particular class of equipment, be listed in the "Electrical Appliance and Utilization Equipment List" of the Underwriter's Laboratories, Inc. (UL) and shall bear the listing label. Materials and equipment listed and labeled as "approved for the purpose" by a Nationally Recognized Testing Laboratory (NRTL), inspection agency or approved organization shall be acceptable.

1.05 CONTRACT DOCUMENTS AND REFERENCES

A. The drawings and specifications shall be followed in layout of work.

1.06 CLARIFICATION OF DRAWINGS

A. Should a bidder find discrepancies in or omissions from the drawings or specifications, or should he be in doubt in regard to their intent, the Contractor shall notify the College before submitting bid proposal. The College shall then send written instructions to all bidders.

1.07 SUBMITTALS, REVIEW AND ACCEPTANCE

A. Complete shop drawings and material lists shall be submitted by the Contractor for review by the College in accordance with the requirements of the GENERAL PROVISIONS. Equipment and materials for which shop drawings are not submitted shall be provided as specified, and other manufacturers and products will not be allowed. No work shall be fabricated or ordered by the Contractor until approval has been given by the College.

B. Complete shop drawings showing dimensions, materials, arrangements, and other pertinent data shall be submitted.

C. Complete lists of materials and equipment shall be submitted. Full description catalog or other data shall be submitted.

D. Shop drawings and material lists shall be submitted for, but not limited to the following:

1. Panelboards

2. Conduit
3. Wire
4. Boxes and Fittings
5. Wiring Devices
6. Disconnect switches
7. Surface Metal Raceways
8. Fire Alarm System
9. Branch Circuit Breakers
10. As elsewhere indicated on the drawings or in the specifications.

E. Submittals shall include but not be limited to the following information: Size, type, functional characteristics, compliance with standards, required service access which shall be suitable for intended location and use, electrical service connections and requirements, and deviations from Contract Document requirements.

F. Shop drawings shall include plans, elevations, sections, mounting details of component parts, point to point interconnection diagrams, elementary diagrams, single line diagrams, and any other drawings necessary to show the fabrication and connection of the complete item or system.

G. Submit shop drawings and/or diagrams for all specially fabricated items, modifications to standard items, specially designed systems where detailed design is not shown on the contract drawings or where the proposed installation differs from that shown on the contract drawings.

H. Submittals shall include Riser Diagrams and Schematic Wiring Diagrams, complete conduit and wire requirements, outlet and junction box sizes and power requirements, for the following systems:

1. Fire Alarm Systems
2. Computer/Data Transmission Systems
3. As indicated elsewhere on the drawings or specifications.

I. Prepare and stamp each submittal in a form indicating that the documents have been contractor reviewed, are complete and are in compliance with the requirements of these contract drawings and specifications.

J. In general, catalog cuts, specification sheets, descriptive data, etc., shall be acceptable for submittal of all equipment specified by standard catalog numbers, unless otherwise noted in the construction documents.

K. Shop drawings shall be clearly legible; poor reproductions or reduced photographic copies that are not legible shall be rejected.

L. Before submission of shop drawings the Contractor shall carefully check same for proper capacity, operating characteristics, physical arrangement accessories, etc., as specified or noted on drawings. If shop drawings are submitted and indicate little or no prior checking by the Contractor, they shall be rejected.

M. Review Period: BKM shall be allotted two (2) weeks for the processing, review and return of all submittals. It shall be incumbent upon the Contractor to include this time period in their schedule.

1. Resubmittals: BKM shall be allotted an additional two weeks (14 days) for the review of each resubmittal. Again, it shall be the Contractor's responsibility to submit the appropriate materials in a timely fashion.
2. Contact Extension: No extension in contract time will be authorized as a result of the timeline addressed above.

N. Submittal Identifications:

1. Place a permanent label or title block on each submittal for identification.
2. Indicate name of firm or entity that prepared each submittal on label or title block.
3. Provide a space approximately 4 by 5 inches on label or beside title block to record contractor's review and approval markings and action taken by College.
4. Include the following information on label for processing and recording action taken:

    a. Project name
    b. Date
    c. Name and address of Engineer
    d. Name and address of contractor
    e. Name and address of subcontractor
    f. Name and address of supplier
    g. Name of manufacturer
    h. Unique identifier, including revision number
    i. Number and title of appropriate specification section
    j. Drawing number and detail references, as appropriate
    k. Other necessary identification
    l. Example: 262416-01-0

        - 262416 references the spec section
        - 01 indicates this is the first submittal from this spec section
        - 0 indicates this is the original submittal (where 1 would indicate this is the first re-submittal)

O. Submittals not in compliance with the requirements of this section will be returned without review.

P. Submittals will be checked only for general conformance with the design concept and are subject to the original contract documents, as well as any corrections and comments noted. Comments noted, if any, will not be considered a complete list of all omissions, deviations and corrections necessary to meet the requirements of the contract documents. The contractor will be responsible to confirm that the final product and installation will be in conformance with the contract documents in their entirety, including the responsibility to fully coordinate all work with other trades and to confirm the correctness of dimensions, quantities, and capacities. Submittal review does not authorize or constitute a change to the contract requirements and does not release the contractor of responsibility to conform to the contract requirements. Requirements of the contract are not waived by review of any and all substitutions. The contractor must fulfill the terms of the contract.

Q. Where material or equipment is identified by proprietary name, model number and/or manufacturer, furnish the named item, or equivalent, subject to acceptance. Suitability of only the named item has been verified. Where more than one item is named, only the first named item has been verified as suitable.

R. Substituted items or items other than first named shall be equal or better in quality and performance and must be suitable for the available space, required arrangement and application. Submit any and all data necessary to determine the suitability of substituted items. Substitutions must be submitted for consideration seven (7) days prior to the original bid date. Consideration of substitutions shall be at the sole discretion of the College. Substitution submittals shall include all information required in the “Submittals” sub-section of this specification section, as well as all other requirements indicated throughout the Division-26 specifications.

S. Substitutions will not be permitted for specific items of material or equipment where specifically noted.

T. Compliance Review Form: Each equipment submittal must include a Compliance Review Form formatted as follows:

1. Section 1: Certify that the submittal is in complete compliance with the plans and specifications, except for the numbered and footnoted deviations and exceptions as defined herein. Deviations or exceptions taken in a cover letter or by contradiction or omission shall not constitute a release from the requirement that the equipment be in complete compliance with the plans and specifications.
2. Section 2: Provide a detailed paragraph by paragraph annotation of the specification with an individual “C”, “D”, or “E” noted in the margin, as follows:

    a. “C” shall mean compliance with no exceptions. Provide a numbered footnote (i.e. C1, C2, C3, etc.) for each comment or clarification.
    b. “D” shall mean compliance with deviations. For each deviation, provide a numbered footnote (i.e. D1, D2, D3, etc.) with a detailed explanation of how the intent of this specification is to be satisfied.
    c. “E” shall mean exception. The equipment offered is not in compliance with the specifications. For each exception, provide a numbered footnote (i.e. E1, E2, E3, etc.) with a detailed description of the exception.

U. Electronic Submittals: Should the contractor elect to submit electronic shop drawings/submittals, the procedure shall be as follows:

1. Provide a transmittal with the electronic shop drawing/submittal indicating that the document was transmitted electronically. Transmittal shall also include verification of the contractor’s review indicating compliance with the contract documents.
2. Sequentially number all pages on the electronic shop drawing/submittal. The total number of pages shall be reflected in the transmittal.

3. Submittal review comments shall be transmitted electronically. Large documents will be scanned with comments as necessary and returned electronically.
4. All shop drawings such as, but not limited to: coordination drawings, ductwork shop drawings, fire alarm drawings, ductbank layouts, etc. shall be submitted in hard copy, full size format.
5. Provide hard copy of the shop drawing/submittal for each of the Operations and Maintenance Manuals.
6. Failure to comply with the above will result in the submittal being returned and marked “Not Reviewed”.

V. The engineer will provide a maximum of two (2) submittal reviews per equipment submittal; the initial review plus one (1) re-submittal. Should the re-submittal be returned “Not Acceptable” or “Revise and Resubmit”, the contractor shall choose one of the following courses of action:

1. Provide the exact manufacturer and model indicated in the contract documents as the basis of design, or
2. Reimburse the engineer for all additional review time required to achieve a submittal review from the engineer of “No Exceptions Taken.”
3. Should the contractor choose option 2 above, the engineer shall be reimbursed at an hourly rate of $175 per hour with payment due prior to the return of the final submittal. In addition, the contractor shall accept complete responsibility for all delays resulting from the submittal review process extending beyond two (2) reviews per equipment submittal.

W. Resubmittals: Resubmittals shall comply with paragraph 1.07 of this section and the following additional requirements.

1. Resubmittals shall include a written response to each submittal comment. Provide a detailed comment by comment annotation of the submittal review comments with an individual “C”, “D”, or “E” as follows:

a. “C” shall mean compliance with no exceptions. Provide a numbered footnote (i.e. C1, C2, C3, etc.) for each comment or clarification.
b. “D” shall mean compliance with deviations. For each deviation, provide a numbered footnote (i.e. D1, D2, D3, etc.) with a detailed explanation of how the intent of this specification is to be satisfied.
c. “E” shall mean exception. The equipment offered is not in compliance with the specifications. For each exception, provide a numbered footnote (i.e. E1, E2, E3, etc.) with a detailed description of the exception.

1.08 RECORD DOCUMENTS

A. The Contractor shall maintain a record set of electrical prints at the project site and shall indicate thereon any changes made to the contract drawings, including, but not limited to addenda, field sketches, RFI responses, supplemental drawings, sketches, etc. Where changes are made that are

reflective of supplemental instructions, revisions, RFI responses, etc., the Contractor shall make clear references to those changes.

B. A separate set of neat, legible electrical contract prints shall be kept at the project site at all times during the construction of the work for the express purpose of showing any and all changes indicated in paragraph A. above. The prints shall be marked up daily showing all changes to the original documents. The prints shall be marked up in a neat, legible manner using a red pen. Periodic review of the Record Documents will be conducted by the College Project Manager or Engineer. Should this review indicate that the Record Documents are deficient or not up to date, the Contractor shall immediately bring the documents into compliance and make the corrections

C. Upon completion of the project and before final close-out, the Contractor shall be responsible for producing a final set of record documents in electronic CADD format. One (1) set of full size prints, one (1) CD of the electronic CADD drawings (in AutoCad and pdf format), along with the red-lined marked up field set shall be delivered to the owner upon completion. If requested, the electronic CADD documents shall be up-loaded to the owner's FTP site. The final CADD documents shall indicate in the title or revision block "RECORD DOCUMENTS" along with the date completed. The electronic format shall be compatible with the owner's preferred version of AutoCad. Coordinate with the owner before producing the CD or up-loading to the FTP site.

D. Computer (CADD) files of electrical drawings will be made available to the Contractor upon receipt of a signed waiver (available upon request). One CD will be made available to the general contractor or construction manager for distribution to the trades.

E. Should the Contractor's electronic Record Documents not be considered complete, they will be returned for completion and/or correction.

1.09 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. Upon completion of all work, the Contractor shall thoroughly instruct the College Project Managers in the proper operation and maintenance of all electrical equipment and systems. Instructions shall be done only after completed systems have been put into operation and tested for proper operation and performance. Instructions shall be given only by experts in the equipment or systems and shall include descriptions and demonstrations for procedures of operation, data record keeping, etc.

B. The Contractor shall demonstrate, by actual usage, the proper operation of each and all portions of the various systems to the Owner or his appointed representative. Additional instructional periods shall be provided as required elsewhere in these specifications.

C. Following completion of the Electrical Contract and prior to the instructional period and final acceptance of the contract, the Contractor shall prepare three (3) Operating and Maintenance Manuals describing the electrical systems and equipment. Data in the manuals shall include, but not be limited to, the following:

1. Test results for all testing conducted in accordance with Division-26 Section, "Inspections, Testing and Start-up".
2. List of materials and equipment with name and address of vendor.

3. List of fuses (style and ampere rating) and other expendable equipment and devices with type, size or ordering description with name and address of vendor.
4. Operating, maintenance, and installation instructions for all systems and components with name and address of vendor and servicing supplier.
5. A certificate of approval from the Authority Having Jurisdiction and Electrical Inspector.
6. Final copies of shop drawings and submittals.
7. Manufacturer's guarantees and warranties.

D. Manuals shall be of the loose leaf type, in heavy duty binders, with a master index and dividers with plastic tabs indicating system and equipment described.

1.10 RISER PLAQUE

A. Provide a computer generated riser diagram, 24" x 36" (600 mm x 900 mm) (nominal), of the completed distribution system showing incoming services, switchboard, feeders, transformers, panelboards and related equipment. All feeders and circuits shall be sized and all equipment identified. Drawing shall be framed with plexiglass overlay and shall be installed in the electric room at the location directed by owner in the field.

1.11 GUARANTEE

A. Guarantee obligations shall be as specified in the GENERAL PROVISIONS of these specifications, except as follows:

1. Guarantee the complete electrical system free from all mechanical and electrical defects for a period of two (2) years beginning from the day of final acceptance of the work for all buildings.
2. During the guarantee period, the Contractor shall be responsible for the proper adjustments of all systems, equipment and apparatus installed by him and do work necessary to insure efficient and proper functioning of the systems and equipment.
3. Upon receipt of notice from the Owner of failure of any part of the electrical installation during the guarantee period, new replacement parts shall be furnished and installed promptly at no cost.
4. Within the two (2) year warranty/guarantee period, manufacturer’s recommended maintenance shall be provided by the Contractor.

1.12 DEFINITIONS

A. The following definitions apply to firestopping:

1. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
2. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
3. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire, gases and smoke.

4. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.
5. Construction Gaps: Gaps between adjacent sections of walls, exterior walls, at wall tops between top of wall and ceiling, and structural floors or roof decks; and gaps between adjacent sections of structural floors.
6. System: Specific products and applications classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.
7. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

PART 2 - PRODUCTS

2.01 MATERIAL AND EQUIPMENT

A. All materials and equipment shall be new, the best of their respective kinds and suitable for the conditions and duties imposed on them. Replacement parts shall be available. A permanent service organization maintained or trained by the manufacturer shall be available for service.

B. The Contractor shall set-in place and connect all electrical equipment furnished under Division-26 and all other Divisions of the Contract.

C. Verify exact electrical service requirements for each piece of equipment receiving electrical connections. Provide proper service for each.

D. Include any and all items required by the National Electrical Code and field conditions for the proper connection and installation of each piece of equipment.

E. Products of one manufacturer shall be used where two or more items of the same kind are required.

2.02 EQUIPMENT DEVIATIONS

A. The Contractor shall be governed by the requirements of the GENERAL PROVISIONS of these specifications. After an item has been approved, no substitution will be permitted except where such substitution is considered by the Engineer to be in the best interest of the Owner.

B. The Contractor shall notify the Engineer of any changes in electrical characteristics of equipment being installed as opposed to that specified.

C. Where the Contractor proposes to use an item of equipment other than that specified or detailed on the drawings, which requires any redesign of the structure, partitions, foundations, piping, ductwork, wiring, or any other part of the mechanical, electrical, or architectural layout, all such redesign, and all new drawings, and detailing required shall, with the approval of the Engineer, be prepared by the Contractor at the Contractor's own expense.

D. Where such approved deviation requires a different quantity and arrangement of ductwork, piping, wiring, conduit, and equipment from that specified or indicated on the drawings, with the approval of the Engineer, the Contractor shall furnish and install such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

2.03 FIRESTOPPING

A. All penetrations through fire barriers shall be firestopped with an approved material that is capable of maintaining the fire resistance rating of the barrier. All firestop sealants shall conform to ASTM E 814, ASTM E 119, UL 1479, UL 2079 CAN/ULC S115, and CAN/ULC S101.

B. Firestop material shall be latex based, intumescent caulk intended for use for all thru-penetrations with piping, ducts, cable trays, conduit, and cables. \

C. When exposed to high temperatures or fires, the caulk shall expand in volume to quickly close off voids left by melting or burning construction materials. Caulk shall be applied by a standard caulk gun and remain flexible after curing.

D. Acceptable products shall be limited to Johns Manville “Firetemp-C1;” Hilti “FS-One;” or 3M “CP25WB+.” Coordinate with General Contractor such that a single manufacturer/product is utilized throughout the project for all fire and smoke stopping materials.

2.04 SMOKE STOPPING

A. All penetrations through smoke barriers, smoke partitions, or any other surface required to resist the passage of smoke shall be provided with a smoke stop sealant and/or system that has been independently tested to provide an acceptable smoke seal that will resist the passage of smoke. Smoke stop systems (including product and installation) shall conform to all applicable standards (including but not limited to ASTM, UL and NFPA), as well as all other local, state or federal requirements.

B. Acceptable manufacturers shall be limited to the manufacturers that may provide firestopping materials/systems (see paragraph 2.03 of this section). Coordinate with the General Contractor such that a single manufacturer/product is utilized throughout the project for all fire and smoke stopping materials.

PART 3 - EXECUTION

3.01 SUPERVISION AND COORDINATION

A. The Contractor shall have competent supervision on the site at all times to layout, check, coordinate and supervise the installation of all electrical work and be responsible for the accuracy thereof. He shall plan the installation of all electrical work, giving consideration to the work of other trades, to prevent interference.

B. Determine the location, size, etc. of all chases, sleeve openings, etc. required for the proper installation of the electrical work and see that such are provided. All chases, sleeves, openings, etc. shall be set prior to erection of new work to prevent delay in the progress of other work or trades.

C. Conditions and/or situations which prevent the proper installation of any equipment or item where shown on the drawings shall be called to the attention of the Engineer for instructions.

D. Equipment shall be shipped or fabricated in sections of suitable size for entering the building and being removed from the finished building in the future if necessary.

E. Fully investigate all peculiarities and space limitations for all materials and equipment.

F. Outlet, pull and junction boxes and appliances which require operation, examination, adjustment, servicing or maintenance shall be readily accessible.

G. Take all field measurements necessary for this work and assume responsibility for their accuracy.

H. Coordinate the electrical work with all sub-contractors. All work shall be so arranged that there will be no delay in the proper installation and completion of any part or parts of electrical equipment. All electrical work shall be installed in proper sequence with other trades without any unnecessary delay.

I. Make all sub-contractors, suppliers and manufacturers fully aware of all requirements of the Contract.

J. Coordinate the spacing and arrangement of access panels with existing lighting fixtures, diffusers and grilles and in ceilings to establish a symmetrical pattern. Unless otherwise indicated, items in modular ceiling systems shall be centered in individual tiles.

K. Coordinate the rough-in of all electrical work performed under other Divisions of these specifications.

L. Drawings indicate the approximate locations of outlets, apparatus and equipment. The runs of feeders and branch circuits as shown are schematic. Final routing is governed by structural conditions and other obstructions. This does not mean that the design may be changed; it merely refers to the exact run of a raceway between given points.

M. The drawings are diagrammatic and indicate the general arrangement of the equipment, the runs of conduit and the manner of connection.

N. The architectural, mechanical, as well as the electrical drawings, shall be consulted in order to be entirely familiar with conditions to be encountered and special details.

O. The Contractor shall be solely responsible for the proper arrangement of conduit.

P. The Engineer shall make all final decisions as to any conditions which require the changing of any work.

3.02 STORAGE AND PROTECTION OF EQUIPMENT AND WORK

A. All materials and equipment shall be properly and effectively protected by the Contractor during the execution of the work.

B. Conventional electrical construction materials such as building wire, outlet and junction boxes, wiring devices, conduit, fittings, etc., shall be stored in construction buildings, covered trailers or portable covered warehouses. Any equipment subject to damage or corrosion from excessive moisture shall be stored in dry, heated areas. Any equipment containing plastic or material subject to damage caused by excessive heat or sunlight shall be stored to prevent such damage.

C. All gear and equipment delivered to the construction site shall be protected as described above and in addition shall be provided with auxiliary heat to prevent condensation damage. The gear shall also be protected against damage caused by carelessness of workmen who are installing equipment connected to or adjacent to the above electrical equipment.

D. Equipment damaged as a result of the above conditions shall be properly repaired at the Contractor's expense or shall be replaced at the Contractor's expense, if, in the opinion of the Engineer the equipment has been damaged to such an extent it cannot operate properly after repairs are made.

E. All electrical enclosures exposed to construction damages such as paint spots, spackling or plaster spatter, grout splashes, waterproofing compound, tar spots or runs and pipe covering compound splashes, shall be completely covered and protected against damage.

F. In the event leakage into the building of any foreign material or fluid occurs or may occur, the Contractor shall take all steps as described above to protect any and all equipment.

G. After connections to electrical equipment are complete and the equipment is ready for operation, all construction debris shall be removed from all

enclosures. Such debris includes dust, dirt, wire clippings, tape and insulation removed in order to make connections.

3.03 CUTTING AND PATCHING

A. All cutting of walls, floors, roofs, ceilings and/or partitions for the passage of conduit, etc., and closing up of superfluous openings around them in connection with the work under this contract, including the removal of all debris caused thereby, shall be performed by the Contractor.

B. All cutting, patching and finishing shall be performed in accordance with the requirements of the respective division of the specification and shall conform to adjacent work, subject to the approval of the Engineer.

C. Any work already in place that has been disturbed in the execution of the work shall be repaired and restored in harmony with the surrounding work.

D. Do not cut structural members without approval of the Engineer.

E. Patching shall be uniform in appearance and shall match with the surrounding surface.

3.04 PENETRATION OF WATERPROOF AND FIREPROOF CONSTRUCTION

A. Coordinate the work to minimize penetration of waterproof construction including roofs, exterior walls and interior waterproof construction. Where such penetrations are necessary, provide all necessary curbs, sleeves, shields, flashings, pitch pockets, fittings and caulking to make the penetrations absolutely watertight.

B. Where waterproofing or fireproofing have been removed or damaged in the execution of the work, the Contractor shall have such damage repaired by the respective trades working on the project.

C. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer’s instruction.

D. Seal holes or voids made by penetrations to ensure an effective smoke barrier.

E. Slots, sleeves and other penetrations in floors, wall or other general construction shall be closed and sealed with an approved firestopping material.

F. Floor slots and openings shall be closed with 16 gauge (1.6 mm) galvanized steel sheet supported on 1-inch by 1-inch by 1/8-inch (25 mm by 25 mm by 3 mm) structural angle drilled or supported with powder-driven studs into the building structure. Firestop with a layer of firestopping material not less than 1-inch (25 mm) thick which completely fills the opening. The top surface of the firestopping material shall be approximately 1-inch (25 mm) below the finished floor slab.

G. Openings in walls shall be closed with 16 gauge (1.6 mm) galvanized steel sheet securely attached at the midpoint of the wall thickness and firestopped

on both sides of the steel sheet with not less than 1/2-inch (13 mm) thick layer of non-sagging firestopping material to fully cover the opening.

H. Single or multiple pipes passing through walls and floors shall have the annulus space between pipes or between pipes and structure filled with firestopping material to provide a fire rating equal to the rating of the floors and walls being penetrated. The annulus between exposed conduit and walls or floors in finished spaces shall be filled, sealed, and painted to match adjacent surfaces.

I. In fire-rated partitions where horizontal separation of opposite-facing electrical boxes is less than 24 inches, provide UL listed firestop around electrical boxes as required to maintain fire rating of wall.

3.05 MANNER OF INSTALLATION

A. Provide equipment supports consisting of structural racks, hangers, rods, etc.

B. Equipment supports shall be designed and constructed to safely support and distribute loads evenly over building areas, and withstand stresses to which they may be subjected.

C. Provide finish metal access doors and frames as required for access to concealed electrical equipment requiring inspection, adjustment, maintenance, manual operation, etc., or required by code.

D. Provide finish metal access doors and frames as indicated or required for access to concealed electrical equipment requiring inspection, adjustment, maintenance, manual operation, etc., or required by code.

E. In suspended metal pan, lay-in-panel, and accessible tile ceilings, the ceiling element may be used as the access panel.

F. Access doors in 1-1/2 hour fire-rated construction shall bear the Underwriter's Laboratories "B" label.

G. Floor-mounted equipment (inverter, etc.) shall be provided with concrete foundations.

H. Concrete foundations shall be reinforced to suit the loads placed on them and shall be in strict accordance with the equipment manufacturer's recommendations. Concrete materials and methods shall be as specified in Division-3 of these specifications. The Contractor shall refer to this Division to determine specific requirements.

I. Unless otherwise indicated or required, concrete foundations shall extend 4-inches (100 mm) above the finished floor, at least 3-inches (75 mm) beyond the equipment base in all directions, shall have the top edges chamfered 1" (25 mm) and shall have the same surface finish as the adjacent and surrounding floor. Where equipment weight is such that the floor slab will support the equipment the concrete foundations shall be securely anchored to the floor slab with steel dowels. Properly prepare existing floors: remove paint or dirt, clean and scarify as necessary.

J. The Contractor shall furnish and set, with proper templates, all anchor bolts and inserts required for the proper attachment of his equipment to the concrete foundations. Anchor bolts shall be of the size and number required by the equipment and/or recommended by the equipment manufacturer and shall be in accordance with the requirements detailed on the drawings and/or specified herein. Anchor bolts shall also be compatible where applicable, with vibration isolation requirements specified for the equipment. Anchor bolts shall be of adequate size and shall engage a steel plate of adequate dimensions cast into the slab. Where existing slabs are being extended, the slab extension shall be doweled into the existing slab to ensure it does not separate.

K. The drawings indicate the wiring method. The number of current carrying conductors per raceway or cable shall be as indicated. The number of current carrying conductors cannot exceed three (3) per raceway or cable, unless the ampacity adjustment factors of NEC Article 310 are applied.

L. Each new and existing electrical penetration through a smoke and fire-rated wall, ceiling, or floor shall be sealed with an approved smoke and fire stopping method coordinated with the rating of the associated wall, ceiling, or floor construction.

3.06 CLEANING AND PAINTING

A. All equipment and conduit shall be thoroughly cleaned of all cutting waste from reaming and tapping. All burrs and other foreign matter shall be removed. Should any part of the system be stopped up by such refuse after the various equipment and apparatus have been accepted, the Contractor shall be required to pay for all labor and materials required to locate and remove the obstruction, and replace and repair all work in any way disturbed thereby. All enclosures, etc., shall be cleaned of all rubbish, plaster, and other debris at the completion of the work.

B. Paint all exposed metal surfaces, except for galvanized surfaces of all electrical equipment in mechanical rooms and equipment spaces.

C. Do not paint nameplates or other elements where such application would interfere with operation or maintenance of equipment.

D. All scratches or marred areas on factory painted equipment shall be touched up to match finish.

3.07 IDENTIFICATION

A. Equipment (disconnects, panelboards, etc.) shall be identified as to its function, equipment, or area served, etc. In finished areas and mechanical rooms and equipment spaces identification shall be engraved phenolic plates with approximate 3/16" (5 mm) high black letters on white background. Plates shall be attached to front of devices with stainless steel, oval head, machine screws. Panelboards and equipment cabinets shall also be identified with stenciled letters, 3/4" (19 mm) high, on inside of cabinet door, colored to contrast with background.

B. All conduits containing electrical feeders shall be identified with vinyl cloth pipe markers by W.H. Brady or Seton. Labels shall be applied whenever a conduit enters or leaves a switchboard, panelboard, or a junction or pull box, and at each side of penetrations of walls or floors. Provide individual numbers and letters to indicate feeder number and voltage.

C. All pull box and junction box covers shall be stenciled to indicate voltage, service and/or system. All stenciling shall be clear and legible from a distance of five (5) feet.

D. No embossed plastic tape markers will be permitted for use in marking equipment.

E. Receptacle Cover Plates: Provide label on front of cover plate unless otherwise noted. Label shall indicate source panel and circuit number. Label shall be a laminated, adhesive backed, peel-off, polyester type label. Label shall be comprised of a polyester base/substrate and a clear polyester top layer/laminate. The label ink shall be printed underneath the clear polyester laminate. Label shall have black lettering on clear background. Label width shall be a nominal 0.47” (12 mm) wide. Basis of design is the TZe labeling tape by Brother Mobile Solutions, Inc. For use with the Brother P-Touch EDGE Series labeling tools.

F. All identification shall be subject to the approval of the Engineer.

3.08 EXAMINATION OF SITE

A. The Contractor shall examine the premises prior to submitting his bid and observe the conditions under which the work will be done or other circumstances which will affect the contemplated work. No allowance will be made for any work in connection with any error or negligence on the Contractor's part. No claim for extra compensation will be recognized for difficulties encountered which, in the opinion of the Owner, would have been revealed by proper examination.

3.09 ELECTRICAL DEMOLITION

A. All demolition of existing electrical equipment, conduit, wiring devices, lighting fixtures, etc. shall be performed under this section of the specification. The areas of demolition are defined on the architectural drawings and specific references are made on the electrical drawings.

B. The electrical demolition in the renovation areas indicated on the drawings shall be complete and include all electrical work in the area unless noted otherwise.

C. Existing electrical systems passing through areas of demolition to serve equipment beyond the demolition areas shall remain in service, or be suitably relocated and restored to normal operation, throughout the demolition and reconstruction of the area. The Contractor shall investigate and identify such equipment prior to demolition.

D. Provide temporary electrical service to equipment disturbed by the demolition until such time as the permanent service can be restored.

E. Where conduit and wiring to remain are inadvertently damaged or disturbed, cut out and remove damaged portion and all damaged wiring from the source switchboard, panelboard or pullbox to the destination connection point. Provide new wiring of equal capacity.

F. Exposed conduit and conduit within accessible ceilings, floors and walls to be demolished shall be removed in its entirety, including all conduit, supports, junction boxes, etc. Conduit concealed within non-accessible ceilings, floors and walls abandoned in place, shall be cut flush with walls and floors, plugged, and the adjacent surface patched to match existing.

G. Wiring to be demolished shall be removed from both concealed and exposed conduit. No wiring which becomes unused as a result of the Contract shall be abandoned in place.

H. Equipment specified or indicated to be demolished, shall be removed from the project site and shall not be reused. Equipment required to be temporarily disconnected and relocated shall be carefully removed, stored, cleaned, reinstalled, reconnected and made operational.

I. All material being disposed of shall be done as required to meet the applicable environmental regulations for all local, state, and federal agencies. Examples include, but are not limited to, light fixture ballasts, fluorescent lamps, and batteries.

J. Any outages in systems shall be coordinated with the Owner. Where duration of proposed outage cannot be tolerated by the Owner, provide temporary connections as required to maintain service.

K. Disconnect abandoned outlets and remove devices and wiring back to point of use. Provide blank cover for abandoned outlets.

L. The contractor shall use care when performing selective building and site demolition. The contractor shall be responsible for damage inclusive of but not

limited to: building finishes, lighting (interior and exterior), furniture, structure, site, utilities (above and below ground), mechanical, plumbing, telecommunications and electrical equipment / systems. Should any damage occur or should any remedial work be required, the contractor shall be responsible to repair and or replace the damaged item(s) to the Owner's satisfaction at no additional cost. The contractor shall be responsible for surveying, photo documenting and restoring the surrounding work site(s) to the original pre-demolition condition and / or to the Owner's satisfaction upon completion of the work at no additional cost.

M. Repair adjacent construction and finishes damaged during demolition. Patch all holes left from demolished equipment. Paint surfaces exposed by demolition to match adjacent surfaces.

3.10 CONNECTIONS TO EXISTING WORK

A. When the work specified hereafter connects to any existing equipment, conduit, wiring, etc., the Contractor shall perform all necessary alterations, cutting, fitting, etc., of the existing work as may be necessary or required to make satisfactory connections between the new and existing work and shall leave the completed work in a finished and workmanlike condition, to the satisfaction of the Engineer.

B. When the work specified hereafter or under other Sections or Divisions of the contract necessitates relocation of existing equipment, conduit, wiring, etc., the Contractor shall perform all work and make all necessary changes to existing work as may be required to leave the completed work in a finished and workmanlike manner to the satisfaction of the Engineer.

C. The Contractor is cautioned that all existing electrical systems and life safety systems must remain in service during all phases of construction.

D. The Contractor shall work in close cooperation with the Owner for any temporary outages.

E. It is imperative that all interruptions of the electrical service and standby service be kept to an absolute minimum. The Contractor must submit a written request to the Owner for any and all interruptions of the electrical service or the standby service 72 hours in advance of the planned outage.

3.11 WORKMANSHIP

A. All materials and equipment shall be installed and completed in a first class workmanlike manner and in accordance with the best modern methods and practice. Any materials installed which do not present an orderly and reasonably neat or workmanlike appearance shall be removed and replaced when so directed by the Engineer. The removal and replacement of this work shall be done, when directed in writing by the Engineer, at the Contractor's expense.

3.12 REPAIR OF EXISTING PROPERTY

A. All work shall be carefully laid out in advance, and where cutting, channeling, chasing, trenching, or drilling of floors, walls, partitions, ceiling, or other surfaces is necessary for the proper installation, support, or anchorage of raceways, outlet boxes, or other electrical work, this work shall be carefully done, and any damage to building, piping, equipment, or ground shall be properly repaired by skilled mechanics of the trades involved, at no additional cost to the Owner.

3.13 PUNCH-OUT PROCEDURES

A. Preliminary Punch-out:

1. Prior to requesting an inspection from the Owner, Engineer, or Permit Official, the General Contractor or Construction Manager (GC or CM) shall provide a preliminary punch-out of the area in question.
2. Once completed, their punch list shall be supplied to each trade for corrections and completion. The punch list shall also be provided to the Engineer for their use.
3. Upon being informed that the trade contractors have addressed all of the outstanding items, the GC / CM shall backcheck the work and update the punch list.

B. Final Punch-out:

1. Final punch-out by the engineer shall not commence until the GC or CM has exhausted their review and has signed off on all items.
2. A copy of the sign-off shall be provided to the Engineer for their record.
3. Once the above has been completed, the Engineer shall be notified that the work is substantially complete and ready for a final punch-out.
4. Depending on the size, schedule, and project complexity, punch-outs may be requested for specific areas or systems, rather than the facility as a whole. Examples of specific requests include the following:

    a. Above ceiling

3.14 ELEVATOR CONTRACTOR

A. There are existing elevators that receive monitoring and control signals form the existing fire alarm system that will be affected by work performed as part of this project. The elevator scope of work is as follows:

1. Remove and reconnect existing elevator control and power connections connected to the fire alarm system.
2. Field verify existing conditions as required for completion of project.
3. Re-establish all existing elevator functions affected by work performed as part of this project.
4. Re-commission and demonstrate proper operation of the affected elevators for College personnel, Authority Having Jurisdiction and 3rd party inspection service.
5. Provide documentation and certification of all recommission and inspection activities.
6. Provide 3rd party inspection of elevator operation. This work shall be performed by a state authorized elevator inspection organization with experience performing work of this type and complexity. Submit qualifications for approval prior to work. The Contractor is responsible to contact this organization and to include all associated cost in the contract bid price.
7. Provide all labor, materials, tools, coordination, additional design and all incidentals to provide a complete and operable elevator system to the satisfaction of the Owner.
8. This work shall be performed by Montgomery College's current service provider with the exception of the 3rd party inspection. The Contractor is responsible to contact this organization and to include all associated cost in the contract bid price. The current Montgomery College service provider is Oracle Elevator Company. Contact Brenda Talbert, Business Development Manager at Phone: (301) 573-3452, Email: Brenda.talbert@efstream.com.

END OF SECTION 260100

SECTION 260200 – PROJECT CLOSEOUT – ELECTRICAL

PART 1 – GENERAL

1.01 SUMMARY

A. This section provides a summary of the primary electrical project closeout activities, however, this section does not attempt to address all project closeout requirements. Closeout activities referenced in this section include the following:

1. Testing
2. Start-up
3. Punch-out Procedures
4. Operation and Maintenance Manuals (O & M Manuals)
5. Demonstration and Training
6. Record Documents
7. Close-out Documents

B. This Section shall not supersede any other close-out section or requirements of the Contract. Refer to other Divisions of the specifications and the General Requirements of the Contract for further instructions.

PART 2 – PRODUCTS

Not Applicable

PART 3 – EXECUTION

3.01 TESTING

A. The Contractor shall perform systems and equipment inspections and tests as specified in each Division-28 and Division-26 specifications section. Particular attention shall be paid to Division-26 section “Inspections, Testing and Start-up.”

B. An independent testing firm shall perform systems and equipment inspections and tests as specified in each Division-26 section. Particular attention shall be paid to Division-26 section “Inspections, Testing and Start-up.”

3.02 START-UP

A. The Contractor shall perform start-up on each piece of electrical equipment as specified in each section of Division-26.

B. Where indicated in each section of Division-26, the services of a factory authorized and certified technician shall be required to perform the equipment start-up. Start-up by any other organization other than as required by the manufacturer is unacceptable.

C. Start-up reports shall be provided for all equipment and be included in the final O & M Manuals.

3.03 PUNCH-OUT PROCEDURES

A. Preliminary Punch-out:

1. Prior to requesting an inspection from the Owner, Engineer, or Permit Official, the General Contractor or Construction Manager (GC or CM) shall provide a preliminary punch-out of the area in question.
2. Once completed, their punch list shall be supplied to each trade for corrections and completion. The punch list shall also be provided to the Engineer for their use.
3. Upon being informed that the trade contractors have addressed all of the outstanding items, the GC / CM shall backcheck the work and update the punch list.

B. Final Punch-out:

1. Final punch-out by the engineer shall not commence until the GC or CM has exhausted their review and has signed off on all items.
2. A copy of the sign-off shall be provided to the Engineer for their record.
3. Once the above has been completed, the Engineer shall be notified that the work is substantially complete and ready for a final punch-out.
4. Depending on the size, schedule, and project complexity, punch-outs may be requested for specific areas or systems, rather than the facility as a whole. Examples of specific requests include the following:

    a. Above ceiling

3.04 OPERATION AND MAINTENANCE MANUALS

A. Submit Operation and Maintenance Manuals in three-ring binders with each section separated by tab dividers. Include protective plastic sleeves for any software or folded large documents submitted.

B. At a minimum, the manual shall contain the following:

1. Test results for all testing conducted in accordance with Division-26 Section, "Inspections, Testing and Start-up".
2. List of materials and equipment with name and address of vendor.
3. List of fuses (style and ampere rating) and other expendable equipment and devices with type, size or ordering description with name and address of vendor.
4. Operating, maintenance, and installation instructions for all systems and components with name and address of vendor and servicing supplier.
5. A certificate of approval from the Electrical Inspector.
6. Final copies of shop drawings and submittals.
7. Manufacturer's guarantees and warranties.

C. The O & M Manuals shall be submitted to the Engineer for review of general conformance.

3.05 DEMONSTRATION AND TRAINING

A. Upon completion of work, Simplex shall instruct the College Project Manager in the proper operation and maintenance of each electrical, fire alarm, and mass notification system in accordance with applicable specification sections.

B. Instructions shall be given by Simplex personnel expert in the operation and maintenance of each system / equipment.

C. Demonstration and training shall consist of two (2) eight (8) hour sessions on non-consecutive days. Sessions shall provide complete demonstration and training to departments, including, but not limited to, security, facilities, and information technologies. Demonstration and training sessions shall be coordinated with Owner's schedule and may need to be completed during non-business hours.

D. Prepare statement(s) for signing by College Project Manager indicating the date of completion of instructions and hours expended. Furnish copies of signed statements to the Engineer.

E. Final demonstration of all electrical, fire alarm and mass notification systems shall be recorded in DVD compatible format. Provide DVD's to the Owner.

F. Contractor and Simplex shall assist the Owner in developing "cheat sheets" with key operational instructions on what procedures should be followed for specific events. The list of events and follow-up procedures will be developed through a combined effort between the Owner, Contractor and Simplex during the demonstration and training sessions. The deliverable will be up to twelve (12) laminated 8-1/2" x 11" "cheat sheets" produced by the Contractor and Simplex, and then turned over to the Owner. Submit draft for review to Montgomery College for approval before final submission.

3.06 RECORD DOCUMENTS

A. The Contractor shall maintain a record set of electrical prints at the project site and shall indicate thereon any changes made to the contract drawings, including, but not limited to addenda, field sketches, RFI responses, supplemental drawings, sketches, etc. Where changes are made that are reflective of supplemental instructions, revisions, RFI responses, etc., the Contractor shall make clear references to those changes.

B. A separate set of neat, legible electrical contract prints shall be kept at the project site at all times during the construction of the work for the express purpose of showing any and all changes indicated in paragraph A. above. The prints shall be marked up daily showing all changes to the original documents. The prints shall be marked up in a neat, legible manner using a red pen. Periodic review of the Record Documents will be conducted by the College Project Manager or Engineer. Should this review indicate that the Record Documents are deficient or not up to date, the Contractor shall immediately bring the documents into compliance and make the corrections

C. Upon completion of the project and before final close-out, the Contractor shall be responsible for producing a final set of record documents in electronic CADD

format. One (1) set of full size prints, one (1) CD of the electronic CADD drawings (in AutoCad and pdf format), along with the red-lined marked up field set shall be delivered to the owner upon completion. If requested, the electronic CADD documents shall be up-loaded to the owner's FTP site. The final CADD documents shall indicate in the title or revision block "RECORD DOCUMENTS" along with the date completed. The electronic format shall be compatible with the owner's preferred version of AutoCad. Coordinate with the owner before producing the CD or up-loading to the FTP site.

D. Computer (CADD) files of electrical drawings will be made available to the Contractor upon receipt of a signed waiver (available upon request). One CD will be made available to the general contractor or construction manager for distribution to the trades.

E. Should the Contractor's electronic Record Documents not be considered complete, they will be returned for completion and/or correction.

3.07 CLOSEOUT DOCUMENTS

A. Prior to Substantial Completion and /or Final Payment, the Contractor shall prepare and submit the following:

1. Final punch lists indicating completion of all items.
2. All record drawings.
3. All record specifications.
4. Operation and Maintenance Manuals.
5. Complete final cleaning.
6. Remove temporary facilities and complete site restoration.
7. Laminated procedural 'cheat sheets."

END OF SECTION 260200

SECTION 260501 – INSPECTIONS, TESTING AND START-UP

PART 1 - GENERAL

1.01 DESCRIPTION

A. The intent of the inspection, testing, and check-out work specified herein is to insure that all electrical workmanship and equipment, whether Owner furnished or Contractor furnished, is installed and performs in accordance with the Contract Documents, manufacturer's instructions and all applicable codes and requirements. Also, it is intended to insure the following:

1. Equipment has not been subjected to damage during shipment or installation.
2. Equipment is in accordance with the specifications.
3. A bench mark is established for routine maintenance and troubleshooting.
4. Successful start-up without last minute interruptions and delays.
5. Each system component is installed satisfactorily and will perform its function reliably throughout the life of the plant.

B. Testing requirements in other sections of this Specification are intended to compliment and not supercede nor be superceded by this Section.

1.02 RELATED SECTIONS

A. Division-26 - Electrical Specifications.

1.03 REFERENCES

A. American National Standards Institute (ANSI)

1. ANSI C2, National Electrical Safety Code
2. ANSI Z244-1, American National Standard for Personnel Protection

B. American Society of Testing and Materials (ASTM)

C. Institute of Electrical and Electronic Engineers (IEEE)

D. Insulated Cable Engineers Association (ICEA)

E. International Electrical Testing Association (NETA)

F. National Electrical Manufacturer’s Association (NEMA)

G. National Fire Protection Association (NFPA)

1. ANSI/NFPA 70, National Electrical Code
2. ANSI/NFPA 70B, Electrical Equipment Maintenance
3. ANSI/NFPA 70E, Electrical Safety Requirements for Employee Workplaces

H. Occupational Safety and Health Administration (OSHA)

I. State and Local Codes and Ordinances

1.04 SUBMITTALS

A. Provide resumes for personnel conducting tests and evidence of their qualifications, accreditation and experience.

B. Provide a list of test equipment to be utilized including the manufacturer's name, model number, serial number, accuracy, and last date of calibration.

C. Provide industry standards or guide specifications used in lieu of National Standards.

D. Provide testing procedures and schedules.

1.05 TEST INSTRUMENT CALIBRATION

A. The contractor shall have a calibration program which assures that all applicable test instrumentation is maintained within rated accuracy.

B. The accuracy shall be directly traceable to the National Institute of Standards and Technology (NIST).

C. Instruments shall be calibrated in accordance with the following frequency schedule:

1. Field instruments, analog: six (6) months.
2. Field instruments, digital: twelve (12) months.
3. Laboratory instruments: 12 months.
4. Leased specialty equipment: 12 months.

D. Calibration labels shall be visible on all equipment and shall have a date of calibration and due date. Calibration records shall be available for review by the Owner.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 COORDINATION

A. Provide all necessary supervision and labor, materials, tools, test instruments and other equipment or services required to inspect, test, adjust, set, calibrate, functionally and operationally check all work and equipment.

B. When an independent testing firm is utilized, provide a set of contract documents to the testing firm.

C. Prepare procedures and schedules for all inspections, tests, settings and calibrations specified or otherwise required. The procedures must provide specific instructions for the checking and testing of each component in addition to the system functional checks. All procedures submitted shall include proposed job safety rules.

D. Provide a suitable and stable source of electrical power to each test site. The Owner shall approve all sources of electrical power for testing.

E. Notify the Owner prior to the commencement of any testing.

3.02 INSPECTIONS AND TESTS

A. Equipment purchased by the Contractor or purchased by the Owner but installed by the Contractor shall be inspected and tested to determine its condition.

B. The inspections, tests and checks described herein shall not be considered as complete and all inclusive. Additional normal standard construction (and sometimes repetitive) checks and tests shall be provided as necessary throughout the project, prior to final acceptance by the Owner.

C. At any stage of construction and when observed, any electrical equipment or system determined to be damaged, faulty, or requiring repairs shall be reported to the Owner. Corrective action may require prior approval.

D. The Contractor or the independent test agency shall provide visual and mechanical inspections of the following systems and equipment.

1. Panelboards
2. Circuit breakers being added to existing panelboards
3. Low voltage wiring (600 volt and below)
4. Air switches (600 volt and below)
5. Fire detection and alarm system
6. Mass notification system

E. The rotation of all motors shall be checked, and corrective action shall be taken where necessary to obtain correct rotation.

F. Engagement of an independent testing firm in no way relieves the Contractor of the responsibility for the performance of the many and varied tests, checkouts, and inspections required during the various stages of construction.

3.03 CERTIFICATION

A. Provide certified test reports. Test reports shall meet the criteria specified in OSHA Regulation Part 1907, “Accreditation of Testing Laboratories”. The certification shall attest to the fact that the electrical installation has been installed and tested in accordance with the applicable National Standards or, where no National Standard exists, the applicable industry standard or guide specification for the equipment involved.

B. The following information shall be included in the test reports.

1. Description of equipment tested (manufacturer, model number, serial number).
2. Description of test and standards used.
3. Description of test equipment.
4. Test results with pass/fail criteria.
5. Conclusions and recommendations.
6. Names of personnel conducting the test.

C. Provide three (3) copies of the complete test report no later than thirty (30) days following completion of the tests.

D. When testing is provided by an independent firm, the report shall be signed by a Registered Professional Engineer.

END OF SECTION 260501

SECTION 260519 – WIRES AND CABLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, Basic Electrical Materials and Methods, apply to this Section.

1.02 SUMMARY

A. The Contractor shall provide, install and terminate all wires and cables for power, lighting, signal, control and related systems rated 600 volts and less.

1.03 SUBMITTALS

A. Submit product data for electrical wires, cables and connectors.

1.04 QUALITY ASSURANCE

A. All wires, cables and connectors and the installation of wires, cables and connectors shall comply with the following standards:

1. NFPA 70 "National Electrical Code."
2. UL Standards pertaining to wires and cables:

    a. UL Std 44, Rubber Insulated Wires and Cables
    b. UL Std 83, Thermoplastic - Insulated Wires and Cables
    c. UL Std 486A, Wire Connectors and Soldering Lugs for Use with Copper Conductors, UL Std 486B for Use with Copper or Aluminum

3. Applicable NEMA Standards pertaining to wires and cables.
4. Applicable IEEE Standards pertaining to wires and cables.

B. Wires, cables and connectors shall be listed and labeled by UL.

PART 2 - PRODUCTS

2.01 WIRES AND CABLES

A. All wiring #14 and larger shall be soft drawn copper, 98 percent conductivity, 600 volt insulation, type THHN/THWN.

B. All wiring #8 and larger for feeders and branch circuits shall be stranded.

C. Minimum wire sizes shall be #12 for power circuits unless otherwise noted.

D. All wiring shall have identification markings along the outer covering denoting conductor size, type of insulation, and manufacturer's trade name. All wiring shall be color coded as follows:

PHASE	120/208 VOLTS
A	Black
B	Red
C	Blue
Neutral	White
Ground	Green

E. Wiring in sizes up to #8 shall have colored insulation, wiring in sizes #6 and larger shall be coded by colored tape applied no more than 6 inches (150 mm) from each termination and spanning a minimum length of 6 inches (150 mm) of insulation.

F. All emergency wiring shall be clearly identified as emergency in all outlets, fixtures, etc.

PART 3 - EXECUTION

3.01 WIRING METHODS

A. All wiring for power circuits shall be sized as follows unless otherwise indicated:

120 Volt Branch Circuit Length	Wire Size
0-75' (0-22.5 m)...	#12
75-150' (22.5-45 m)	#10
Over 150' (Over 45 m)	# 8

In accordance with the above where the size of branch circuit conductors is increased by the minimum required by the NEC for the branch circuit rating, it is the Contractor's responsibility to insure that the termination provisions of all equipment connected to such circuits are listed as suitable for the conductor sizes involved.

B. Wire pulling compounds shall be polywater or equivalent. The use of oils and greases shall not be permitted.

C. All field-installed control wire and cable terminating in panelboards, junction boxes, etc. shall be identified with pre-stamped tubular type markers or pressure sensitive linen labels covered with clear heat shrinkable tubing. Labels shall indicate circuit numbers, terminal numbers, etc. of each conductor. The identification labels shall be as manufactured by the W.H. Brady Company, Tyton, or equivalent.

D. No conductors shall be installed in raceways before the raceway system is properly installed and all work on the building which is liable to injure the conductors has been completed. Immediately before installing the conductors, the raceway, fittings and boxes shall be thoroughly cleaned and dried.

E. The sharing of the neutral conductor for branch circuits is prohibited unless specifically called for on the drawings.

F. Conductors shall be continuous between cabinets, outlets and/or junction boxes; no splices or taps shall be made within the raceway itself. Under no circumstances shall feeder conductors be spliced.

G. At least six inches (150 mm) of free conductors shall be left at each outlet, cabinet, junction box, etc. where they are connected or spliced.

H. Wiring devices shall not be used as splices; pigtails (line, neutral and grounding) from circuit wiring shall be provided to allow removal of the device without opening the circuit.

I. Wiring in cabinets shall be neatly laced or tied.

3.04 TESTING

A. Feeder shall be checked using an megohm tester to determine the insulation resistance levels prior to energizing.

B. Branch circuits shall be tested to ensure electrical continuity and to ensure the system is free of short-circuits.

END OF SECTION 260519

SECTION 260526 – GROUNDING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section specifies general grounding and bonding requirements for all electrical installations.

1.02 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, “Basic Electrical Materials and Methods”, apply to this Section.

1.03 SUMMARY

A. All circuits and equipment shall be grounded and bonded in accordance with Article 250 of the National Electrical Code and the requirements of these Specifications and the Drawings.

1.04 SUBMITTALS

A. In accordance with section Submittals and Division-26 Section, “Basic Electrical Materials and Methods”, the following shall be furnished:

1. Provide product data for all grounding and bonding components and accessories.

1.05 QUALITY ASSURANCE

A. All grounding components and accessories shall comply with and shall be installed in accordance with NFPA 70, Article 250 of the National Electrical Code, and applicable sections of UL Std 467, "Electrical Grounding and Bonding Equipment", and UL Std 869, "Electrical Service Equipment".

B. Grounding and bonding components and accessories shall be UL listed and labeled for the specific application for which they are being used.

PART 2 - PRODUCTS

2.01 GROUNDING AND BONDING

A. Provide electrical grounding and bonding components and accessories including, but not limited to, cables and wires, connectors, terminals, jumpers and surge arresters as required for a complete installation.

B. Where more than one product meets the intended requirements, selection shall be at the discretion of the Installer.

C. Provide electrical insulating tape, heat-shrinkable tubing, welding materials, straps and jumpers as recommended by manufacturer's written instructions and in accordance with standard industry practices.

2.02 GROUNDING CONDUCTORS

A. Provide a grounding conductor with green insulation.

B. General purpose insulating grounding conductors have insulation types as identified by the NEC and tested, certified, and labeled in accordance with UL Standards.

C. Connect new distribution panelboard grounding to existing ground field serving East Garage.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. All equipment, conduit systems, raceway systems, metallic enclosures of electrical devices, wiring devices, piping systems, mechanical equipment enclosures and all metallic non-current carrying devices, etc. shall be completely grounded in accordance with the requirements of the National Electrical Code (latest edition).

B. Structural steel shall not be used as a path to ground.

C. Grounding conductors shall be installed within conduit and shall be sized in accordance with NEC Article 250.

D. Continuity of rigid steel raceways shall be insured by conduit hubs. All grounded neutral conductors shall be continuously identified. All grounding and bonding connections shall be solderless.

E. Provide insulated grounding conductors for all feeders and branch circuits. Provide grounding blocks, terminals, etc. for connection of ground wires in all distribution equipment, outlets, junction boxes and utilization equipment.

F. All grounding wire, lugs, jumpers and bus shall be copper except as specifically approved elsewhere in these Specifications.

G. Receptacles shall be bonded to their outlet boxes with #12 copper straps. Straps may be omitted if self-grounding devices are utilized.

H. Building structural steel shall not be used as a pathway to ground.

END OF SECTION 260526

SECTION 260529 – SUPPORTING DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, “Basic Electrical Materials and Methods”, apply to this Section.

1.02 SUMMARY

A. Support all raceways, boxes, and related electrical equipment from the building structure as required by the NEC and as described in these Specifications.

1.03 SUBMITTALS

A. Provide product data for each type of manufactured supporting device.

B. Provide shop drawings for each type of fabricated supporting device.

1.04 QUALITY ASSURANCE

A. All components and the installation of all components shall comply with NFPA 70, "National Electrical Code," requirements.

B. All supporting devices shall be listed and labeled by UL, ETL, CSA or a Nationally Recognized Testing Laboratory (NRTL).

C. Comply with National Electrical Contractors Association's "Standard of Installation" pertaining to anchors, fasteners, hangers, supports and equipment mounting.

PART 2 - PRODUCTS

2.01 PROHIBITED MATERIALS

A. Nails, wires, perforated tape or plumber's tape are unacceptable for supporting or securing conduits.

2.02 MANUFACTURED SUPPORTING DEVICES

A. Supporting devices shall comply with manufacturer's standard design and construction, fabricated from standard materials in accordance with published product information.

B. Supporting devices shall be protected with a zinc coating or with a similar corrosion resistant coating or treatment. Devices for use outdoors shall be hot-dip galvanized.

C. Raceways shall be supported using clevis hangers, riser clamps, conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps.

D. Steel channels and associated support rods shall be selected to accommodate weight of associated raceway and wire.

E. Anchors shall be provided of adequate size to support the load, and shall be compatible with the construction method encountered. Anchors shall be expansion or toggle bolt type.

2.03 FABRICATED SUPPORTING DEVICES

A. Pipe sleeves shall be fabricated from galvanized sheet steel or Schedule 40 galvanized steel pipe.

B. Sheet steel sleeves shall be round tube closed with snaplock, joint, welded spiral seams, or welded longitudinal joint. Fabricate sleeves from the following gauge steel: 3" (75 mm) and smaller, 20 gauge (1.0 mm); 4" to 6" (100 mm to 150 mm), 16 gauge (1.6 mm); over 6" (150 mm), 14 gauge (2.0 mm).

C. Mechanical Sleeve Seals: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

D. Steel brackets shall be fabricated from angles, channels and other standard shapes. Brackets shall be assembled using welds and/or machine bolts to form a rigid assembly.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install hangers, anchors, sleeves and seals as indicated, in accordance with manufacturer's written instruction and following recognized industry practices to insure supporting devices comply with requirements. Comply with requirements of NECA, NEC and ANSI/NEMA for installation of supporting devices.

B. Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.

C. Install hangers, supports, clamps and attachments to support piping properly from building structure. Install supports within maximum spacing indicated by NEC or on drawings.

D. Individual conduits shall be secured with steel pipe straps or lay-in pipe hangers.

E. Multiple runs of suspended conduit shall be supported from trapeze style hangers.

F. Multiple runs of conduit on ceiling or wall surfaces shall be mounted on flush or surface steel channels.

G. Ceiling support wires shall not be used for support of conduits.

H. Raceway supports shall be adequate to carry present and future load multiplied by a safety factor of at least four. In no case shall a support strength of less than 200 pounds (1380 kPa) be used.

I. Manufactured watertight and fire-rated seals shall be provided for sealing conduits and cables passing through sleeves in floors and fire-rated walls. Seals shall be fire-resistant rubber plugs or other materials specifically designed to provide a watertight seal and a UL listed fire-resistant rating which meets or exceeds the rating of the floor or wall.

J. Cable supports shall be provided for vertical conduits in accordance with NEC Article 300. Cable supports shall be multi-section wedge-type plugs with an outside diameter and the number and size of openings required for the conduit and conductors.

K. Mechanical Sleeve Seals: Provide mechanical sleeve seals for sleeves located in foundation walls below grade, or in exterior walls. Loosely assemble rubber links around conduit with bolts and pressure plates located under each bolt head and nut. Push into sleeve and center. Tighten bolts until links have expanded to form watertight seal.

L. Supports are required within 3 feet (900 mm) of each outlet box, junction box, device box, cabinet, conduit body or other tubing terminations.

M. All junction boxes shall be supported from structure.

END OF SECTION 260529

SECTION 260533 – RACEWAYS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, Basic Electrical Materials and Methods, apply to this Section.

1.02 SUMMARY

A. All wiring shall be installed in raceways as hereinafter specified, unless otherwise indicated.

1.03 SUBMITTALS

A. Submit product data for raceways and fittings.

1.04 QUALITY ASSURANCE

A. All raceway components and the installation of raceway components shall comply with the following standards:

1. NFPA 70 "National Electrical Code"
2. Applicable NEMA Standards
3. Applicable UL Standards pertaining to raceway system

B. Raceway components shall be listed and labeled by UL, ETL or CSA.

PART 2 - PRODUCTS

2.01 RIGID METAL CONDUIT

A. Rigid metal conduits and couplings shall be full weight, heavy wall steel, galvanized, with threaded connections conforming to the latest editions and revisions of ANSI Standard C-80.1 and Federal Specifications WW-C-581E.

B. Fittings shall be steel or cast malleable iron by Chrouse-Hinds, O-Z, T & B, Steel City, Efcor, or equal. O-Z type "AX" or equal fittings with bonding jumpers shall be used in each rigid metal conduit passing across a building expansion joint. Type of fitting shall be properly chosen for the movement anticipated.

C. Insulating bushings shall be used on all rigid metal conduit terminations and shall be O-Z type "B" or equal.

D. T & B Series 141, or equal, locknuts shall be used on both inside and outside on all enclosures.

E. O-Z type "S", or equal, cable supports shall be used in conduit risers as required by the NEC.

2.02 INTERMEDIATE METAL CONDUIT

A. Intermediate Metal Conduit (IMC) and couplings shall be steel, galvanized, with threaded connections, conforming to the latest editions and revisions of Federal Specifications WW-C-581E and Underwriter's Laboratories Standard 1242.

2.03 RIGID ALUMINUM CONDUIT

A. Aluminum conduit shall not be used.

2.04 CONDUIT BODIES AND FITTINGS

A. All couplings, elbows, cast fittings and conduit bodies shall be made of materials of high quality throughout and shall be a first-grade commercial product, well made and free from mechanical imperfections and defects.

B. Bushings shall be used on all conduits to provide a smooth, well rounded, insulated surface. Bushings shall be metallic with plastic throats. The insulating material shall have a UL temperature rating of 302°F (150°C), it shall be molded-on to the metal and shall become an integral part of the bushing.

C. Erickson or split couplings shall not be used in lieu of running threads.

D. Entrance seals shall be provided where conduits pass through exterior concrete or masonry walls below grade. The entrance seals shall consist of a hot dip galvanized shell, sealing gland assembly capable of providing a seal around the conduit to withstand fifty feet head of water without leakage. The shell of the seal shall have at least two (2) cast collars at a right angle to the sleeve that is embedded in the concrete. Entrance seals shall be O.Z./Gedney Type WSK, FSK or equal.

E. Conduit hubs shall be malleable iron, zinc plated rain-tight type complete with integral insulated throat, captive O-ring seal and oversize nut. Hubs shall be Myers "Screwtite," O.Z./Gedney "Space Maker," or equal.

2.05 IDENTIFICATION

A. Exposed raceways shall be identified at junction and pull boxes and at points not more than 20 feet (6 m) on centers. See Division-26 Section, Basic Electrical Materials and Methods for additional identification requirements.

B. Labels shall indicate the system voltage and/or type of service and shall have an appropriate legend, such as:

1. 208Y/120 VOLTS – POWER
2. 120 VOLTS – FIRE ALARM
3. TELECOM

C. Labels shall appear in white letters of 1/2 inch (13 mm) minimum height on a black background. Labels shall be installed in accordance with the manufacturer's instructions and sizes shall match the conduits to which they are applied. Labels shall be ordered sufficiently prior to their need so that they will be on hand when required for installation. Failure to allow adequate time for delivery of labels, including special legends, will not be considered valid reason for substitution of labels of a different type.

PART 3 - EXECUTION

3.01 WIRING METHODS

A. Exterior locations above grade - rigid metal conduit.

B. Interior exposed locations, up to 10' - 0" (3 m - 0 mm) AFF - intermediate metal conduit.

C. Exposed locations within interior spaces, above 10' - 0" (3 m - 0 mm) AFF – intermediate metal conduit.

D. Damp or wet locations - rigid metal conduit.

E. Within concrete and masonry exterior walls - intermediate metal conduit.

F. Concealed locations, accessible, dry - intermediate metal conduit.

G. Concealed locations, non-accessible, dry - intermediate metal conduit.

H. Minimum conduit size shall be 3/4" (19 mm).

3.02 INSTALLATION

A. Unless otherwise noted on the contract drawings, all raceways shall be installed concealed in the ceilings, walls or partitions of the building, and in such a manner as not to impair the integrity of the structure. Unless otherwise specified, raceways may be installed exposed in mechanical rooms, electrical rooms, large storage spaces and in large janitor's closets, pipe shafts, suspended ceiling spaces, and where required for equipment connections. Exposed raceways shall be installed parallel or perpendicular to walls, structural members or intersection of vertical planes and ceilings, with right angle turns consisting of box-type fittings or symmetrical bends.

B. The Contractor shall exercise the necessary precautions to prevent water, dirt, plaster or trash in raceways, fittings and boxes during the course of installation; raceways, fittings, or boxes clogged in such manner that cannot be thoroughly cleaned, shall be replaced. All unconnected conduit ends shall be properly capped. Raceways shall be kept at least 12 inches (300 mm) from parallel runs of flues, steam pipes or hot water pipes. Bends and offsets shall be kept to a minimum, and they shall be made without flattening or deformation with approved hickey or bending machine; the radius of the curve of the inner edge of any field bend shall not be less than the value specified in the National Electrical Code. Raceway runs shall not exceed 100 feet (30 m) between outlets; where necessary, even though not indicated on the drawings, box-type fittings or pull boxes shall be installed. Moisture traps shall be avoided as much as possible. Except as noted, raceways shall not be installed horizontally within concrete slabs-on-grade; raceways shall be installed underground, below the slab. Expansion fittings or other approved devices shall be used to provide for expansion and contraction where raceways cross expansion joints.

C. Raceways shall have supports spaced not more than 8 feet (2400 mm) apart, except in vertical risers where 2 inch (50 mm) and larger rigid metal conduit may be supported at intervals not larger than 15 feet (4.5 m). Raceways shall be supported on approved types of zinc-coated wall brackets, clamps, ceiling trapeze hangers, strap hangers, or pipe straps firmly secured in an approved manner. All ends of

raceways shall be reamed to remove rough edges. Raceways shall be firmly attached to sheet-metal enclosures NEMA type 1 by means of proper metallic, plastic throated bushings and locknuts; and to sheet-metal enclosures NEMA types 3, 4, 6, 12 or 13, by means of interchangeable, metallic, plastic-throated, raintight hubs. When installing locknuts and bushings, care shall be observed to see that the full number of threads project through to permit the bushing to be drawn tight against the end of the conduit, after which the locknut shall be made up sufficiently rigid to draw the bushing into firm electrical and mechanical contact with the box; two locknuts, one inside and one outside, plus the bushing, shall be used where required. Proper electrical continuity shall be established throughout the entire raceway system. An approved compound shall be applied to all field threads before installation.

D. All conduits shall be tested for clearance and smooth joints and then capped immediately after installation by T & B "push penny" plugs, or equal, to prevent entrance of moisture or debris.

E. No wire shall be pulled into conduits until system is complete and the building is thoroughly dry.

F. Conduits passing from heated to unheated spaces, exterior spaces, refrigerated spaces, cold air plenums, etc., shall be suitably sealed with "Duxseal" by Johns Manville or sealing fittings to prevent accumulation of condensation.

G. Conduits and sleeves penetrating floor slabs and fire-rated partitions shall have the chopped out space between the outer wall of the piping and the concrete sealed with fire resistant material listed by UL for use in fire rated floor and partition systems. Sleeves penetrating floor slabs shall extend 1-1/2" (40 mm) above the finished floor.

H. Conduits less than 12" (300 mm) in length connecting outlets of adjoining rooms shall be sealed with "Duxseal" by Johns Manville to prevent noise transmission between rooms.

I. Pull wires shall be installed in all empty conduits. Use No. 14 AWG monofilament plastic line having not less than 200-lb. (1380 kPa) tensile strength. A minimum of 12 inches (300 mm) of slack shall be provided at each end of the pull wire.

3.03 CLEANING

A. Inspect all raceways; clear all blockages; and remove all burrs, dirt and construction debris from raceways before installing conductors.

END OF SECTION 260533

SECTION 260534 - BOXES, FITTINGS AND CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, “Basic Electrical Materials and Methods”, apply to this Section.

1.2 SUMMARY

A. Provide and install outlet boxes, pull and junction boxes, cabinets and enclosures as required by the Drawings and as required by field conditions for a complete installation in accordance with the National Electrical Code.

1.3 SUBMITTALS

A. Provide product data for all cabinets and enclosures.

1.4 QUALITY ASSURANCE

A. All items provided under this Section shall be listed and labeled by UL or a Nationally Recognized Testing Laboratory (NRTL).

B. The components and installation shall comply with NFPA 70 "National Electrical Code."

C. Enclosures shall comply with NEMA Standard 250, "Enclosures for Electrical Equipment."

PART 2 - PRODUCTS

2.1 METALLIC OUTLET BOXES

A. Outlet boxes shall conform to UL 514A, "Metallic Outlet Boxes, Electrical," and fittings shall conform to UL 514B, "Fittings for Conduit and Outlet Boxes."

B. Outlet boxes for indoor and dry locations shall be minimum 4" (100 mm) square or octagonal, 2-1/8 inch (53 mm) deep, zinc-coated sheet steel with stamped knockouts, threaded screw holes and mounting accessories suitable for each location and application. Straps, cable clamps, exterior rings and fixture studs shall be provided as required.

C. Outlet boxes for outdoor or wet locations shall be minimum 4" (100 mm) square copper-free aluminum cast boxes with threaded raceway entries, threaded screw holes and mounting accessories suitable for each location and application. Straps, mounting feet, closure plugs, cable clamps, exterior rings and fixture studs shall be provided as required.

D. Outlet boxes in concrete construction shall be of sufficient depth to keep conduits a minimum of 1" (25 mm) from the wall surface.

E. No "thru-wall" boxes shall be used in partitions.

F. Outlet boxes in masonry partitions shall have square corners with no mounting tabs and shall be of sufficient depth to suit the block or brick construction.

2.2 NONMETALLIC OUTLET BOXES

A. Nonmetallic outlet boxes shall not be used.

2.3 PULL AND JUNCTION BOXES

A. Pull and junction boxes over 100 cubic inches (.0016 m3) in volume shall comply with UL Standard 50, "Electrical Cabinets and Boxes."

B. Boxes shall have screwed or bolted-on covers of the same material as the box and shall be sized to accommodate the application and the site conditions.

C. Sheet steel boxes shall have welded seams and shall have structural bracing where required to provide a rigid assembly.

D. All boxes for concealed work shall be constructed of minimum 12 gauge galvanized sheet steel with welded seams and shall be provided with mounting brackets. Integral bracing shall be provided where required to provide a rigid assembly.

E. All boxes installed in wet locations or on the building exterior shall be constructed from galvanized sheet steel with gasketed covers.

2.4 CABINETS

A. Cabinets shall conform to UL Standard 50, "Electrical Cabinets and Boxes."

B. Backboxes shall be constructed from galvanized sheet steel, and fronts and doors shall be constructed from rolled sheet steel. Cabinets shall be NEMA 1 except as otherwise noted. Cabinets shall consist of a box and a one-piece frame front with a hinged door. Concealed fasteners shall secure front to box and provide adjustment to permit alignment of front and box.

C. Hinges shall be flush, shall not be more than 6" (150 mm) from the top and bottom of the door, and shall be no more than 24" (600 mm) apart. Doors greater than 48" (1200 mm) in height shall have 3-point latching mechanism.

D. Surface mounted cabinets shall have fronts of the same height and width as the box. Flush mounted cabinets shall have fronts which extend 3/4" (19 mm) beyond box in all directions.

E. Double doors shall be provided for cabinets wider than 24" (600 mm).

F. Doors shall have combination spring catch and key lock. All locks for cabinets of a common system shall be keyed alike.

PART 3 - EXECUTION

3.1 OUTLET BOXES

A. Outlet boxes shall be firmly secured in place, plumb and level. Outlet boxes installed in suspended ceilings shall not be supported from the ceiling system. Outlet boxes for like devices shall have a uniform mounting height unless specifically noted otherwise.

B. Outlet boxes over windows and doors shall be installed 7'-6" (2250 mm) above the finished floor, centered over the door or window unless otherwise noted.

C. Covers shall be installed on all outlet boxes.

D. Outlet boxes for wall mounted video equipment shall be installed with the center of the box 80" (2000 mm) above the finished floor or 6" (150 mm) below the finished ceiling, whichever is lower unless otherwise noted on the drawings.

E. Outlet box mounting heights shall be as indicated. Mounting heights shall be to the center line of the box.

F. All outlet boxes installed in wet locations and/or on exterior of building shall be cast aluminum with gasketed covers.

3.2 PULL AND JUNCTION BOXES

A. Pull and junction boxes shall be no smaller than 8 inches (200 mm) square by 4 inches (100 mm) deep.

B. Boxes shall be the minimum size as required by the National Electrical Code or larger as indicated on the Drawings.

C. Junction and pull boxes shall be furnished and installed where indicated on the Drawings or where required by the NEC.

D. Boxes for communication, data and signaling systems shall be 50 percent larger than the size required by the NEC and shall be located to permit ready access for installation of future raceways and conductors.

3.3 CABINETS AND ENCLOSURES

A. Fronts of cabinets and enclosures shall be mounted straight and plumb with building surfaces.

B. Cabinets and enclosures 68" (1700 mm) or less in height shall be installed with the top of the cabinet or enclosure 72" (1800 mm) above the finished floor. All cabinets and enclosures shall be installed in accordance with the NEC.

C. Cabinets and enclosures installed adjacent to one another shall be installed with the tops of the cabinets and enclosures at the same height.

D. Boxes for communication, data and signaling systems shall be 50 percent larger than the size required by the NEC and shall be located to permit ready access for installation of future raceways and conductors.

3.4 GROUNDING

A. All metallic boxes, cabinets and enclosures shall be effectively grounded in accordance with Article 250 of the NEC.

B. Provide a grounding terminal in the interior of all boxes, cabinets and enclosures.

3.5 CLEANING

A. After installation, clean and repair all boxes, cabinets and enclosures. Galvanized finishes shall be repaired using a zinc-rich paint as recommended by the manufacturer. Painted finishes shall be repaired using a matching paint from the manufacturer.

END OF SECTION 260534

SECTION 260573 - COORDINATION STUDY

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall engage the services of a qualified professional engineer to perform a short circuit and protective device coordination study and an arc flash hazard analysis. The Contractor is responsible for providing all pertinent information required by the preparers to complete the study. The study shall be performed in strict accordance with these specifications.

B. The study shall include all portions of the electrical distribution system from the utility overcurrent device to the new 208Y/120 volt branch circuit panelboards being added under this project as well as all existing panelboards located in the main electric room.

C. The study shall be completed using the most current versions of NFPA 70E, Standard for Electrical Safety in the Workplace and IEEE-1584, Guide for Performing Arc-Flash Hazard Calculations.

PART 2 - PRODUCTS

2.1 SHORT CIRCUIT STUDY

A. The Contractor shall provide a short circuit study for the electrical distribution system. The study shall include the calculation of three phase bolted fault values and phase to ground fault values at every point of application of a protective device on the system. Momentary and interrupting duty values shall be calculated.

B. Obtain a letter from the utility company indicating what the available fault current and X/R ratios are at the service entrance. Provide the letter in an appendix of the report.

C. The short circuit calculations shall be performed by a computer program. Provide a computer generated single line diagram showing calculated and rated fault levels for each piece of electrical equipment.

D. The short circuit study report must include a complete index of fault bus identifications. A system diagram indicating system configuration and the fault bus locations shall be provided in the study.

E. Provide a complete printout of the results of the calculations.

F. Momentary duty fault values shall be tabulated for both three phase and phase to ground faults including: bus identification, bus L-L voltage, symmetrical fault current values, symmetrical fault kVA values, and X/R ratio at each fault bus.

G. Interrupting duty fault values shall be tabulated for both three phase and phase to ground faults including: bus values, symmetrical fault kVA values, X/R ratio at each fault bus, asymmetry factor at each fault bus, and the associated asymmetrical fault value at the bus.

H. Manufacturer's published interrupting/withstand capabilities shall be compared to calculated fault current values to determine acceptability of each protective device installed on the system. A tabulation shall be provided detailing the comparison.

I. The short circuit study shall report any deficiencies in interrupting capabilities and include recommendations for correcting such deficiencies.

2.2 PROTECTIVE DEVICE COORDINATION STUDY

A. The Contractor shall provide a protective device coordination study for all protective devices installed on the electrical distribution system.

B. The coordination study shall begin with the first upstream utility protective device and continue down through the distribution system to the first device on each feeder which does not have adjustable trip characteristics.

C. Time-current coordination curve sheets shall be developed on log-log paper utilizing manufacturer's published time-current characteristics. Key coordination elements shall be plotted to demonstrate the level of coordination provided.

D. Each curve sheet shall have a single line diagram indicating the portion of the system being plotted.

E. Each curve sheet shall be accompanied by a detailed narrative explaining the coordination provided, and any compromises made between protection and selectivity.

F. The coordination study report shall provide complete tabulations of all protective devices, ratings and settings. Recommendations shall be provided to improve coordination where necessary.

2.3 ARC FLASH HAZARD ANALYSIS

A. Provide arc flash hazard calculations for all electrical distribution equipment identified in NEC Article 110.16, Flash Protection.

B. Provide arc flash hazard calculations per IEEE-1584. Calculations shall provide the flash protection boundary (ft.), arc flash hazard category and the required personnel protective equipment (PPE) for all electrical distribution system equipment included in the Arc Flash Hazard Analysis. Also provide incident energy level as calculated in analysis.

C. Provide an arc flash hazard warning label on all electrical distribution system equipment included in the Arc Flash Hazard Analysis. The label shall comply with ANSI Z535.4-1998, Product Safety Signs and Labels. The label shall include, but not be limited to, the flash protection boundary, flash hazard category, and required PPE.EXECUTION

2.4 REPORT

A. The short circuit and coordination study shall be completed prior to releasing for manufacture of all switchboards, fused switches, panelboards, circuit breakers and other equipment with overcurrent protection.

B. Six (6) copies of a bound report shall be submitted for review and approval at the completion of the short circuit and coordination study. The report shall contain all of the items required by these specifications. The report must be submitted prior to the delivery of any distribution equipment submittals. Submittal reviews of distribution equipment shall be withheld until the report is received, reviewed, and approved.

C. Time-current coordination curve sheets may be reduced to 8-1/2 x 11 size for inclusion in the report. However, full size curve sheets shall be provided, not necessarily bound, with each copy of the report.

D. The Contractor shall warrant that errors and omissions in the study or report shall be corrected without charge to the Owner when so found within twelve (12) months from acceptance of the first report.

E. Copies of the approved study shall be included in the manuals specified in Division-26 Section, “Basic Electrical Materials and Methods.”

END OF SECTION 260573

SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, Basic Electrical Materials and Methods, apply to this Section.

B. Cabinets and enclosures shall conform to Division-26 Section, Boxes, Fittings and Cabinets.

1.2 SUMMARY

A. Furnish and install panelboards, cabinets and boxes as indicated on the Drawings and as specified herein.

1.3 SUBMITTALS

A. Provide product data for all panelboards, enclosures, cabinets, overcurrent devices and accessories.

B. Provide time-current-characteristic curves for all phase overcurrent devices rated 100 amperes or more and for all ground fault protective devices.

1.4 QUALITY ASSURANCE

A. Panelboards shall be supplied and installed in strict conformance with NFPA 70, National Electrical Code.

B. Products supplied under this Section shall comply with applicable requirements of UL standards pertaining to panelboards, overcurrent devices, enclosures, and cabinets. Completed assemblies shall be UL listed and labeled.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Schneider Electric, Square D Company

B. No substitutions.

2.2 PANELBOARDS

A. Panels shall be of the circuit breaker type, and shall have capacity and arrangement as shown on the panel schedules or one-line diagram.

B. Branch circuit breakers shall be bolt-on type and shall be of the ambient compensated, thermal magnetic type, which will provide inverse time delay overload, and instantaneous short circuit protection. Branch circuit breakers shall have one, two or three poles as designated on the panel schedule. No circuit breakers utilizing handle ties for two or three pole operation shall be acceptable. Voltage and current ratings shall be as indicated on the drawings.

C. Refer to panel schedules on drawings for exact circuit breaker arrangements and interrupting capacities. Provide circuit breakers UL listed as type HACR for air conditioning equipment branch circuits.

D. Main breakers and branch breakers shall have the same minimum ampere interrupting capacity. Series rating shall not be acceptable.

E. Provide a typewritten directory for each panel, placed inside the panel door. The directory shall list all rooms served by each breaker, using the "Owner's" room numbers. Directories shall be installed in a metal directory frame under glass or minimum 0.03 (.75 mm) inch thick clear non-yellowing plastic. Spares and spaces shall be written in pencil.

F. All circuit breakers which serve time clocks, telephone and communication equipment, exit signs, emergency circuits, fire alarm, security, and other miscellaneous control devices shall be equipped with mechanical handle locking devices.

G. Each panel shall be equipped with a ground bus, adequate for feeder and branch circuit equipment grounding conductors; bonded to box.

H. Each panel and cabinet and the units comprising same shall bear the manufacturer's nameplate and the UL label. Panelboards used for service entrance equipment shall be UL Service Entrance rated/labeled.

I. All single-phase, three-wire and three-phase, four-wire panels shall be equipped with a fully rated neutral bar. The neutral bar shall be sized to accommodate oversized neutral conductors where oversized neutral conductors are indicated on the Drawings.

J. All bus shall be copper.

K. Cabinet and trim shall be of code gauge steel (minimum) with 4" (100 mm) (minimum) wiring gutter all around. All panelboards shall be equipped with a hinged, locking door and hinged trim. Two (2) keys shall be furnished with each cabinet, and all locks on all cabinets shall be keyed alike. Provide door-in-door panel cover.

L. Where panels occur adjacent to one another in finished spaces, cabinets and doors for each panel shall be of the same height.

M. Panelboards shall be painted with gray over rust preventive primer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount panels in locations shown, making sure that code-required clearances exist.

B. Where cabinets cannot be set fully flush due to shallowness of partition, trim protruding sides with approved metal or hardwood molding, fastened to cabinet so as to conceal intersection of wall and cabinet.

C. If paint is damaged during shipping or installation, damaged portion shall be sanded smooth and entire panel repainted.

D. Load Balancing: After substantial completion, but not more than 60 days after final acceptance, measure load balancing and make circuit changes.

1. Measure loads during periods of normal system loading (coordinate with Owner).

2. Perform load balancing circuit changes outside normal occupancy/working schedule of the Owner at time directed by Owner's representative.

3. After circuit changes are completed, recheck loads during normal load period. Record all load readings before and after changes and submit test results.

4. Tolerance: Difference exceeding 20 percent between phases within a panelboard is not acceptable. Rebalance and recheck as necessary to meet this requirement.

END OF SECTION 262416

SECTION 262726 – WIRING DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, “Basic Electrical Materials and Methods”, apply to this Section.

B. The requirements for outlet boxes and device enclosures are provided in Division-26 Section, “Boxes and Fittings”.

1.02 SUMMARY

A. The Contractor shall furnish and install all wiring devices indicated on the Drawings or specified herein.

1.03 SUBMITTALS

A. Provide product data for each type of wiring device specified.

1.04 QUALITY ASSURANCE

A. All products and the installation of all products shall comply with NFPA 70, "National Electrical Code."

B. Wiring devices shall be listed and labeled by UL and shall confirm to the latest UL and NEMA standards pertaining to wiring devices.

PART 2 - PRODUCTS

2.01 WIRING DEVICES

A. All wiring devices shall be Specification Grade.

B. Wiring devices shall be white in color unless otherwise indicated.

C. Convenience receptacles shall be duplex, grounding type, 20A, 2P, 3W, 125V, NEMA 5-20R, straight blade, nylon or high-strength thermoplastic material.

D. Wall plates for receptacles, etc. in indoor dry areas, shall be satin finish stainless steel Type 302 for concealed raceways; and zinc-coated sheet steel or cast metal having round or beveled edges, for exposed raceways.

E. Single throw toggle switches shall be quiet type rated 20A, 1P, 120/277 VAC.

F. Special receptacles shall be NEMA types as indicated on the Drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install wiring devices and accessories as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and in accordance with recognized industry practices to fulfill project requirements.

B. Coordinate with other work, including painting and installation of electrical boxes and wiring.

C. Install wiring devices only in electrical boxes which are clean; free from building materials, dirt, and debris.

D. Install wiring devices after wiring work is completed.

E. Install wallplates after painting work is completed.

F. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486A. Use properly scaled torque indicating hand tool.

G. Protect installed components from damage. Replace damaged items prior to final acceptance.

3.02 TESTING

A. Prior to energizing circuits, test wiring for electrical continuity and short-circuits. Ensure proper polarity of connections is maintained. Subsequent to energizing, test wiring devices and demonstrate compliance with requirements, operating each operable device at least six (6) times.

END OF SECTION 262726

SECTION 262736 – ELECTRICAL CONNECTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, “Basic Electrical Materials and Methods”, apply to this Section.

1.02 SUMMARY

A. The Contractor shall provide electrical connections to and between all equipment indicated on the Drawings and Schedules and in the Specifications.

B. Electrical connections shall be provided for, but not limited to, security, fire alarm and video systems.

C. Unless otherwise specified, the Contractor shall, under this Section, mount and align all control devices and other related equipment whether specified in this or other Sections of the specifications, except where such items are factory mounted on the driven equipment. The mounting and alignment of starters and control devices for the automatic temperature control system are included in the Sections in which the equipment is specified.

D. Unless otherwise specified, the Contractor shall, under this Section of the specifications, provide all wiring, including conduit, wire, junction boxes, overcurrent protection, etc., not specified elsewhere in this specification, to and between all control devices and related electrical equipment, whether specified in this or other Sections of this specification, except where such items are factory wired, as well as factory mounted on the driven equipment.

E. Wiring for the automatic temperature control system is specified in other Sections of the specification.

F. Unless otherwise specified, all wiring to motors, control equipment and related electrical equipment, shall be installed in conduits with flexible metal conduit connections utilized for final motor connections. Flexible conduits shall be large enough to accommodate motor feeder, ground conductors and control wires, whether or not so indicated on the drawings. Flexible conduits shall be limited to a maximum length of 6'-0" (1800 mm-0 mm).

G. The drawings are diagrammatic. It is imperative that the contractor obtain exact rough-in information for all equipment well in advance of actual installation to provide coordination for his and other trades.

1.03 SUBMITTALS

A. Submit product data for all materials and components used for electrical connections.

1.04 QUALITY ASSURANCE

A. All materials and components and the installation of all materials and components shall comply with the requirements of the following standards:

1. NFPA 70 "National Electrical Code"
2. IEEE Standard 241 "IEEE Recommended Practice for Electric Power Systems in Commercial Buildings"
3. Applicable standards of ANSI/IEEE and NEMA pertaining to the products and installation of products for electrical connections
4. UL Standard 486A "Wire Connectors and Soldering Lugs for Use with Copper Conductors"

B. All materials and components shall be listed and labeled by UL or ETL.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide all materials and components required for terminations of all circuits. All wiring shall be spliced and terminated using lugs and/or terminal blocks, except as permitted elsewhere in these Specifications.

B. All terminations of feeders and branch circuit wiring rated 600 volts or less, except as noted elsewhere in these specifications, shall be made using mechanical clamp-type set-screw lugs. Lugs which incorporate direct contact between the set-screw and the conductor shall not be permitted.

C. All splices in branch circuit wiring rated 600 volts and less, except as permitted elsewhere in these Specifications, shall be made using compression type lugs specifically designed for the type, size and rating of the conductor. The lugs shall be installed using a tool specifically designed for the purpose.

D. Splices in branch circuit wiring shall only be made to provide connections to wiring devices, lighting fixtures, etc. These splices in copper branch circuit wiring for sizes #12 and #10 AWG may be made with non-tool, pre-insulated, molded wire connectors. Homerun wiring from first device in branch circuit to panel shall not be spliced except for existing branch circuits being intercepted and extended to new panelboards where existing backboxes are being provided with terminal strips (refer to details on drawings). Feeders shall not be spliced.

E. Tapes:

1. Self-adhesive tapes shall be used to insulate conductor splices. Terminations shall be in conformance with the following standards:

   a. 600 Volts, Nominal and Less: UL 510, ASTM D-2754, ASTM D-3005, and ASTM D-4388.

2. Vinyl plastic electrical tape shall be used for all terminations and splices of conductors for circuits of 600 volts nominal and less, except terminations in motor terminal boxes, transformer terminations, lighting and all heat producing equipment terminations. Terminations of the equipment listed herein shall be insulated with pressure sensitive glass cloth tape.
3. Tapes shall be the standard product of 3M Corporation, Plymouth Rubber Company, Inc. or approved equivalent.

F. Special lugs may be required to accommodate the size and number of conductors shown on the Drawings. The Contractor shall verify lug requirements

for all circuit breakers and equipment terminals and shall provide correct lugs as required.

G Pre-insulated solderless ring or spade type crimp connectors and terminals shall be used for all alarm and control circuits.

H. All connectors and terminals shall be of the proper size and ampacity, material and type for the application and service.

I. Fire Alarm Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated or interrupted in any enclosure associated with the fire alarm system to screw terminal strips. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs.

J. Use numbered screw terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.

2.02 RACEWAYS AND FITTINGS

A. The Contractor shall provide raceways and fittings of the types, sizes, and finish indicated for each type of service. Where the type of raceway is not specified, the Contractor shall provide and install a raceway of proper selection as determined by the installer to fulfill the wiring and equipment connection requirements and comply with NEC requirements for raceways.

B. All raceways and fittings and the installation of all raceways and fittings shall comply with the requirements of these Specifications.

PART 3 - EXECUTION

3.01 INSPECTION

A. The Contractor shall inspect the area where electrical connections are to be installed. The installation of electrical connections shall not be permitted until site conditions are satisfactory.

3.02 INSTALLATION

A. The Contractor shall install all electrical connections in accordance with the manufacturer's written instructions using recognized industry practices.

B. Power, control, data, signal and communication circuits shall be connected to equipment in accordance with the manufacturer's wiring diagrams. The Contractor shall be fully responsible for the correct termination and interface of all electrical connections.

C. Splices shall be insulated with tape which provides an insulation rating which meets or exceeds the insulation rating of the conductor. All outdoor splices shall be made watertight using tapes and sealants specifically designed and listed for outdoor applicatons.

D. Wiring devices shall not be used as splices.

E. Electrical connections shall be tightened in accordance with equipment manufacturer's published torque tightening values. The installer shall use proper tools which shall include torque screwdriver, torque wrench, and ratchet wrench with adjustable torque settings.

F. UL Standard 486A torque tightening values shall be used when manufacturer's published tightening values are not available.

3.03 TESTING

A. All electrical connections shall be tested to ensure electrical continuity and compliance with these Specifications.

B. The Contractor shall demonstrate to the Montgomery College Project Manager or Engineer that a random selection of electrical connections has been tightened in accordance with the manufacturer's published torque tightening values.

END OF SECTION 262736

SECTION 262816 - DISCONNECTS, SWITCHES AND CONTACTORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Drawings and Division-26 Section, “Basic Electrical Materials and Methods”, apply to this Section.

1.2 SUMMARY

A. The Contractor shall furnish and install motor disconnect switches where indicated on the Drawings and where required by the National Electrical Code, local codes and the authority having jurisdiction.

1.3 SUBMITTALS

A. Provide product data for each type and rating of circuit and motor disconnect switch.

1.4 QUALITY ASSURANCE

A. Motor disconnect switches and the installation of same shall comply with the requirements of NFPA 70, "National Electrical Code."

B. Motor disconnect switches shall be listed and labeled by UL.

PART 2 - PRODUCTS

2.1 MOTOR DISCONNECT SWITCHES

A. Switches shall be constructed in accordance with the latest editions and revisions of NEMA Standard KS-1, Federal Specification W-S-685C, and Underwriters' Laboratories Standard 98.

B. Switches shall be fusible or non-fusible as indicated on the Drawings, or as required by the equipment served, horse-power rated, quick-make, quick-break, heavy-duty type with integral arc suppressors. The handle shall be part of the enclosure, not the cover.

C. Fused switches and fuses shall have a minimum integrated interrupting rating of 100,000 amperes RMS symmetrical.

D. Switches shall have general purpose surface mounted NEMA type 1 or 3R enclosures as indicated or required by locations. All enclosures shall be designed to permit padlocking in the "open/off" position.

E. Fused switches for motor applications shall be furnished with UL listed dual-element Class RK-1 time delay fuses rated 600 volts. Fuse current ratings shall be as indicated on the Drawings or in accordance with the motor manufacturer's recommendations when specific sizes are not specified on the Drawings.

2.2 ACCESSORIES

A. Provide electrical interlocks where indicated on the Drawings.

B. Provide one normally open and one normally closed auxiliary contact on each switch. Auxiliary contacts shall be rated 10A, 120 VAC.

C. Fused disconnects and switches shall be provided with integral built-in fuse pullers arranged to facilitate fuse removal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Switches shall be coordinated with the equipment to provide switches to suit the particular equipment characteristics and requirements.

B. Provide fusible switches for all equipment labeled for and/or requiring fuse protection.

C. Switches shall be installed in accordance with manufacturer's published instructions.

D. Provide three (3) spare fuses of each type and rating furnished for this project. Deliver spare fuses to the Owner's place of storage.

3.2 TESTING

A. Prior to energizing circuits and switches, test wiring for electrical continuity and short-circuits.

END OF SECTION 262816

SECTION 265100 - LIGHTING FIXTURES (LED)

PART 1 - GENERAL

1.1 SUMMARY

A. This section provides general requirements for a complete and fully operational lighting system including:

1. Interior lighting fixtures
2. LED modules
3. Drivers
4. Accessories
5. Light fixture support

1.2 RELATED SECTIONS

A. Basic Materials and Methods

B. Wiring Devices

C. Grounding

D. Supporting Devices

1.3 REFERENCES

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and Sections under Division-01 General Requirements.

B. Conform to Reference Standards by date of issue current on date of Contract Documents, except where a specific date is established by code.

1. ANSI/NFPA 70 National Electrical Code
2. NFPA 101 Life Safety Code
3. UL 57 Electrical Luminaires
4. UL 496 Lampholders
5. UL 924 Emergency Lighting and Power Equipment
6. UBC Standard Section 47.1813 Luminaires
7. IES LM-79 Electrical and Photometric Measurements of Solid State Lighting
8. IES LM-80 Method for Measuring Lumen Maintenance for SSL

Light Sources

1.4 SYSTEM DESCRIPTION

A. The Lighting Fixture Schedule and catalog numbers indicated are a design series reference and do not necessarily represent the exact catalog number, size, voltage, wattage, lumen output, Color Rendering Index (CRI), color temperature (CCT), driver, finish trim, ceiling type, mounting hardware, or special requirements as specified or as required by the particular installations. Provide complete fixture to correspond with the features, accessories, lumen output, wattage and/or size specified in the text description of each fixture type. Additional features, accessories and options specified shall also be included to provide a complete and operable system.

B. Provide all frames, supplementary support structures, hangers, spacers, stems, aligner canopies, auxiliary junction boxes and other hardware as required for a complete and proper installation. Recessed fixtures shall have frames that are compatible with the ceiling systems.

C. Light fixture voltage shall match the voltage of the circuit serving the light fixture.

1.5 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

C. Comply with applicable requirements of local codes and NEC Articles 220 and 410 as applicable to construction and installation of lighting fixtures.

D. Comply with applicable NEMA, IES and UL standards. Lighting fixtures and components shall be UL listed and labeled.

E. Comply with NFPA 70.

F. Luminaires, drivers, LED modules/sources and other components and controls shall equal or exceed the requirements of all applicable state and/or municipal energy codes.

G. Designated manufacturers are listed to define the requirements for quality and function of the specified product. Equivalent or better products of other, unnamed manufacturers may be proposed for consideration by adhering to procedures set forth in this section and in other Division-01 specification sections.

1.6 SUBMITTALS

A. Comply with requirements of specification section describing Submittal Procedures. Also, refer to the electrical specification section, Basic Materials and Methods, for re-submittal requirements.

B. The authorized manufacturer's representative for the project area shall prepare submittals for each lighting fixture type. In addition to the fixture submittals, a list shall be provided identifying the manufacturer representative for each fixture type. Provide manufacturers' names, addresses, and telephone numbers.

C. Light fixture submittals shall include the total fixture maximum input wattage, including driver and/or power supply losses for each and every fixture in one submittal package. This information shall be clearly indicated in the submittal. The lighting fixture submittal package will not be reviewed until this information is submitted as required. Input wattage shall not exceed the maximum allowable total input watt value shown in the lighting fixture schedule.

D. Product Data shall indicate that light fixture, lumen output, CCT, CRI, driver, input watts, and controls fully comply with contract documents. Data shall be submitted for each type of light fixture indicated, arranged in order of fixture designation. For standard catalog fixtures provide original product catalog sheets indicating data on features, accessories, finishes, and the following:

1. Materials and dimensions of luminaires.

2. Photometric data, in IES format, based on certified results of laboratory tests of each light fixture type, outfitted with LED modules/sources, drivers, and accessories identical to those indicated for the light fixture as applied in the Project.

    a. Photometric data shall be certified by a qualified independent testing agency.

    b. Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program (NVLAP) for Energy Efficient Lighting Products.

3. Emergency lighting unit battery and charger.

4. LED drivers and power supplies.

5. LED modules, including manufacturer, drive current, CRI, and CCT.

E. Shop Drawings shall:

1. Show details of nonstandard or custom fixtures.

2. Indicate dimensions, weights, method of field assembly, components, features, and accessories.

3. Contractor to provide the manufacturer with accurate field dimensions where required.

4. Include wiring diagrams, power and control wiring.

F. Wiring Diagrams shall detail wiring for fixtures and differentiate between manufacturer-installed and field-installed wiring.

G. Product Certificates shall be signed by manufacturers of lighting fixtures certifying that products comply with requirements.

H. Maintenance Data shall be provided for lighting fixtures and equipment to include in emergency, operation, and maintenance manuals specified in specifications section describing Operations and Maintenance Data.

I. Field quality control test reports.

J. Special Warranties specified in this Section.

K. Review of luminaire submittals which indicate voltage, mounting condition, or quantities shall not be considered to be approval of said voltage, mounting condition, or quantities. Contractor shall field verify voltage and actual mounting condition and method.

1.7 SUBSTITUTIONS

A. Substitutions will not be considered.

1.8 COORDINATION

A. Coordinate layout and installation of light fixtures with ceiling system and other construction that penetrates ceilings or is supported by them including mechanical system, fire suppression, AV, and partition assemblies.

B. Provide all frames, supplementary support structures, hangers, spacers, stems, aligner canopies, auxiliary junction boxes and other hardware as required for a complete and proper installation. Recessed fixtures shall have frames that are compatible with the ceiling systems.

1.9 WARRANTY

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

B. Special Warranty for LED Lighting Fixtures: A warranty must be provided by the manufacturer made out to Owner for luminaires, covering repair or replacement of defective electrical parts (including light engine, driver and power supplies) within specified warranty period indicated below.

1. Warranty Period: Five years from date of Substantial Completion.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below, or as described in the Lighting Fixture Schedule, that match product installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Glass and Plastic Lenses, Covers, Louvers, and Other Optical Parts: 10% or one dozen (whichever is less) of each type and rating installed. Furnish at least one of each type.

2. LED light engines, drivers, and power supplies: 10% extra individual modular LED strips or replaceable source modules, drivers and power supplies. If product does not have replaceable components, furnish at least 10% extra entire fixture assembly. Furnish at least one of each type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Catalog series numbers shown on the Lighting Fixture Schedule on the drawings represent the type and style of fixture. The fixture size shall correspond with the actual length of the fixture as indicated on the drawings.

B. Numbers are a design series reference and do not necessarily represent the exact catalog number, size, voltage, wattage, CCT, CRI, type of driver, finish trim, ceiling type, mounting hardware or special requirements as specified as required by the particular installations. Acceptable manufacturers and series numbers are listed. The manufacturer listed shall provide complete fixtures equaling or exceeding the written specifications. Verify these requirements and order fixtures as required for a complete and fully operational installation per the contract documents and per code.

2.2 GENERAL MATERIAL REQUIREMENTS

A. Fixtures shall be free of light leaks while providing sufficient ventilation of LED sources to provide the required photometric performance. Drivers and transformers/power supplies shall be adequately vented.

B. Lampholders shall hold lamps securely against normal vibration and maintenance handling.

C. Light fixtures which require protective shielding shall be furnished with a tempered glass lens or approved unbreakable lens UL listed for the application.

D. Metal parts shall be free from burrs, sharp corners, and edges. Metal work shall be free from tool marks and dents and shall have accurate angles bent as sharply as compatible with the gauges of the required metal. Intersections and joints shall be formed true and of adequate strength and structural rigidity to prevent any distortion after assembly. All miters shall be in accurate alignment with abutting intersection members.

E. Sheet metal components shall be steel, unless otherwise indicated. Components shall be formed and supported to prevent warping and sagging. Luminaires to be painted after fabrication. Finish ferrous mounting hardware and accessories to prevent corrosion and discoloration to adjacent materials.

F. Fixture hardware to comply with the following material standards: For steel and aluminum fixtures, all screws, bolts, nuts and other fastening and latching hardware shall be cadmium or equivalent plated. For stainless steel fixtures, all hardware shall be stainless steel. For bronze fixtures, all hardware shall be stainless steel or bronze.

G. Doors, frames, and other internal access shall be smooth operating, and free from light leaks under normal operating conditions.

H. Provide supplemental safety device or arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during maintenance and when secured in operating position. Safety devices shall be detachable if necessary and shall not interfere with fixture performance, maintenance, or the seating of any fixture element. Safety device shall not be visible during normal fixture operation and from normal viewing angles.

I. Luminaires provided must have means for disconnection from power during service, as required in the NEC Article 410.

J. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 90 %.

K. Lenses, Diffusers, Covers, and Globes shall be 100 % virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.

1. Plastic, polycarbonate and acrylic shall be UV stabilized and shall have high resistance to yellowing and other changes due to aging, exposure to heat and ultraviolet radiation.

2. Lens Thickness shall be 0.125” (3 mm) unless other thickness is indicated.

3. Lenses shall have uniform brightness throughout the entire visible area.

L. Each lighting fixture having an oval shape beam pattern or a spread lens that defines beam orientation shall contain locking devices to insure that orientation is not disturbed during future maintenance or cleaning.

M. All fixtures and drivers must operate within the temperature limits of their design and as specified by Underwriters’ Laboratories, Inc. in the applications and mounting conditions herein specified.

N. Provide wire guards where specified.

O. Fixtures for use outdoors or in areas designated as damp locations shall be suitably gasketed to prevent the entrance of moisture. Provide approved wire mesh screens for ventilation openings. Dissimilar metals shall be separated by non-conductive material to prevent galvanic action.

P. Welding shall be done with electrodes and/or methods recommended by the manufacturers of the metals being welded. Welds shall be continuous, except where spot welding is specifically permitted. Welds exposed to view shall be ground flush and dressed smooth. All welds on or behind surfaces which will be exposed to view shall be done so that finished surface will be free of imperfections such as pits, runs, splatter, cracks, warping, dimpling, depressions or other forms of distortion or discoloration. Remove weld spatter and welding oxides from all welded surfaces.

Q. Electromagnetic-Interference Filters shall be factory installed to suppress conducted electromagnetic-interference as required by MIL-STD-461E. Fabricate light fixtures with one filter on each driver indicated to require a filter.

2.3 LIGHT EMITTING DIODE (LED) FIXTURES

A. All Luminaires:

1. Comply with IES LM79 and IES LM80 LED product testing procedures, and DOE Energy Star criteria.

2. Luminaires shall not draw power in the off state. Luminaires with integral occupancy, motion, photo-controls, or individually addressable fixtures with external control and intelligence are exempt from this requirement. The power draw for such luminaires shall not exceed 0.5 watts when in the off state.

3. Color spatial uniformity shall be within .004 of CIE 1976 diagram.

4. Color maintenance over rated life shall be within .007 of CIE 1976.

5. White LED luminaires shall achieve a minimum CRI of 80, and R9 value above 24, and Binning of white LEDs used in the luminaires shall fall within a 3-step MacAdam ellipse minimum, or as indicated in the Lighting Fixture Schedule.

6. Luminaire manufacturers shall adhere to device manufacturer guidelines, certification programs, and test procedures for thermal management

7. LED package(s)/module(s)/array(s) used in qualified luminaires shall deliver at least 70% of initial lumens, when installed in-situ, for a minimum of 50,000 hours.

B. Power Supplies and Drivers:

1. Power Factor 0.90 or higher

2. Operating temperature: minimum of -20°C or below when used in luminaires intended for outdoor use.

3. Maximum driver case temperature not to exceed driver manufacturer recommended in-situ operation.

4. Output operating frequency: 120Hz.

5. Interference: EMI and RFI compliant with FCC 47 CFR Part 15.

6. Total Harmonic Distortion Rating: Less than 3%, or as specified in the Light Fixture Schedule.

7. Meet electrical and thermal conditions as described in LM-80 Section 5.0.

8. Primary Current: Confirm primary current with Electrical Drawings.

9. Secondary Current: Confirm secondary current specified by individual luminaire manufacturers.

10. Compatibility: Certified by manufacturer for use with individually specified

luminaire and individually specified control components.

11. Solid-state control components to be integral or external per each specified luminaire. Remote control gear to be enclosed in Class 1, Class 2, or NEMA 3R enclosures as required.

2.4 WIRING

A. All wiring shall be as required by code for fixture wiring.

B. All flexible cord wiring between fixture components or to electrical receptacles and not in wireways shall have a minimum temperature rating of 105 degrees Celsius.

C. Cords shall be fitted with proper strain reliefs and watertight entries where required by application.

D. No internal wiring shall be visible at normal viewing angles.

2.5 FIXTURE SUPPORT COMPONENTS

A. Comply with specification sections describing Basic Materials and Methods and Supporting Devices for fixture support and bracing.

B. Single-Stem Hangers shall be 1/2-inch steel tubing with swivel ball fitting and ceiling canopy. Finish shall be the same as the luminaire.

C. Rod Hangers shall be 3/16-inch minimum diameter, cadmium-plated threaded steel rod.

D. Wires shall be ASTM A 641/A 641M, Class 3, soft temper, zinc coated steel, 12 gauge.

E. Wires for humid spaces shall be ASTM A 580/A 580M, composition 302 or 304, annealed stainless steel, 12 gauge.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer’s written instructions and approved submittal materials.

B. Mounting height indicated in drawings from finished floor to bottom of pendant light fixture or to the center of the outlet box for wall mounted light fixtures unless otherwise noted. Verify mounting heights with Architect and Engineer.

C. Mounting height may also be indicated as the length of the pendant below finished ceiling.

D. Verify weight and mounting method of all fixtures prior to ordering and provide suitable support. Coordinate with General Contractor for fixtures that require additional blocking or support and provide required support. Fixture mounting assemblies shall comply with all local seismic codes and regulations.

E. Wire per requirements of branch circuit installation. Properly ground each fixture.

F. Install fixtures with vent holes free of air blocking obstacles.

3.2 FIXTURE SUPPORT

A. Comply with specification sections describing Basic Materials and Methods and Supporting Devices for fixture support and bracing.

B. Provide all necessary hanging or mounting devices for all fixtures, verify the type needed for various ceiling conditions. Plaster rings shall be provided where required.

C. Metal decking shall not be pierced for luminaire support.

3.3 LED FIXTURES

A. Adhere to manufacturers installation guidelines regarding proper thermal management.

3.4 LIGHTING CONTROL

A. Provide branch circuiting in coordination with lighting control requirements of specification section describing lighting control equipment and as indicated on Electrical Drawings.

3.5 CLEANING AND ADJUSTING

A. Remove protective plastic covers from light fixtures and fixture diffusers only after construction work, painting and clean-up are completed. Remove, clean, and reinstall all dirty lamps, reflectors and diffusers.

B. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer for cleaning Alzak reflectors, anti-microbial finishes, and other surfaces.

C. Fixtures, reflectors, and accessories which are damaged, blemished, or impregnated with fingerprints shall be replaced at the contractor's expense. All finishes shall be unmarred upon project completion.

3.6 FIELD QUALITY CONTROL

A. Coordinate all testing procedures and schedule with the specification section describing Inspections, Testing and Start-up. All testing is to be documented with test procedures, results and initials of witnessing personnel and submitted to the Engineer and included in the O&M Manual.

B. Coordinate inspection and testing of Lighting Fixtures with specification section for lighting control equipment.

C. Inspect each installed fixture for damage. Replace damaged fixtures and components.

D. Replace all inoperative LED modules and/or sources at the end of construction prior to Owner occupancy.

E. Advance Notice: Give dates and times for field tests.

F. Provide instruments to make and record test results.

G. Test as follows:

1. Verify proper operation, switching and phasing of each fixture after installation.

2. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation. Verify normal transfer to generator and retransfer to normal.

3. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to the lighting system, retest to demonstrate compliance with standards.

H. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

END OF SECTION 265100

SECTION 270000 - GENERAL COMMUNICATIONS PROVISIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

Scope of Work.

1. Intent of Drawings.
2. Definitions.
3. General Standards of Materials.
4. Products and Substitutions.
5. Applicable Codes.
6. Guarantees and Certificates.
7. Quiet Operation and Vibration Control.
8. Temporary Shutdown of Existing Systems.
9. Coordination.
10. Shop Drawings, Product Data, and Samples.
11. Owner Instruction.

1.03 SCOPE OF WORK

A. The scope of the work included under Division 27 of the specifications shall include complete systems as shown in the Contract Documents and specified herein. Any work reasonably inferable or required to result in a complete installation or the intended operation and performance of the systems, shall be included in the Base Bid except where there is specific reference to exclusion and incorporation in other quotations.

1.04 INTENT OF DRAWINGS

A. Provide complete and functional systems for the project. The systems shall conform to the details stated in the specifications and shown on the drawings. Items or work not shown or specified, but required for complete systems, shall be provided and conform with accepted trade practices. The drawings and specifications are presented to define specific system requirements and serve to expand on the primary contract requirements of providing complete systems. The drawings are diagrammatic and indicate the general arrangement and routing of the systems included in this contractor’s work.

B. Do not scale the drawings. Because of the scale of the drawings, it is not possible to indicate offsets, fittings, valves, or similar items which may be required to provide complete operating systems. Carefully investigate conditions effecting the work associated with this project. Check and verify dimensions and

existing conditions at the site. Install systems in such a manner that interferences between pipes, conduit, ducts, equipment, Engineerural and structural features are avoided. Provide items required to meet the project conditions without additional cost to the owner.

C. These documents may not explicitly disclose final details required for a complete systems installation; however, contractors shall possess the expertise to include the necessary appointments of complete operating systems.

D. Contractors shall be “Experienced” (as defined in Division 1) in this type of construction and realize the extent of the work required.

E. BICSI Certification of Workers

1. The contractor will employ a minimum of one Registered Communications Distribution Designer (RCDD) certified by and in good standing with BICSI. This RCDD must be a direct full time employee of the contractor and the contractor will continue a minimum of one RCDD throughout the duration of the project. An RCDD shall remain assigned to the project from start to finish and be available to provide guidance to the installation team.
2. Manufacturer shall be able extend a 25-year Static, Dynamic and Applications Warranty to the end user once the Telecommunications contractor fulfills all requirements under manufacturer’s Program. At least 30 percent of the copper installation and termination crew must be certified by the Manufacturer or by BICSI with a Technician Level of training.

1.05 DEFINITIONS

A. Specific terminology, as used herein, shall have the following meanings:

1. “Finished Space” …Space other than mechanical rooms, electrical rooms, furred spaces, pipe chases, unheated spaces immediately below roof, space above ceilings, unexcavated spaces, crawl spaces, tunnels, and interstitial spaces.
2. "Conditioned"...Spaces directly provided with heating and cooling.
3. "Unconditioned"...Spaces without heating or cooling including ceiling plenums.
4. "Indoors"...Located inside the exterior walls and roof of the building.
5. "Outdoors"...Located outside the exterior walls and roof of the building.

1.06 GENERAL STANDARDS OF MATERIALS

A. Equipment and materials, unless otherwise noted, shall be new and of first quality, produced by manufacturers who have been regularly engaged in the manufacture of these products for a period of not less than five years.

B. Equipment of one type shall be the products of one manufacturer; similar items of the same classification shall be identical, including equipment, assemblies, parts and components.

C. Materials furnished shall be determined safe by a nationally recognized testing organization, such as Underwriters' Laboratories, Inc., or Factory Mutual

Engineering Corporation, and materials shall be labeled, certified or listed by such organizations. Where third party certification is required for packaged equipment, the equipment shall bear the appropriate certification label.

D. With respect to custom made equipment or related installations which are constructed specially for this project, the manufacturer shall certify the safety of same on the basis of test data. The Owner shall be furnished copies of such certificates.

1.07 PRODUCTS AND SUBSTITUTIONS

A. Where a specific manufacturer's product is specified, the Contract Amount shall be based on that product only. Any substitutions from the specified product shall be offered as a Substitution Request. Refer to Division 1 for requirements. Substitutions shall not be permitted after the bidding phase without a Substitution Request Form included with the bid.

B. Where several manufacturers' products are specified, the Contract Amount shall be based upon the specified products only. Any substitutions from the specified products shall be offered as a Substitution Request. Refer to Division 1 for requirements. Substitutions shall not be permitted after the bidding phase without a Substitution Request Form included with the bid.

C. Where only one manufacturer's product is specified, the associated systems have been designed on the basis of that product. Where several manufacturer's products are specified, the associated systems have been designed on the basis of the first-named manufacturer's product. When products other than those used as the basis of design are provided, the contractor shall pay additional costs related to submissions review, redesign, and system and/or structure modifications required by the use of that product.

D. It is the intent of these specifications that service organizations follow the above substitution procedures.

1.08 APPLICABLE CODES

A. Materials furnished and work installed shall comply with applicable codes listed in Division-26 Section, “Basic Materials and Methods,” with the requirements of the local utility companies, and with the requirements of governmental departments or authorities having jurisdiction.

1.09 GUARANTEES AND CERTIFICATES

A. Defective equipment, materials or workmanship, including damage to the work provided under other divisions of this contract resulting from same, shall be replaced or repaired at no extra cost to the Owner for the duration of the stipulated guarantee periods.

1. Unless specifically indicated otherwise, the duration of the guarantee period shall be two (2) years following the date of Substantial Completion. Temporary operation of the equipment for temporary conditioning, testing, etc., prior to occupancy will not be considered part of the warranty period.

1.10 QUIET OPERATION AND VIBRATION CONTROL

A. Equipment and associated items shall operate under conditions of load without sound or vibration deemed objectionable by the Engineer. In the case of moving equipment, sound or vibration noticeable outside of the room in which it is installed, or noticeable within the room in which it is installed, shall be deemed objectionable. Sound or vibration deemed objectionable shall be corrected in an approved manner at no extra cost to the Owner. Vibration control shall be provided by means of approved vibration isolators and installed in accordance with the isolator manufacturer's recommendations.

B. The sound pressure levels around mechanical and electrical equipment (fans, pumps, motors, etc.) in equipment spaces shall not exceed 85 dBA at any point three (3) feet from the equipment, with all equipment in the room operating. The sound criteria applies to the complete range of each piece of equipment.

1.11 TEMPORARY SHUTDOWN OF EXISTING SYSTEMS

A. Plan installation of new work and connections to existing work to insure minimum interference with regular operation of existing systems. Some temporary shutdown of existing systems may be required to complete the work.

B. Submit to the Owner in writing for approval, proposed date schedule, time, and duration of necessary temporary shutdowns of existing systems. Submit schedule at least fifteen (15) calendar days in advance of intended shutdown. Shutdowns shall be made at such times as shall not interfere with regular operation of existing facilities and only after written approval of Montgomery College Project Manager. The Montgomery College Project Manager reserves the right to cancel shutdowns at any time prior to the shutdowns. To insure continuous operation, make necessary temporary connections between new and existing work. Bear costs resulting from temporary shutdowns and temporary connections. No additional charges shall be allowed for Montgomery College Project Manager-canceled shutdowns that must be rescheduled.

C. Shutdowns must be performed by the Montgomery College Project Manager. Do not shut-down any system. The Montgomery College Project Manager reserves the right to require a walk-through of any shutdown prior to the shutdown. Following electrical shutdowns, verify that affected motors are rotating in the proper direction. Bear costs associated with reverse rotated motors.

1.12 COORDINATION

A. Coordinate and furnish in writing to the Engineer information necessary to permit the work to be installed satisfactorily and with the least possible interference or delay.

B. Coordination drawings shall be developed from individual system shop drawings and contractor fabrication drawings. Electronic or other reproduced engineering design drawings used as coordination drawings are not acceptable.

C. When work is installed without proper coordination, changes to this work deemed necessary by the Engineer shall be made to correct the conditions without extra cost to the Owner.

D. The value of the coordination drawings shall be identified as a line item in the Schedule of Values. If the coordination drawings are not submitted as required, their value shall be credited to Owner in accordance with the provisions of Article 7 of the General Conditions. The value of coordination drawings shall be a minimum of two (2.0) percent of this Contract Amount.

1.13 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. Shop drawings, product data, and samples shall be submitted in accordance with the provisions of Division 26 Section, "Basic Electrical Materials and Methods.".

B. The following shall be submitted by the Contractor for review:

1. Scale shop drawings showing system components with sizing indicated, including but not limited to:

a. equipment locations
b. raceways
c. insert and sleeve locations
d. hangers, anchors and guides
e. expansion joints
f. access doors

2. Product data for system components and materials (including construction standards).
3. Samples of finishes and trim exposed to view, such as fixture trim, escutcheon plates and similar items.

C. The value of shop drawings, product data and samples shall be identified as a line item in the Schedule of Values. If the shop drawings, product data and samples are not submitted as required, their value shall be credited to Owner in accordance with the provisions of Article 7 of the General Conditions. The value of these items shall be a minimum of one (1.0) percent of this Contract Amount.

1.14 OWNER INSTRUCTION

A. After final tests and adjustments have been completed, furnish the services of qualified personnel to instruct representatives of the Owner in the operation and maintenance procedures for equipment and systems installed as part of this project. Operation and maintenance instructions for major items of equipment shall be directly supervised by the equipment manufacturer's representative. Supply qualified personnel to operate equipment for sufficient length of time as required to meet governing authorities' operation and performance tests and as required to assure that the Owner’s representatives are properly qualified to take over operation and maintenance procedures. Minimum instruction period shall be 20 man hours. The instruction period shall be broken into segments at the discretion of the Owner.

1. Notify the Engineer, the College Project Manager and equipment manufacturers' representatives, by letter, as to the time and date of operating and maintenance instruction periods approved by the Owner at least one (1) week prior to conducting same.
2. Forward to the Engineer the signatures of all those present for the instruction periods.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 270000

SECTION 270528 - CONDUIT AND BACKBOXES FOR COMMUNICATIONS SYSTEMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Provide all materials and labor for the installation of a pathway system for inside plant communications circuits. This section includes requirements for horizontal and building backbone raceways, fittings, and boxes specific to communications circuits (cabling) for voice and data.

B. Related Sections:

1. Division 27 Section — "General Communications Provisions"
2. Division 27 Section — "Voice Data Video Cabling"

1.03 REFERENCES

A. Incorporate by reference the applicable portions of the following specifications, standards, codes into this specification section.

1. General:

a. National Electrical Code (NEC)
b. National Electrical Safety Code (NESC)
c. Occupational Safety and Health Act (OSHA)

2. Communications:

a. ANSI/TIA/EIA - 568: *Commercial Building Telecommunications Cabling Standard*
b. ANSI/TIA/EIA - 569: *Commercial Building Standard for Telecommunication Pathways and Spaces*
c. ANSI/TIA/EIA - 606: *The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings*
d. ANSI/TIA/EIA - 607: *Commercial Building Grounding and Bonding Requirements for Telecommunications*
e. ISO/IEC IS 11801: *Generic Cabling for Customer Premises*
f. BICSI: *BICSI Telecommunications Cabling Installation Manual*
g. BICSI: *BICSI Telecommunications Distribution Methods Manual (TDMM)*

1.04 DEFINITIONS

A. “IMC” shall mean Intermediate Metal Conduit.

B. “RMC” shall mean Rigid Metal Conduit.

C. “SMR” shall mean Surface Metal IMC Raceway.

D. “Raceway” shall mean any enclosed channel for routing wire, cable or busbars.

E. "TMGB" shall mean *Telecommunications Main Grounding Busbar.* There is typically one TMGB per building, located in the main telecommunications room. This busbar is directly bonded to the electrical service ground.

F. "TGB" shall mean *Telecommunications Grounding Busbar.* There is typically one TGB per telecommunications room. The TGB is connected both to the TMGB and to building structural steel or other permanent metallic systems.

G. "TBB" shall mean *Telecommunications Bonding Backbone.* The TBB is a conductor used to connect TMGBs to the TGBs.

H. "Pullbox" shall mean a metallic box with a removable cover, used to facilitate pulling cable through conduit runs longer than 100' or in which there are more than 180 degrees of bends.

I. "Junction box" shall mean a pullbox wherein a feeder conduit transitions to multiple distribution conduits.

1.05 SYSTEM DESCRIPTION

A. Furnish, install, and place into satisfactory and successful operation all materials, devices, and necessary appurtenances to provide a complete Raceway system as hereinafter specified and/or shown on the Contract Documents. The Raceway system shall support an ANSI/TIA/EIA and ISO/IEC compliant communications Structured Cabling System (SCS) as specified in 271500 – Voice Data Video Cabling

B. The work shall include materials, equipment and apparatus not specifically mentioned herein or noted on the Contract Documents but which are necessary to make a complete working Raceway system.

1.06 SUBMITTALS

A. Product Data & Shop Drawing Submittals: Provide submittal information for review before materials are delivered to the job site. Provide product data submittals for all products at the same time.

1. Submit a letter stating that the materials will be provided as specified, and specifically listing any items that will not be provided as specified. The letter shall also state that the Contractor has reviewed the specified items and agrees that they are applicable to this project in all respects.
2. For those items noted as allowing "or equal," and which are not being provided as specifically named, submit standard manufacturer's cut sheets or other descriptive information, along with a written description detailing the reason for the substitution.
3. Provide standard manufacturer's cut sheets and the operating and maintenance (O&M) instructions at the time of submittal review for each device in the system, regardless of whether it is submitted as specified or as an approved equal. These instructions shall detail how to install and service the equipment and shall include information necessary for rough-in and preparation of the building facilities to receive the materials.
4. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.
5. Coordination Drawings: Pathway routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved: Structural members in paths of pathway groups with

common supports. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Closeout Submittals: Provide submittal information for review as follows:

1. O&M Manual for Communications - At the completion of the project, submit all O&M information from product data submittals (above), updated to reflect any changes during the course of construction, to the College in the telecommunications-specific O&M Manual for Communications binder labeled with the project name and description.
2. Records - Maintain at the job site a minimum of one set of Record Drawings, Specification, and Addenda. Record Drawings shall consist of redline markups of drawings, specifications and spreadsheets, including maintenance hole/handhole butterfly drawings.

    a. Document changes to the system from that originally shown on the Contract Documents and clearly identify system component labels and identifiers on Record Drawings.
    b. Keep Record Drawings at the job site and make available to the Owner and Designer at any time.
    c. Keep Record Drawings current throughout the course of construction. (“Current” is defined as not more than one week behind actual construction).
    d. Show identifiers for major infrastructure components on Record Drawings.

1.07 CONTRACTOR WARRANTY:

A. Provide a Contractor-endorsed two-year service warranty against defects in materials and workmanship.

1. Provide labor attributable to the fulfillment of this warranty at no cost to the Owner.
2. The Contractor Warranty period shall commence upon Owner acceptance of the work.

1.08 QUALITY ASSURANCE

A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NEC, Article 100.
2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

B. Comply with NECA's "Standard of Installation."

C. Comply with NEC.

1.09 COORDINATION

A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

PART 2 – PRODUCTS

2.01 GENERAL

A. Materials shall consist of conduit, surface metal raceway, outlet boxes, fittings, enclosures, pull boxes, and other raceway incidentals and accessories as required for inside plant communications circuits.

2.02 MATERIALS

A. Conduit:

1. IMC. 1” minimum conduit size. Flexible metal conduit (FMC) is not acceptable.

a. Conduit: Galvanized steel tubing meeting ANSI C80.3.
b. Couplings: Steel, cast iron, or malleable iron compression type employing a split, corrugated ring and tightening nut, with integral bushings and locknuts. Indent-type and setscrew-type couplings are not permitted.

2. RMC. 1” minimum conduit size.

a. Conduit: Hot dipped galvanized steel with threaded ends meeting ANSI C80.1.
b. Couplings: Unsplit, NPT threaded steel cylinders with galvanizing equal to the conduit.
c. Nipples: Same as conduit, factory-made up to 8 inches in diameter, no running threads.

B. Sleeves: EMT conduit, with insulated throat bushings for each end

C. Surface Raceway: IMC surface raceway.

D. Outlet boxes: Minimum 4”x4” size, 2 1/8” minimum depth, with extension rings (if needed) and single gang covers (i.e.; mud rings), unless otherwise noted on the Contract Documents. Combined interior depth of outlet box, extension ring and cover shall be a minimum 2-1/2”. Stamped steel, deep drawn one piece (without welds or tab connections), galvanized, with knockouts for 1” trade size conduit or connector entrance, meeting NEMA OS 1.

1. Acceptable manufacturers:

a. Appleton, Raco, Steel City, or equal

2. Wiremold Extra Deep Switch and Receptacle Box: V5744-2 (two gang), or equal

E. Junction Boxes and Pull Boxes: Stamped steel, deep drawn one piece (without welds or tab connections), galvanized, with knockouts for conduit or connector entrance. Boxes 6”x6”x4” or larger may be code gauge fabricated steel continuously welded at seams and painted after fabrication.

1. Dry locations: meeting NEMA OS 1.
2. Wet locations: NEMA OS 3R.

F. Miscellaneous Fittings:

1. Locknuts and conduit bushings: Malleable iron

    a. Appleton, Crouse Hinds, OZ Gedney, or equal

2. Through wall seals and floor seals shall be:

    a. OZ Gedney FS and WS series, or equal.

G. Pull Strings: Plastic or nylon with a minimum test rating of 200 lb.

2.03 FIRESTOPPING

A. Material: Conform to both Flame (F) and Temperature (T) ratings as required by local building codes and as tested by nationally accepted test agencies per ASTM E814 or UL 1479 fire test in a configuration that is representative of the actual field conditions.

2.04 LABELING AND ADMINISTRATION

A. Labels: As recommended in ANSI/TIA/EIA 606. Permanent (i.e. not subject to fading or erasure), permanently affixed, typed, and created by a hand-carried label maker or an approved equivalent software-based label making system. Handwritten labels are not acceptable.

1. Hand-carried label maker:

    a. Brady: ID Pro Plus (or approved equal).

2. Labels:

    a. Brady: Bradymaker Wire Marking Labels WML-511-292 (or approved equal).

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND CABLING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Comply with TIA-569-B.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Armorcast Products Company.
    b. Carson Industries LLC.
    c. CDR Systems Corporation; Hubbell Power Systems.
    d. NewBasis.
    e. Oldcastle Precast, Inc.; Christy Concrete Products.
    f. Synertech Moulded Products; a division of Oldcastle Precast, Inc.

2. Standard: Comply with SCTE 77.

3. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
6. Cover Legend: Molded lettering, "COMMUNICATIONS."

7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
8. Handholes 12 Inches Wide by 24 Inches Long (300 mm Wide by 600 mm Long) and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of reinforced concrete.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Armorcast Products Company.
b. Carson Industries LLC.
c. CDR Systems Corporation; Hubbell Power Systems.
d. NewBasis.
e. Nordic Fiberglass, Inc.
f. Oldcastle Precast, Inc.; Christy Concrete Products.
g. Synertech Moulded Products; a division of Oldcastle Precast, Inc.

2. Standard: Comply with SCTE 77.

3. Color of Frame and Cover: Gray.

4. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
5. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
6. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
7. Cover Legend: Molded lettering, "COMMUNICATIONS".

8. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
9. Handholes 12 Inches Wide by 24 Inches Long (300 mm Wide by 600 mm Long) and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.6 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Tests of materials shall be performed by an independent testing agency.

2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor is solely responsible for the safety of the public and workers in accordance with all applicable rules, regulations, building codes and ordinances.

B. All work shall comply with applicable safety rules and regulations including OSHA. All work shall comply with the requirements of the National Electrical Safety Code (NESC) and the NEC except where local codes and/or regulations are more stringent, in which case the local codes and/or regulations shall govern.

C. All work shall comply with the standards, references and codes listed in PART 1 -- REFERENCES above. Where questions arise regarding which standards, references, or codes apply, the more stringent shall prevail.

D. All work shall comply with the requirements and recommendations of the product manufacturers. Where questions arise regarding which requirements and recommendations apply, the more stringent shall prevail.

E. Install the raceway system in a manner ensuring that communications circuits, when installed, are able to fully comply with the ANSI/TIA/EIA and other references listed in Part 1 — References, above.

F. Replace and/or repair to original (or better) condition any existing structures, materials, equipment, etc. inadvertently demolished or damaged by the Contractor during the course of construction at no additional cost to the Owner.

G. Remove surplus material and debris from the job site at the end of each work day and dispose of legally.

3.02 EXAMINATION

A. Examine surfaces and spaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.03 INSTALLATION

A. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions. Provide a raceway for each location indicated. Do not gang raceway into wireways, pullboxes, junction boxes, etc., without specific approval from the Designer.

B. Conduit:

1. Install EMT unless other conduit is shown on the Contract Documents or is required by Code.

2. Install conduit as a complete, continuous system without wires, mechanically secured and electrically connected to metal boxes, fittings and equipment. Blank-off unused openings using factory-made knockout seals.
3. Run conduit in the most direct route possible, parallel to building lines. Do not route conduit through areas in which flammable material may be stored.
4. Keep conduit at least 6 inches away from parallel runs of flues and steam or hot-water pipes or other heat sources operating at temperatures above one-hundred degrees Fahrenheit. Install horizontal conduit runs above water piping.
5. Keep conduit away from sources of electromagnetic interference as follows:

    a. 5 inches from fluorescent lighting
    b. 12 inches from conduit and cables used for electrical power distribution
    c. 48 inches from motors or transformers

6. Do not exceed 90 meters total length for a given conduit run to be used for distribution cabling (from outlet box to telecommunications room), including intermediate conduits and junction boxes.
7. Install conduit exposed, except in finished areas or unless shown otherwise on the drawings. Do not install conduit below grade/slab unless specifically shown on the Contract Documents as being installed below grade/slab.
8. Install exposed conduit in lines parallel or perpendicular to building lines or structural members except where the structure is not level. Follow the surface contours as much as practical. Do not install crossovers or offsets that can be avoided by installing the conduit in a different sequence or a uniform line.

    a. Run parallel or banked conduits together, on common supports where practical.
    b. Make bends in parallel or banked runs from same centerline to make bends parallel.

9. Conduits concealed above ceilings, furred spaces, etc., which are normally inaccessible may be run at angles not parallel to the building lines.
10. Wherever practical, route conduit with adjacent ductwork or piping and support on common racks. Base required strength of racks, hangers, and anchors on combined weights of conduit and piping.
11. Where conduits cross building expansion joints, use suitable sliding or offsetting expansion fittings. Unless specifically approved for bonding, use a suitable bonding jumper.
12. Support conduits as specified in Section "Basic Electrical Materials and Methods."

    a. Provide anchors, hangers, supports, clamps, etc. to support the conduits from the structures in or on which they are installed. Do not space supports farther apart than five feet.
    b. Provide sufficient clearance to allow conduit to be added to racks, hangers, etc. in the future.
    c. Support conduit within three feet of each outlet box, junction box, gutter, panel, fitting, etc.

13. Ream conduits to eliminate sharp edges and terminate with metallic insulated grounded throat bushings. Seal each conduit after installation (until cable is installed) with a removable mechanical-type seal to keep conduits clean, dry and prevent foreign matter from entering conduits.
14. Install a pull string in each conduit.

15. For conduits entering through the floor of a telecommunications room, terminate conduits 6” above the finished floor.
16. Do not install communications conduits in wet, hazardous or corrosive locations.
17. Where conduit is shown embedded in masonry, embed conduit in the hollow core of the masonry. Horizontal runs in the joint between masonry units are not permitted.
18. Where conduit is shown embedded in concrete, embed conduit a minimum of two inches from the exterior of the concrete. Do not place conduit in concrete less than 4 inches thick.

    a. One inch trade size conduit shall be used. Conduits sized smaller than one inch trade size conduit are not permitted embedded in concrete without approval from the College.
    b. Run conduit parallel to main reinforcement.
    c. Conduit crossovers in concrete are not permitted.

19. Where conduit exits from grade or concrete, provide a rigid steel elbow and adapter.
20. Where conduit enters a space through the floor and terminates in that space, terminate the conduit at 6” above the finished floor.
21. Where conduits terminate at a cable tray, the conduits shall be consistently terminated no more than 8” from the cable tray, and have a visually uniform appearance.
22. Where several circuits follow a common route, stagger pullboxes or fittings.
23. Where several circuits are shown grouped in one box, individually fireproof each conduit.
24. Bend and offset metal conduit with standard factory sweeps or conduit fittings. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

    a. Conduit sweeps:

        1) Sweeps shall not exceed 90 degrees.
        2) Do not exceed 180 degrees for the sum total of conduit sweeps for a section of conduit (between conduit termination points).
        3) Sweep radius shall be at least 10 times the internal diameter of the conduit.
        4) 90-degree condulets (LB’s) and electrical elbows are not acceptable.

    b. Factory-manufactured sweeps are required for bends in conduit larger than 1-¼” trade size.
    c. For bends in 1 ¼” trade size conduit and larger, field-manufactured bends (using a hydraulic bender with a 1 ¼” boot) are permitted only when factory-manufactured sweeps are not suitable for the conditions. In all other cases, factory-manufactured sweeps are required. “Hickey-bender” use is prohibited.

25. Connect conduit to hubless enclosures, cabinets and boxes with double locknuts and with insulating type bushings. Use grounding type bushings where connecting to concentric or eccentric knockouts. Make conduit connections to enclosures at the nearest practicable point of entry to the enclosure area where the devices are located to which the circuits contained in the conduit will connect.
26. Penetrations for raceways:

a. Do not bore holes in floor and ceiling joists outside center third of member depth or within two feet of bearing points. Holes shall be 1-¼" diameter maximum.
b. Penetrate finished walls and finished surfaces with a PVC or sheet metal sleeve with an interior diameter (ID) at least 1/4" greater than the outer diameter (OD) of the conduit, set flush with walls, pack with fiberglass, seal with silicone sealant.
c. Penetrate poured-in-place walls and free slabs with a cast iron sleeve (or Schedule 40 PVC black pipe sleeve for above-grade only) with retaining ring or washer. Set sleeves flush with forms or edges of slab. Pack around conduit with fiberglass and seal with silicone sealant.

27. Raceway terminations and connections:

a. Join conduits with fittings designed and approved for the purpose and make joints tight. Do not use set indent-type or screw-type couplings.
b. Make threaded connections waterproof and rustproof by applying a watertight, conductive thread compound. Clean threads of cutting oil before applying thread compound.
c. Make conduit terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
d. Cut ends of conduit square using a hand saw, power saw or pipe cutter. Ream cut ends to remove burrs and sharp ends. Where conduit threads are cut in the field, cut threads to have same effective length, same thread dimensions and same taper as specified for factory-cut threads.
e. Provide double locknuts and insulating bushings at conduit connections to boxes and cabinets. Align raceways to enter squarely and install locknuts with dished part against the box. Use grounding type bushings where connecting to concentric or eccentric knockouts.
f. Where conduits are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.

28. Install conduit sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed conduits, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

a. Where conduits pass from warm to cold locations, such as the boundaries of air conditioned or refrigerated spaces and where conduits enter or exit buildings from outdoor areas, including underground ducts or conduit runs.
b. Where otherwise required by the NEC.

29. Conduit shall be clean and dry.

C. Sleeves

1. Provide sleeves where required, sized as noted on the Contract Documents. Where not noted, sleeve sizing shall be determined by the type and quantity of cable to be routed through the sleeve per TIA/EIA 569A cable capacity standards, plus an additional 20% for future expansion.

2. Provide roto-hammering or core drilling where required for installation.
3. Seal between sleeve and wall or floor in which the sleeve is installed. Firestop all penetrations to restore wall or floor to pre-penetration fire-rating.

D. Surface IMC Raceway:

1. Provide surface IMC for all surface mounted telecommunications outlet boxes and as shown on the Contract Documents.
2. Surface raceway shall be routed parallel to and perpendicular to surfaces or exposed structural members, and follow surface contours.
3. Surface raceway color shall match as closely as possible the existing wall finish. Do not paint Surface Raceway.
4. Surface raceway systems shall be completely installed, including insulating bushings and inserts as required by manufacturer's installation requirements. Unused openings in the surface raceway shall be closed using manufactured fittings.
5. Surface raceway shall have a minimum two inch radius control at all bend points.
6. Surface raceway shall be securely supported by screws or other anchor-type devices at intervals not exceeding 10 feet and with no less than two supports per straight raceway section. Surface raceway shall be securely supported in accordance with the manufacturer's requirements. Tape and glue are not acceptable support methods.
7. Mechanically and electrically continuous surface raceway shall be bonded and grounded to the Telecommunications Grounding system.

E. Outlet Boxes:

1. Provide outlet boxes and covers as shown on the Contract Documents and as needed. Verify that the appropriate cover type and depth is provided for each type of wall and finish. Provide extension rings as needed.
2. Coordinate box locations with building surfaces and finishes to avoid bridging wainscots, joints, finish changes, etc.
3. Install boxes in dry locations (not wet, corrosive, or hazardous).
4. Attach boxes securely to building structure with a minimum of two fasteners. Provide attachments to withstand a force of one hundred pounds minimum, applied vertically or horizontally.
5. Install boxes at the following heights to the bottom of the box, except where noted otherwise:

    a. Wall mounted telephones: 48" above finished floor.
    b. Workstation outlets: 18" above finished floor.
    c. Place boxes for outlets on cabinets, countertops, shelves, and similar boxes located above countertops two inches above the finished surface or two inches above the back splash. Coordinate and verify size, style, and location with the supplier or installer of these items prior to outlet box installation.

6. Recessed mounted outlet boxes:

    a. Recess boxes in the wall, floor, and ceiling surfaces in finished areas. Set boxes plumb, level, square and flush with finished building surfaces within one-sixteenth inch for each condition. Set boxes so that box openings in building surfaces are within one-eighth inch of edge of

material cut-out and fill tight to box with building materials. Single gang opening shall extend at least to the finished wall surface and extend not more than 1/8 inch beyond the finished wall surface. Provide backing for boxes using structural material to prevent rotation on studs or joists.

b. Install floor boxes level and adjust to finished floor surface.

7. Surface-mounted outlet boxes:

a. For boxes surface-mounted on finished walls, provide Wiremold outlet box or equivalent. Cut box as necessary to accept conduit.

b. For boxes surface-mounted on unfinished walls (i.e. electrical rooms, mechanical rooms), provide 4”x4” (minimum) outlet box with single gang cover.

F. Floor Boxes:

1. Provide floor boxes as shown on the Contract Documents.
2. Set device boxes plumb, level, square and flush with floor, within 1/16” tolerance for each condition.
3. For floor boxes with combined power and telecommunications circuits, provide metal dividers to separate power from telecommunications circuits.

G. Junction Boxes:

1. Provide junction boxes as shown on the Contract Documents and as required.

a. Where sizing is not shown on the Contract Documents, size junction box length and depth according to the size of the feeder conduit in the following table:

Feeder Conduit Size	Box Length	Box Depth
1”	12”	4”
1-¼”	12”	4”
1-½”	12”	4”
2”	24”	4”
2-½”	24”	6”
3	36”	6”
3-½”	48”	6”
4”	60”	6”

b. Where sizing is not shown on the Contract Documents, size junction box width according to the following formula:

1) From the table below, select the width associated with the largest conduit on the distribution side of the box. For each additional distribution conduit, add the "Increase Width" value associated with the size of that distribution conduit to the box width for the largest distribution conduit.

   a) For example, if the distribution side of the junction box has one 1-¼" distribution conduit and three 1" distribution conduits, the total distribution-side width would be 6"+2"+2"+2"=10".

2) Repeat the above process for the feeder side of the junction box. Junction boxes are typically fed by a single conduit, therefore unless the box has more than one feeder conduit, the "Increase Width" part of the formula is unnecessary.

   a) For example, if the feeder side of the junction box has two 2" feeder conduits the total feeder-side width would be 8"+5"=13".

3) The larger of the two width calculations (distribution side vs. feeder side) shall be the width of the junction box to be provided.

   a) For example, if the distribution-side width were 10" and the feeder-side width were 13", provide a 13" wide junction box.

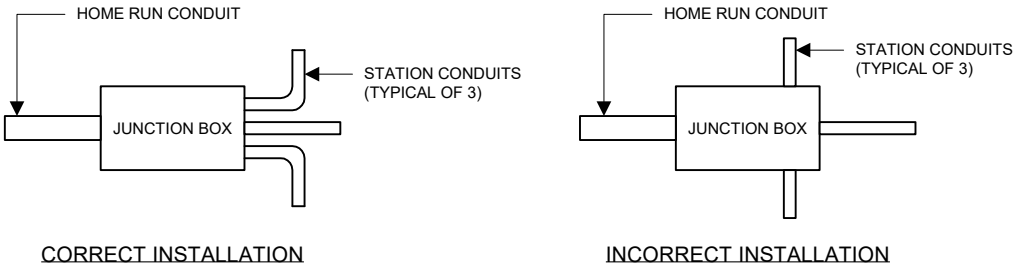
Conduit Size	Box Width	For each additional conduit Increase Width
1"	4"	2"
1-¼"	6"	3"
1-½"	8"	4"
2"	8"	5"
2-½"	10"	6"
3	12"	6"
3-½"	12"	6"
4"	15"	8"

2. A junction box may not be substituted for a 90-degree bend. *90 degree condulets (LB's) are not acceptable.*
3. Install junction boxes in a location readily accessible both at time of construction and after building occupation. Do not install junction boxes in inaccessible interstitial building spaces.
4. Where junction boxes are to be mounted on ceiling structure above ceiling grid, do not mount higher than 4' above grid.
5. Install hinged-cover enclosures and cabinets plumb, and supported at each corner.

6. Install junction boxes so that the access door opens from the side where the cable installer will normally work – typically from the bottom (floor side) of the box.

   a. Where a junction box is installed in a ceiling space, coordinate with other trades to provide full access to the junction box door and adequate working room for both the installation personnel and for proper looping of cable during installation.
   b. Provide a lockable access cover (or junction box door if junction box is exposed) in hard lid ceilings.

7. Install junction boxes such that conduits enter and exit at opposite ends of the box as follows:



CORRECT INSTALLATION INCORRECT INSTALLATION

H. Pull Boxes:

1. Provide pull boxes as shown on the Contract Documents and as required.

   a. Where sizing is not shown on the Contract Documents, size pull boxes as follows:

Size of Largest Conduit	Box Width	Box Length	Box Depth
1”	4”	12”	4”
1-¼”	6”	12”	4”
1-½”	8”	12”	4”
2”	8”	24”	4”
2-½”	10”	24”	6”
3	12”	36”	6”
3-½”	12”	48”	6”
4”	15”	60”	6”

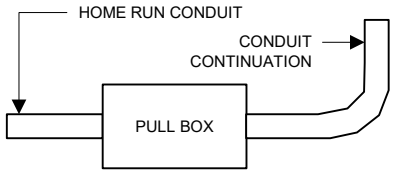
   b. Where a pull box is required with conduits 1” trade size or smaller, an outlet box may be used as a pull box. Where outlet boxes are used as

pull boxes, the outlet boxes shall be dedicated for use as a pull box and shall not host cable termination hardware.

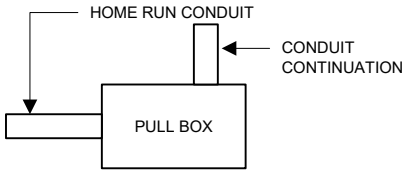
2. A pull box may not be substituted for a 90-degree bend. *90 degree condulets (LB's) are not acceptable.*
3. Install pull boxes in an accessible location, readily accessible both at time of construction and after building occupation. Do not install pull boxes in inaccessible interstitial building space.
4. Where pull boxes are to be mounted on ceiling structure above ceiling grid, do not mount higher than 4' above grid (mount on wall instead).
5. Install hinged-cover enclosures and cabinets plumb, and supported at each corner.
6. Install pull boxes so that the access door opens from the side where the cable installer will normally work (typically from the bottom, or floor side, of the box).

    a. Where a pull box is installed in a ceiling space, provide full access to the junction box door and adequate working room for both the installation personnel and for proper looping of cable during installation.
    b. Provide a lockable access cover (or pull box door if pull box is exposed) in hard lid ceilings.

7. Install pull boxes such that conduits enter and exit at opposite ends of the box as follows:



CORRECT INSTALLATION



INCORRECT INSTALLATION

I. Firestopping::

1. Only employees trained/certified by the firestopping manufacturer shall apply firestopping materials.
2. Maintain fire rating of penetrated fire-rated walls. Firestop and seal each penetration made during construction.

    a. Provide firestopping material for through and membrane penetrations of fire-rated barriers.
    b. Installation shall be performed in strict accordance with manufacturer's detailed installation procedures.
    c. Install firestops in accordance with fire test reports, fire resistance requirements, acceptable sample installations, manufacturer's recommendations, local fire and building authorities, and applicable codes and standards referenced in PART 1 – REFERENCES. Apply all sealing material in a manner acceptable to the local fire and building authorities.

J. Grounding/Bonding: Grounding and bonding work shall comply with the Virginia Uniform Statewide Building Code, Uniform Fire Code, National Electrical Code, and UL 467,

ANSI/TIA/EIA standards and the references listed in PART 1 – REFERENCES above, as well as local codes which may specify additional grounding and/or bonding requirements.

1. Bond metallic raceway together and to the nearest TGB. Ensure that bonding breaks through paint to bare metallic surface of painted metallic hardware.

3.04 LABELS:

A. Conduits: For any conduit extending beyond the space or room in which it starts, label each such conduit end in a clear manner by designating the location of the other end of the conduit (i.e. room name, telecommunications room name, pull box identifier, outlet identifier (use the label of the first port of the outlet as the outlet identifier), etc.). Indicate conduit length on the label.

1. Where a conduit is intended for future cabling use outside of the Contract, the conduit shall be labeled in a clear manner by designating the location of the other end of the conduit (i.e. room name, telecommunications room name, pull box identifier, etc.) along with a sequential number for each spare conduit terminated into a single room. Indicate conduit length on the label.

a. Suggestion: The second spare conduit (whether spare or in use) between Room 100 and telecommunications room 1A might be labeled in the telecommunications room as “Room 100 - #2, __ feet.” In Room 100 the same conduit might be labeled “1A - #2, __ feet.”

B. Pull Boxes: Label each pullbox with a unique identifier. Identifiers shall be of the form “RN-Y” where “RN” is the room name of the room closest to (or containing) the pull box, and “Y” is the sequential number of the pull box for each “RN”.

1. Example: The second pull box in the vicinity of room “100” would have the label “100-2”.

C. Pull Strings: For any conduit extending beyond the space or room in which it starts, label its pull string in a clear manner by designating the location of the other end of the pull string (i.e. room name, telecommunications room name, pull box identifier, outlet identifier (use the label of the first port of the outlet as the outlet identifier), etc.).

1. Where a pull string is installed in a conduit intended for future cabling use outside of the Contract, the pull string shall be labeled similar to the spare conduit in which it is installed.

3.05 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and in accordance with accepted industry practice, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.06 CLEANING

A. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

3.07 INSTALLATION OF UNDERGROUND CONDUIT

A Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom for pipe less than 6 inches (150 mm) in nominal diameter.
2. Install backfill.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction.

4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete for a minimum of 12 inches (300 mm) on each side of the coupling.
    b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

6. Warning Planks: Bury warning planks approximately 12 inches (300 mm) above direct-buried conduits, but a minimum of 6 inches (150 mm) below grade. Align planks along centerline of conduit.
7. Underground Warning Tape

3.08 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

C Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch (25 mm) above finished grade.

D Install handholes with bottom below frost line.

E

G. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in enclosure.

F Field cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.09 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 270544 "Sleeves and Sleeve Seals for Communications Pathways and Cabling."

3.10 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078400 "Firestopping."

3.11 PROTECTION

A. Protect coatings, finishes, and cabinets from damage or deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 270528

SECTION 270544 - SLEEVES AND SLEEVE SEALS FOR COMMUNICATIONS PATHWAYS AND CABLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Sleeves for pathway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Section 07800 "Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.01 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:

1. Material: Galvanized-steel sheet.
2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.02 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

1. Manufacturers: Subject to compliance with requirements available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Advance Products & Systems, Inc.
b. CALPICO, Inc.
c. Metraflex Company (The).
d. Pipeline Seal and Insulator, Inc.
e. Proco Products, Inc.

2. Sealing Elements: Nitrile (Buna N) rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Stainless steel.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.03 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Presealed Systems.

2.04 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.05 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
2. Sealant shall have VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.01 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pathway or cable unless sleeve seal is to be installed.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between pathway or cable and sleeve for installing sleeve-seal system.

3.02 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at pathway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.03 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

3.04 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for communications installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Section 078400 " Firestopping."

END OF SECTION 270544

SECTION 271500 – VOICE DATA VIDEO CABLING

PART 1 - GENERAL

1.01 DOCUMENT OVERVIEW:

A. The purpose of this document is to identify Montgomery College ("College") Office of Information Technology (OIT) Voice, Data, and Video Cabling Standards. The content within this document describes the minimum standards that must be met by vendors contracted by the College to complete new construction, renovation, and upgrade cabling projects.

B. The standards outlined in this document augment industry standards and do not replace them. All installations must follow BISCI and other industry standards as defined in Section 1.2. Standards Organizations in addition to the outlined methodologies and specific standards and practices outlined within this document.

C. This standard is reviewed periodically and updated accordingly to meet the most current College requirements, industry standards and technological advancements.

D. This document categorizes cabling standards as follows:

- Project deliverables and requirements
- Horizontal cabling (telecommunications closet to desktop),
- Vertical cabling (communication closet to communication closet),
- Campus cabling (building to building) and
- Communications parts and equipment. Each cabling group is sub-divided by application: Data, Voice, and Video.

E. Additional information is provided as follows:

- Telecommunication Trade Contractor Qualification Statement (Appendix "A")
- Cable Cut Sheet (Appendix "B")
- Material List (Appendix "C")
- ITV Standards for Building Installs – connector types and quantities required (Appendix "D")

1.02 STANDARDS ORGANIZATION

A. The College follows several building industry and Information Technology standards. All designs and implementations of Data, Video and Voice systems must abide by the following standards.

BICSI	Building Industry Consulting Service International
BellCore	Bell Communications Research
NEC	National Electric code
TIA	Telecommunications Industry Association
EIA	Electronics Industries Alliance
TIA/EIA-568-B.2-1	Commercial Building Telecommunications

	Cabling Standard
TIA J STD 607	Commercial Building Grounding and Bonding Requirements for Telecommunications
NFPA	National Fire Protection Association

1.03 DOCUMENTATION DELIVERABLES

A. Drawings

1. As-built drawings should be provided to the College's IT project manager upon completion of all cable plant installations.

2. Drawings shall reflect all elements of the telecommunications infrastructure or cable plant.

3. Conceptual drawings are used to convey the proposed design intent. They do not include the elements and identifiers and do not necessarily have to become part of the administration documentation.

4. Installation drawings are more detailed than the conceptual drawings and are used to document the telecommunications infrastructure to be installed. They should include the infrastructure elements and may also describe the installation methods. It is not necessary to provide identifiers on these drawings.

5. Red Line or As-built drawings document the installed telecommunications infrastructure. The As-Built drawings must be delivered to the IT Project Manager prior to the conclusion of the project. The drawings must be delivered in both CAD and PDF formats.

6. Red Line or As-built drawings are site specific and will have identifiers assigned to key elements. There may be separate drawings for other portions of the infrastructure such as pathways and spaces depending on how complex the installation is.

7. Drawings shall include:
   - All IDF and MDF rooms
   - Plan and elevation views of all IDF and MDF rooms
   - Show major pathways of cable runs
   - Equipment closets
   - Locations of conduit pull boxes
   - Wall penetrations
   - The location of all cable terminations
   - The location of all backbone cables
   - The jack number shall appear on the drawing
   - The location of all telecommunications outlets on the floor plans

B. Cabling Summary Reports: A cable summary report also called a Cut Sheet is required and at a minimum should show:
   - Cable type or function
   - Cable starting location i.e. room number and jack number
   - Cable number
   - Terminating location positions i.e. IDF / closet number, rack number, patch panel position

- Associated termination positions or cross connected to termination.

C. Labeling Sample: A sample faceplate using the College IT labeling standards as documented and displayed in Section 2.7.1 of this document is required for review by the IT Project Manager and the assigned cabling team member prior to the start of the labeling effort.

1.04 MEETING DELIVERABLES

A. Architect and Engineer Design Meeting: The Architect and Engineer (A&E) team shall contact the IT Project Manager through the College Central Facilities Office to engage appropriate College OIT resources to meet during the planning and design phases of the project. The purpose of the meetings is to resolve design and integration issues prior to reaching the construction phase.

B. Pre-Construction Conference: The Contractor MUST contact the IT Project Manager to schedule a mandatory pre-construction conference prior to any cable installation work commencing. The conference shall include contractor, College Facilities and OIT personnel and review scope of work, milestones, timelines and other items as appropriate.

1.05 CABLING INSTALLATION COMPLIANCE AND APPROVALS

A. Installation Compliance

- New installations of voice, data and video cabling must comply with this standard.
- Refurbishment and upgrades of existing cabling must comply with this standard.
- All cable installations and upgrades must be properly documented as per this standard.

B. Installation Approval: The IT Project Manager will collect all appropriate operational group approvals prior to any cable installation work commencing.

C. Manufacturer Warranty

- The College requires the vendor to provide to the College a manufacturer’s warranty certificate for a twenty five (25) year warranty on all Molex copper cable plant infrastructures installed as a part of this project.
- The College requires the vendor to provide to the College a manufacturer’s warranty certificate for a twenty five (25) year warranty on all Sumitomo FutureFLEX Air-Blown Fiber (ABF) cable plant infrastructure installed as a part of this project.

PART 2 – STANDARDS

2.01 HORIZONTAL CABLING

A. Horizontal cables are the cables that extend from the work area outlet, horizontally through the wall/ceiling/floor and then to the appropriate patch panel, termination block, or video amplifier in the Intermediate Distribution Field (IDF) room or the Main Distribution Field (MDF). These rooms may also be referred to as Telecommunication rooms or Equipment rooms. Horizontal cabling also

includes the patch cords at the work area outlet, and patch cords in the MDF / IDF.

B. Horizontal Data Cable

1. Data cable selection is dependent upon the network technologies utilized. The College standard for horizontal data cable is plenum rated blue jacketed category 6 cable which supports the following Ethernet standards: 10Base-T, 100Base-T and 1000Base-T, and meets or exceeds the warranty requirements of Molex Premise networks.
2. The quality of the data transmission depends upon the performance of the components of the channel. All cable components (including jacks, patch cables, patch panels, and cross-connects) must meet CAT6 specs.
3. Data cabling shall be routed through the horizontal installation pathway via wire trays, ladder racks, 'J' hooks, conduits (standard conduit size ¾" EMT to a single gang communications drop) or ceiling straps.
4. The following must be observed when installing category 6 cable:
   - All horizontal copper data cable runs shall be continuous runs, with no splices, with no length exceeding 295 feet or 90 meters.
   - All cable runs must maintain 10 foot service loops at both ends of the cable. The service loops at the work area end of the cable is placed in the ceiling.
   - All cables must be labeled according to the labeling section of this document.

C. Horizontal Voice Cable

1. The College standard for horizontal voice cable is plenum rated white jacketed category 6 cable.
2. All cable components must meet CAT6 specs including jacks, patch cables, rack mount 110 blocks, and cross-connects.
3. Voice cabling shall be routed through the horizontal installation pathway via wire trays, ladder racks, 'J' hooks, conduit, or ceiling straps.
4. The following must be observed when installing category 6 cable for voice systems:
   - All horizontal copper voice cable runs shall be continuous runs, with no splices, with no length exceeding 295 feet or 90 meters.
   - All cable runs must maintain 10 foot service loops at both ends of the cable. The service loops at the work area end of the cable is placed in the ceiling. Service loops in the MDF or IDF must be neatly coiled and tied to the cable tray or ladder rack system.

Service Loop Sample

- All cables must be labeled according to the labeling section of this document.
- Horizontal voice cabling shall be terminated onto 110 rack mounted style blocks meeting the Category 6 standard.

2.02 VERTICAL CABLING

A. Vertical cable systems provide interconnections between IDF rooms and MDF rooms within a building. It includes backbone cables, cross-connects, mechanical terminations and patch cords or jumpers used for backbone-to-backbone cross-connections. Vertical cabling is commonly referred to as “riser cable”.

B. Vertical cabling will be laid out in a star topology so that each IDF room is connected to the MDF room.

C. Vertical Data Cable: The College standard for vertical data communication cable is multi-mode fiber optic cable (50 micron) terminated with “SC” connectors.

- Data cabling will be routed through the vertical installation pathway via wire trays, ladder racks and /or conduit.
- All vertical cabling must be labeled as defined in the labeling section of this document.

D. Vertical Voice Cable: Vertical Voice riser cabling is the cable that extends from MDFs to IDFs. The College standard for vertical cabling of MDF’s to IDF’s for voice communications is bundled category 5e cat5e unshielded twisted pair cabling in 25 pair bundles.

- The tie cable between floors should be Cat5e 25 pair bundles.
- All vertical voice cabling must be terminated in CAT5 cat5e rack mount 110 block.
- All cable runs must maintain 10 foot service loops at both ends of the cable. Service loops must be neatly coiled and tied to the cable tray or ladder rack system.

- All voice cable runs shall be continuous runs, with no splices, with no length exceeding 295 feet or 90 meters.
- To relieve stress on the cable and to support the weight, all riser cables shall be tied to supports at each floor according to industry standards (See Section 2.4.4).

2.03 CAMPUS BACKBONE CABLING

A. The function of campus cabling is to provide connections between building MDF rooms to the campus Point of Presence (POP). Campus cabling may also be referred to as “backbone cabling”. Backbone cabling consists of Single Mode (SM) Fiber optic cable for data connections, and CAT 5 cat5e OSP rated cable – minimum of 100 pr and SM Fiber optic for telephone trunk connections.

B. Lightning protection boxes and grounding must be provided for 230 volt analog voice applications (See Appendix “C”, Item 6 for lightning box specifications).

C. Campus Backbone Cable: Campus/Backbone Cable supports data and voice connectivity between building MDF rooms and the campus Point of Presence (POP).

- The College standard backbone data cable is single-mode fiber optic cable terminated with “SC” type connector.
- All fiber optic cables shall be labeled within 4 inches of both ends with a self-laminating adhesive wire marker.
- The marker shall contain the entire cable identification information. Source Building, Closet, Rack, Fiber Shelf Destination Building, Closet, Rack, Fiber Shelf
- The College standard for fiber installations is to utilize Sumitomo Future Flex Air Blown Fiber Systems.
- The College standard telephone trunk cable is CAT5 cat5e OSP-rated in 100-pair bundles.
- Lightning protection boxes and grounding must be provided for telephone trunk cabling. (See Appendix “C”, Item 6 for lightning box specifications).

D. Outside Emergency Phones: Emergency Phones will have OSP rated Cat 5e Cable run from a Molex jack terminated inside the Emergency Phone Pedestal through outside conduit provided by the electricians to a 230 volt Lightning Protection Box inside the building. (See Appendix “C” for Material List).

2.04 MAIN DISTRIBUTION FRAME & INTERMEDIATE DISTRIBUTION FRAME

A. The main communications room in a building is known as the Main Distribution Frame or MDF. The MDFs are located where conduits from the campus Point of Presents (POP) are terminated. MDF facilities provide the initial connectivity point between the building and the campus Point of Presents. MDFs house infrastructure equipment and electronics required to terminate and distribute Data, Video and Voice services.

B. MDFs distribute services to the local communications closets also known as Intermediate Distribution Frames (IDFs).

C. All MDFs require extensive analysis to design and size. The below items are provided as information to aid in design. The College has MDFs varying in sizes from 300 square feet to 800 square feet.

- All MDFs must be sized according to the specific requirements of the building, buildings or campus it serves.
- The minimal size for an MDF is 200 square feet (10' minimum width x 20' minimum length) depending upon building requirements.
- All industry standard clearance requirements must be observed.
- Electrical sub-panels require 36 inches of access clearance.
- Wall mounted equipment requires 30 inches of access clearance.
- Two poster racks are utilized for Infrastructure equipment (See Equipment Racks section).
- Possible rack requirements include the following functions:
  - Fiber LIU
  - Telephone trunk termination
  - Vertical riser start point (fiber/copper)
  - Horizontal copper distribution
  - Cable television Termination Access Point (TAP)
- Possible systems requirements include the following:
  - Building network core infrastructure
  - Telephone PBX switch/DCS location, may also require workstation/ control station space
  - Facilities Applications end point (Access Control, HVAC, Video Surveillance, etc)
- Four poster racks, also known as cabinets, are utilized for servers. (See Section 2.4.3)
- A minimum of 24 inch deep for equipment in two poster racks.
- A minimum of 36 inches of clearance in front of equipment rows.
- A minimum of 36 inches of clearance in back of racks.
- Lighting shall be fluorescent hung parallel to the layout of equipment racks and offset to illuminate front and rear of equipment racks. Care to be given to coordinate lighting locations with cable tray and ladder rack.

D. Intermediate Distribution Frame IDF's: The communications rooms in a building that serve a specific floor or section of a building are known as Intermediate Distribution Frames or IDF's. Each work area outlet shall be connected via the horizontal cable to the horizontal cross connect (patch panel) in the IDF room. At minimum, depending on the building size and architecture constraints, each floor should have its own IDF room.

- IDFs must be 'stacked' in a multi floor building.
- All IDFs must be sized according to specific requirements of the specific space or floor it serves.
- The Riser core requires core drill between the IDF, and between MDF and IDF (see core drills section).
- The minimal size for an IDF is 150 square feet (10' minimum width x 15' minimum length) depending upon building requirements.
- IDF's accommodate local IT service infrastructure (data, voice, and video).
- Distributes services out to user end points.
- Lighting shall be fluorescent hung parallel to the layout of equipment racks and offset to illuminate front and rear of equipment racks. Care to be given to coordinate lighting locations with cable tray and ladder rack.

- All wall and floor penetrations shall be sleeved or piped.
- Install fire-stopping material around all cables passing through all wall and floor penetrations.
- Assume a minimum of 24 inch deep for equipment in two poster racks.
- A minimum of 36 inches of clearance in front of equipment rows.
- A minimum of 36 inches of clearance in back of racks.

E. MDF and IDF Power and HVAC requirements: A specific design for every MDF/IDF based upon building requirements is required. The following environmental and power concerns are minimum requirements to be incorporated into MDF/IDF designs.

- Power requirements:
  - Whenever possible connection to a building wide or dedicated emergency backup generator is preferred.
  - MDF/IDF power requirements shall be individually based on equipment & facility requirements.
  - The College has standardized on utilizing the APC Matrix series UPS systems which require one 30 amp 220 volt circuit per device terminated in a L6-30R receptacle.
    - The minimum for an MDF/IDF is two of these circuits.
  - A minimum of four 110 volt ‘household’ receptacles for user equipment is required.
- HVAC Requirements:
  - Split System HVAC units to accommodate heating and cooling 7x24x365 even when general building or central plant HVAC is not available.
  - The MDF/IDF HVAC system must be capable of making three (3) complete changes of air per hour in the MDF/IDF is required.
  - A temperature range of 62 to 72 degrees should be maintained.
  - For protection of equipment the relative humidity should be maintained at 35% + or - 10%.
  - Provide the ability to remotely monitor temperature and humidity.

F. Equipment Racks: Equipment racks are to be EIA/TIA standard 84 , 96, or 108 inch tall, 19 inch wide as specified with 8” inch cable management systems between racks and at end of all rows.

- Racks in MDF and IDFs shall be EIA/TIA 19 inch wide 7’, 8’, or 9’ tall, with 8” vertical cable management systems between each rack. Add 8” vertical cable management system to both ends of each row.
- In designing an MDF or IDF maintain Rack clearances as follows:
  - Chatsworth
    - Blue 1U markings
  - A minimum of 36” in front of each rack row.
  - A minimum of 36” between back of rows.
  - At a minimum, allow for 24” depth for equipment in the racks, in addition to the clearance requirements.
- All equipment racks must be bonded to master ground buss.
- 2u wire managers for infrastructure.
- Bolt all equipment and cable racks to the floor.
- Bolt all equipment and cable racks to the ladder racks.

- Provide one 20 amp power distribution strip in every rack. These power strips will be connected to UPS systems. (See Appendix “C”)

G. Ladder Rack, Cable Trays, ‘J’ Hook, and Beam Clamps: Horizontal pathways are the routes taken for the installation of cable from the telecommunications room to the work area. The pathways can be composed of cable trays, ladder racks, conduit, under floor duct, and ceiling spaces.

1. Cable trays are utilized for all horizontal cabling within the building and are extended into the MDFs and IDFs. Ladder racks are used to support the two poster racks, and to carry cables to/from the racks within the MDFs and IDFs. J hooks are utilized where conditions do not allow for cable trays or Ladder Racks.
2. Ladder racks: The layout of the Ladder rack system shall match the configuration of the equipment rows, with consideration for cross-aisle cabling.
   - Provide 12” minimum single tier overhead ladder racks for each row of racks. Ladder racks shall be bonded to master ground buss.
   - All ladder racks must be extended to and bolted to the wall on both ends (see illustration below).
   - Weight capacity of ladder rack system to support 40lbs per linear feet.
   - Bolt ladder racks to all cabling or equipment racks supported.
   - Ladder racks must be installed for support of all vertical cabling (for example core drills between IDFs).
   - Maintain a minimum of 4” separation between voice/data cabling and any type of power cable (AC, DC or Grounding systems).
   - The College standard for ladder racks is 12 inch single tier attached to the top of the equipment racks. Ladder racks must be sized to support requirements.

Ladder Rack Wall Mounting

Rack Grounding

3. Cable Trays:

   - The College standard for cable trays is single tier overhead Basket Style cable trays. Cable trays must be sized to support requirements. Basket Trays must be 12” or 18” wide.
   - Closed bottom tray systems are not permitted.
   - Weight capacity of the cable tray system must support 60lbs per linear foot.
   - In MDFs and IDFs, install cable tray at least 1 foot above the ladder rack system.

- Support cable tray system from above deck, horizontally brace from both sides of the cable tray.
- Utilize 90 degree sweeps when change in direction is required.
- Cable trays shall be bonded to master ground buss.
- Cable tray system must be continuous with no breaks or sharp cuts.
- In the MDF & IDFs maintain the elevation of the cable tray the same as in the hallway
- All rack and overhead framing shall be grounded and bonded.
- Maintain a minimum of 4” separation between voice/data cabling and any type of power cable (AC, DC or Grounding systems).
- The max allowable load per threaded rod supporting the cable racks is 800 lbs.
- Cable trays may be supported by:
    - Cantilever or trapeze brackets
    - Individual rod suspension (on both sides of the tray – No center supports!).
    - Supports shall meet load and span requirements of applicable electrical code.
    - Supports shall be placed on 5-foot centers.

4. J hooks and Ceiling Straps: J-hooks and ceiling straps are to be used to support telecommunications cabling within ceiling spaces. They should be spaced (to a maximum) of approximately 5 feet apart. Cable pathways should follow a prescribed route going over top of heating ducts and other conduit if possible.

2.05 CONDUITS AND CORE DRILLS

A. Conduits provide pathways between buildings for infrastructure cabling and service entrances to College facilities. Conduits are also utilized in some buildings to provide connectivity paths between MDF’s and IDF’s for cabling.

B. Underground Conduit: Provide pathways for inter-building cabling as follows:

- Standard conduit size is 5” new conduit to be installed water tight and free of obstructions.
- Conduit end locations and pathways shall be clearly mapped end to end.
- Minimum number of conduits between buildings shall be (2) 5” conduits.
- Main duct bank conduit systems shall be either 6 or 8 way (or higher) depending on the locations and number of buildings to be served.
- Conduits protruding through the floor in a MDF or IDF room shall be stubbed 4 inches above the floor surface.
- Conduits shall be terminated with insulated bushings or “No Nik” guards.
- All floor penetrations shall be sleeved or piped and fire stopped according to code.
- Whenever a conduit penetrates a fire rated wall it must be fire stopped according to code.
- Standard IT infrastructure manholes/handholds are 4’x4’x4’ at a minimum. (See Appendix “E”).

C. Building Entrances

- Minimum IT building entrance conduit for small buildings shall be two 5" conduits.
- Minimum IT building entrance conduit for large buildings serving as intermediate points shall be four 5" conduits.
- Minimum IT building entrance conduit for buildings serving as campus "Points of Presence" (POP) shall be eight 5" conduits.
- All building entrance conduits shall originate at the closest IT manhole and proceed continuously to the IT MDF within the building
- Building entrance conduits entering the building below floor level shall utilize ladder rack to provide vertical cable support as the cable enters the MDF location
- Building entrance conduits enter the building above floor level shall be continuously swept up to the horizontal cable tray or ladder rack level.
- Conduits protruding through the floor in a MDF or IDF room shall be stubbed 4 inches above the floor surface.
- All conduits shall be terminated with insulated bushings or "No Nik" guards.

D. Intra-Building Conduit

- Standard interior conduit size is 4" new conduit to be installed water tight and free of obstructions.
- Whenever a conduit penetrates a fire rated wall, it must be fire stopped according to code.
- All conduits shall be terminated with insulated bushings or "No Nik" guards.

2.06 CABLES (FIBER/COPPER/COAX)

A. The College's cable selection provides support for both current and emerging network technologies. The College currently uses three types of cable which supports Data, Voice and Video applications throughout the College. The three types of cable utilized at the College are Fiber Optic cable, Copper cable and Coax cable.

B. The current College standards are based upon:

- Fiber – Sumitomo FutureFLEX ABF System.
- Copper – Molex Premise Networks Systems.

C. Fiber Optic Cable: The College uses two types of fiber optic cable Single Mode for building to building (SM) Fiber (50/125) and Multi Mode for risers (MM) Fiber (50 microns) as defined by standards (ANSI/TIA/EIA-568-B.3) ratified by the TIA/EIA in April 2002.

D. Fiber Optic Cabling System: The College standard fiber optic cabling is the Sumitomo FutureFLEX Air Blown Fiber (ABF) cabling System, Sumitomo Electric Lightwave Corp. PO Box 13445, 78 Alexander Drive, Research Triangle Park, NC 27709 (see photo below) This systems acts as the Conduit and the Inner Duct for fiber cable.

Two Tube, Seven Tube and Nineteen Tube examples of Outdoor ABF

For more detailed information on the implementation and labeling of the ABF system, refer to Section 2.7 of this document.

E. Copper Cabling: Copper cable is to provide support for current and emerging network technologies both data (Blue) and voice (White). The College standard currently uses category 6 UTP Plenum rated cabling which supports the following Ethernet standards; 10base-T, 100base-T and 1000base-T, based upon the Molex Premise Network System, Molex Premise Networks, 2222 Wellington Court, Lisle, IL 60532.

F. Patch cords shall maintain the same standards as referenced above.

G. Fiber Cable for MCTV:

- Standard Fiber cable for MCTV in-house production is plenum rated, Sumitomo single mode fiber cable in single or multiple strands depending on the needs of the project.

Audio Cable for MCTV:

- Audio cabling (1801B)(Belden), Analog and digital rated cable, plenum rated
- Connector types Neutrik NC3MD-LX, 3 pole female- used at camera location
- Connector types Neutrik NC3FD-LX, 3 pole male- used at I/O panel at truck location

Data Port for MCTV:

- CAT6 UTP Plenum rated blue jacketed data cable for networking.

Definition of Terms:

ST Fiber Connector
A type of single mode fiber cable connector that has a twist-lock, BNC style video connection.

XLR Connector
The XLR connector is an electrical connector design. XLR plugs and sockets are used mostly in professional audio and video electronics cabling applications, often for microphones and communications.

2.07 INSTALLATION

A. This section describes specific installation methodologies as they are implemented at the College. Installation practices such as Labeling and Cable are outlined.

B. Labeling: Labeling of cables is required for all cable types within the College. As stated in Section 1.3.3 of this document, a sample of a faceplate (shown as Figure 2 below) using the College IT labeling standards as documented in this section is required for review by the IT Project Manager prior to the start of the labeling effort.

There are different standards for copper, coax, and fiber. Each label shall indicate, at a minimum, the physical address of the component, any physical extensions, and/or terminations. In addition:

- Vertical and backbone cables shall be labeled at each end.
- Horizontal cabling is labeled on the patch panel and the jacks.
- Label cables and conduits at strategic locations such as conduit ends, backbone splice points, manholes and pull boxes.
- Each cable shall have a unique identifier.
- The identifier shall be marked directly on the cable or the labels affixed to the cable.
- Labels shall be made from a durable material, such as vinyl.
- Labels shall be suitable for wrapping and bending.
- Labels shall be consistent across an installation.
- All labels shall be easy to see.
- Horizontal data, voice and video cable labeling. (See Figures 1-3 for labeling examples.)

- Label cables with the following information:
- Building code
- Room number
- Closet number
- Rack number
- Panel number
- Port number (sequential incremented per room).
- Face Plate Labeling Illustrations

Figure 1

Figure 1 depicts the standard design for cabling labels.

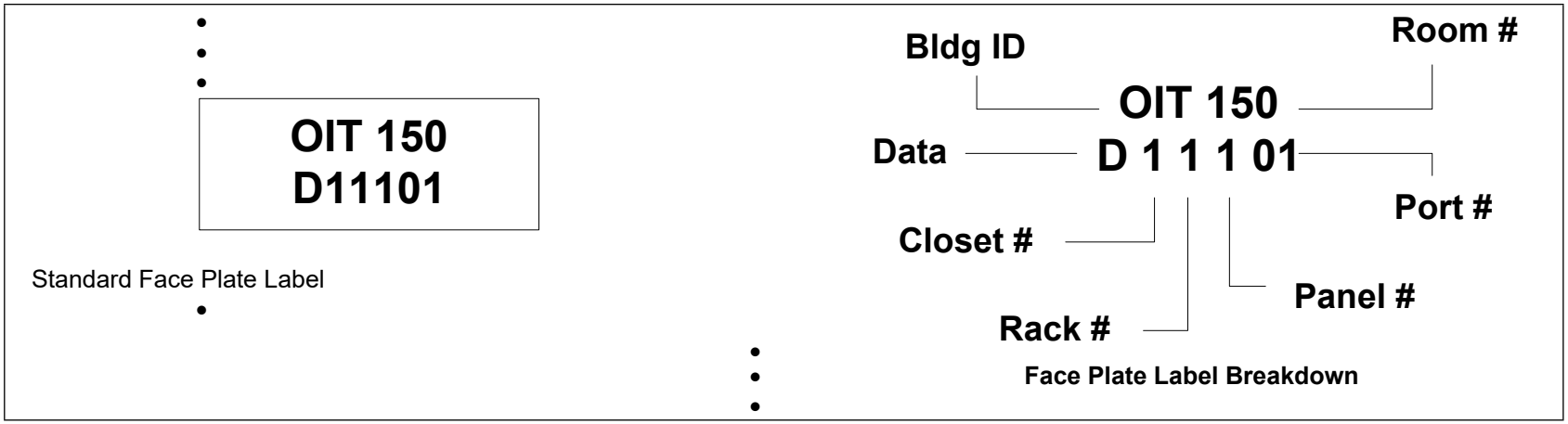


Figure 2 depicts cable labeling in a building where ‘GB’ is the building code, the room number is 112. It shows both data and voice examples. For the Data line, the closet # is ‘1’, the rack # is ‘6’, the Panel # is ‘2’ and the cables are sequentially numbered starting at ‘Port 18’ through ‘Port19’. For the Voice line, the closet # is ‘1’, the rack # is ‘3’, the Panel # is ‘2’ and the cables are sequentially numbered starting at ‘Port 14’ through ‘Port15’.

Figure 2

Figure 3 illustrates cable labeling in a building where ‘OIT’ is the building code and the room numbers are 226 and 230. Further room breakdown identifies specific wall jacks within a room referenced by a decimal number following each room number (ex. room 226, wall jack 6 and 7 and room 230, wall jack 3, 4, and 5). The figure depicts data lines where the closet # is ‘1’, the rack # is ‘1’, the Panel # is ‘3’ and the cables are sequentially numbered starting at “Port 20’ through Port24 and Port 44 through Port 48’.

Typical RJ 45 48-Port Cat 6 Patch Panel

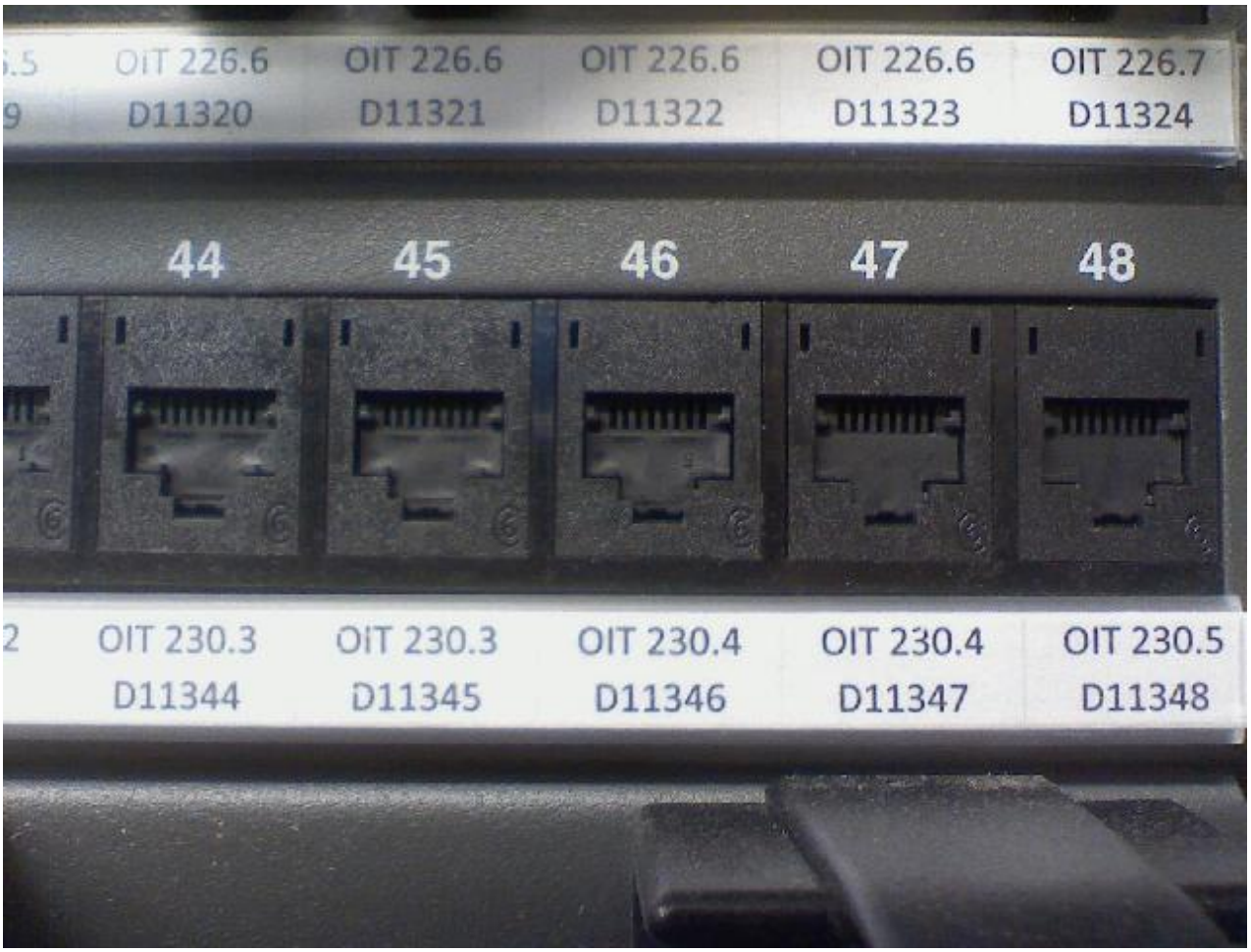

OIT 226.6
D11320
OIT 226.6
D11321
OIT 226.6
D11322
OIT 226.6
D11323
OIT 226.7
D11324
44
45
46
47
48
OIT 230.3
D11344
OIT 230.3
D11345
OIT 230.4
D11346
OIT 230.4
D11347
OIT 230.5
D11348

Figure 3

FutureFLEX Air Blown Fiber

The FutureFLEX Air Blown Fiber (ABF) cabling system consists of two components, Tubes and Cores.

Air Blown Fiber (ABF) Core Labeling:

Each Core is labeled with a unique number. Core one (1) on a campus would be labeled 'C1'.

Any given Core run may be cut within a manhole to provide a path between tubes in other cores with different destinations.

Each section of the Core (in this example Core One or 'C1') will have the sections identified as section A, B, etc. For example: A Core has three splice points between its end-points yielding four sections of core one. In this illustration the four sections would be labeled 'C1A', C1B', 'C1C' and 'C1D' respectively.

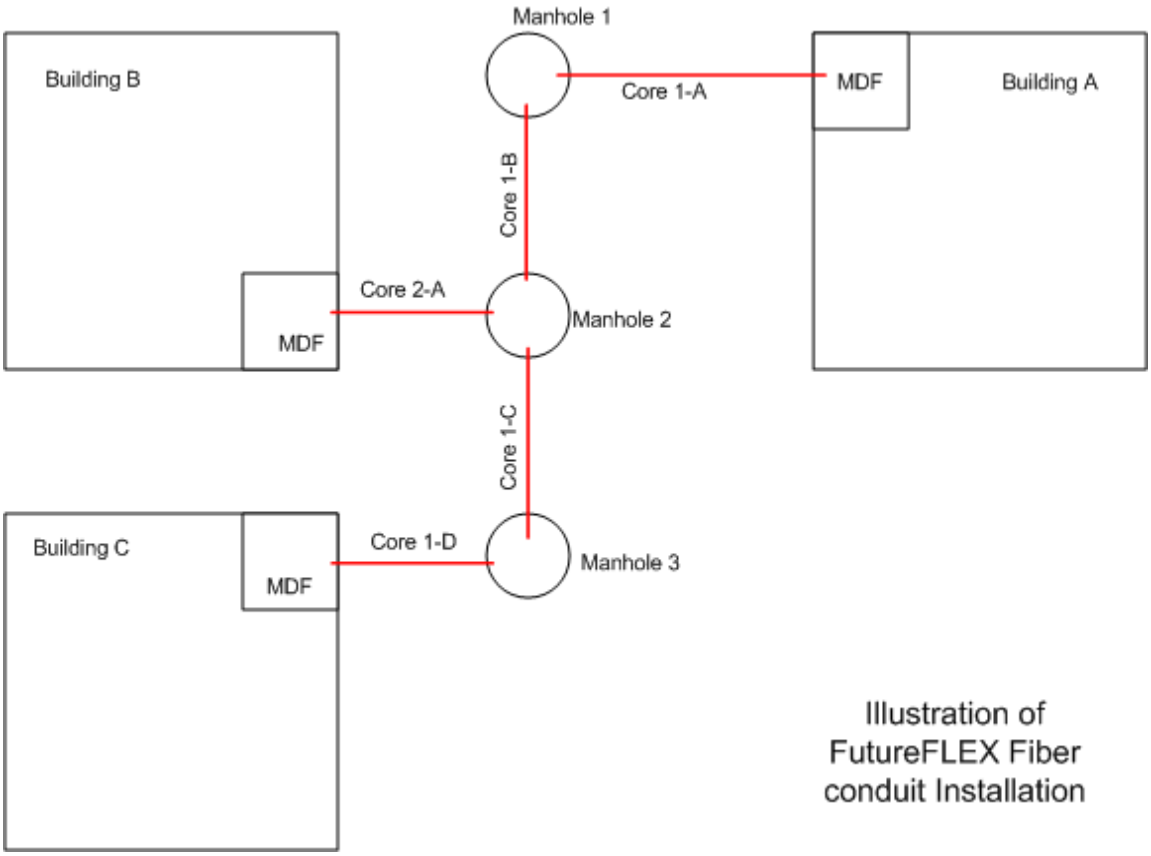


Illustration of FutureFLEX Fiber conduit Installation

ABF Tube Labeling: All within each ABF Core are to be labeled with a number starting with one (1) and incrementing (by one (1)) to the total count of that particular core. Both ends of the tubes at all splice points, must be labeled identically.

For example a seven tube core will have the tubes labeled: '1', '2', '3', '4', '5', '6' and '7'.

Riser fiber optic cable labeling: Label cables with the following information:

- Building code
- Closet room number

- Rack number
- Fiber shelf number

Backbone fiber optic cable labeling: *All backbone fiber optic cable is labeled at both ends with the termination information of the other end of the cable:*

- Label cables with the following information:
  - Building code
  - Closet room number
  - Rack number
  - Fiber Shelf number

C. Cable Testing: All new cable installations shall be tested after installation according to current Industry Standards. A written copy of all tests shall be provided to the IT Project Manager at completion of the tests. The College requires 'End-to-End' testing of all cabling plants after infrastructure equipment is installed. In the case of telephone jacks a 'dial tone' test is performed. In the case of data drops, network connectivity is tested. In case of Fiber cabling drops, sweep test is performed.

1. *Testing category 6 cable:* All Category 6 cables shall be tested to and pass ANSI/TIA/EIA 568 B.2. Tests shall utilize a Category 6 compliant cable tester. Electronic results for each cable will be submitted as part of the "As-Built" project performance acceptance records. In addition to the above information, the documentation will also include a pass/fail indication for the specified cable, the test date, the serial number and software version of the scanner, and a copy of the calibration certificate for the scanner. Necessary applications for reading the results will be provided by the requirements-refer to ANSI/TIA/EIA 568-B.2. This document can be found in the "TIA/EIA Telecommunications Building Wiring Standards." A written copy of all tests shall be provided to the IT Project Manager after completion.

2. *Testing Single Mode Fiber Optic Cable:* All single mode fiber cables shall be tested at both 1310 nm and 1550 nm after installation. Printed test results for each fiber strand are required. All tests are to be performed in accordance with ANSI/TIA/EIA-526-7, Method A.1, and One Reference Jumper. Fibers will be considered acceptable if the OTDR trace for that fiber shows an end to end loss of less than xxdB + yy (0.2)dB + zz (0.5)dB (where yy is the number of splices, zz is the number of connector pairs and xx is calculated using the following formula: xx = distance X fiber attenuation/unit distance @ lambda). In addition, no splice may show a loss of greater than 0.2 dB and no connector pairs may show a loss of greater than 0.5 dB. Any additional tests required by the ANSI/TIA/EIA standard shall also be performed and also included in the written test report.

   Each fiber strand must be tested utilizing an OTDR bi-directional tester at the wavelengths specified above. Overall, the OTDR test results shall be made up of the wavelength of the conducted test, the link length, attenuation, cable identification, and the locations of the near end, the far

end and each splice point or points of discontinuity. Hard-copy results for each fiber strand shall be submitted as part of "As- Built" documentation.

A written copy of all tests shall be provided to the IT Project Manager after completion.

3. *Testing Multi Mode Fiber Optic Cable:* All multimode fiber cables shall be tested at both 850 nm and 1300 nm after installation. Printed test results for each fiber strand are required. All tests are to be performed in accordance with ANSI/TIA/EIA-526-14A. Fibers will be considered acceptable if the OTDR trace for that fiber shows an end to end loss of less than xxdB + yy(0.2)dB + zz(0.5)dB (where yy is the number of splices, zz is the number of connector pairs and xx is calculated using the following formula: xx = distance X fiber attenuation/unit distance @ lambda). In addition, no splice may show a loss of greater than 0.2 dB and no connector pairs may show a loss of greater than 0.5 dB. Any additional tests required by the ANSI/TIA/EIA standard shall also be performed and also included in the written test report. The vendor shall test each fiber strand utilizing an OTDR bi-directional tester at the wavelengths specified above. Overall, the OTDR test results shall be made up of the wavelength of the conducted test, the link length, attenuation, cable identification, and the locations of the near end, the far end and each splice point or points of discontinuity. Hard-copy results for each fiber strand shall be submitted as part of "As- Built" documentation. If the cable fails to meet the above requirements, the contractor at the contractor's expense shall replace it. A written copy of all tests shall be provided to the IT Project Manager after completion.

4. *Testing Copper Voice Feeder Cable:* For all voice copper cable installations the cables shall be tested for the following:

   - Continuity of each conductor from end-to-end - open test.
   - Shorted conductors with other conductors - short test.
   - Proper polarity of paired conductors from end-to-end - reverse test (for correct tip & ring and data terminations).
   - Proper termination of wire pairs from end-to-end - cross test (for splits and other incorrect terminations).
   - Proper ground and shield bonding (for shielded cables only) - effective ground test (for zero potential difference bonding).
   - Grounded conductors (for all cables) - ground fault test.
   - Detection of AC or DC power on any conductor - power fault test.
   - All data cables shall be tested per EIA/TIA TSB-67 Level II requirements.
   - A maximum of 1% defective pairs will be allowed in the Outside Plant Copper Cable. For any number higher than this, the cable shall be replaced or repaired at the splice point.
   - A written copy of all tests shall be provided to the IT Project Manager after completion.

5. *Testing Copper Fiber Cable:* All testing of point to point fiber cabling will be conducted with in-house specialized communication engineers present. Testing of communication, video, audio, and tally information will be tested with appropriate cable testers and in-house equipment to ensure operability. Sweep test is required.

END OF SECTION 271500

APPENDICES

APPENDIX A

Appendix A

TELECOMMUNICATION TRADE CONTRACTOR QUALIFICATION STATEMENT

MONTGOMERY COLLEGE
Office of Information Technology (IT)

PART 1 - SUBMITTAL REQUIREMENTS

1.0 Telecommunications Trade Contractor must submit the Qualification Statement with their bid.

PART 2 - TECHNICAL EVALUATION CRITERIA

1.0 The qualification statement must provide, at a minimum, the following information.

State number of years in cable installation business. Trade Contractor's are required to have engaged in cable installation at commercial, governmental or education institutional agencies within the Metropolitan Washington area (including Baltimore) for a period of not less than 3 years. Trade Contractor's shall have currently in their employ sufficient staff to provide the required work per specifications in this Request for Proposal. State number of qualified support staff available to complete project as required.

A. Trade Contractor(s) MUST have sufficient qualified staff to accommodate project that require a minimum crew of two (2) people at the job site. A crew consists of a minimum of 1 qualified technician and 1 helper. Include a brief description on a separate sheet, of personnel that will be assigned to work on project. Copies of resumes, certifications, manufacturer training, technical schooling and background showing qualifications and length of current employment of field staff to be assigned to this contract MUST be included with this statement.

B. Trade Contractor(s) MUST be a Certified Organization or have a minimum of one (1) certified installer, or employ a Certified Sub-Contractor for each type of communication cable being installed. Certification programs as established by the manufacturers below are typical College standards;

1. **CAT 6 Copper**
    a. Molex Premise Networks, 2222 Wellington Court, Lisle, IL. 60532
2. **Fiber Optic**
    a. Sumitomo Electric Lightwave Corp. PO Box 13445, 78 Alexander Drive, Research Triangle Park, NC. 27709

Evidence of current Certifications MUST be included with your statement and MUST be maintained through the life of the contract.

C. The Trade Contractor(s) MUST provide a statement, on a separate sheet, demonstrating that they understand the scope of the work as outlined in this Bid. The Trade Contractor MUST describe the approach that they propose to use in fulfilling the College's requirements.

D. The Trade Contractor(s) MUST provide evidence of their ability to perform building-wide wiring installations of copper cabling and Category 6 unshielded twisted pair (UTP) cabling, 62.5 multi-mode and single-mode optical fiber cabling in accordance with referenced standards contained within. The Trade Contractor(s) may provide this evidence by listing three (3) prior references which had requirements similar to those required in this contract, along with the location, contact person, current telephone number, and a short narrative description detailing the scope of the project. Descriptions shall include wiring closet installation, wiring types, cable routes and supporting electrical installation (if any).

E. The prime Trade Contractor MUST employ on staff a minimum of one (1) BICSI certified RCDD designer and (1) BICSI LAN Specialist throughout the life of the contract. Copies of resumes, professional licenses, certifications, manufacturer training, technical schooling and background showing qualifications and length of current employment of field staff to be assigned to this contract MUST be included with your proposal.

F. The Trade Contractor MUST possess and demonstrate the ability to use both an Optical Time Domain Reflectometer (OTDR) and a Microtest Pentascanner or equivalent to meet the testing requirements specified elsewhere in this document. The Trade Contractor MUST provide evidence of its ability to use these testing devices by submitting samples of reports in the manner required in the cable testing section of this document.

The College shall be the sole judge in determining whether a Trade Contractor is qualified. In evaluating each telecommunication Trade Contractor, consideration shall be given to items including, but not limited to, the reputation and experience of the Trade Contractor, the quality of performance of previous contracts or services, either with the college or with other customers.

APPENDIX B

Cable Cut Sheet

Appendix B

1ST FLOOR MDF

room	configuration	jack port	type	closet	Rack	panel	port	LABEL	jack port	type	closet	rack	panel	port	LABEL
100.1	WP								A-VOICE	V	1	3	1	01	V13101
100.2	2D/1C	A-DATA	D	1	6	1	01	D16101							
		B-DATA	D	1	6	1	02	D16102							
101.1	2D/2V	A-DATA	D	1	6	1	03	D16103	A-VOICE	V	1	3	1	02	V13102
		B-DATA	D	1	6	1	04	D16104	B-VOICE	V	1	3	1	03	V13103
101.2	2D/2V	A-DATA	D	1	6	1	05	D16105	A-VOICE	V	1	3	1	04	V13104
		B-DATA	D	1	6	1	06	D16106	B-VOICE	V	1	3	1	05	V13105
101.3	2D/2V	A-DATA	D	1	6	1	07	D16107	A-VOICE	V	1	3	1	06	V13106
		B-DATA	D	1	6	1	08	D16108	B-VOICE	V	1	3	1	07	V13107
101.4	2D/2V	A-DATA	D	1	6	1	09	D16109	A-VOICE	V	1	3	1	08	V13108
		B-DATA	D	1	6	1	10	D16110	B-VOICE	V	1	3	1	09	V13109
101.5	2D/2V	A-DATA	D	1	6	1	11	D16111	A-VOICE	V	1	3	1	10	V13110
		B-DATA	D	1	6	1	12	D16112	B-VOICE	V	1	3	1	11	V13111
101.6	2D/2V	A-DATA	D	1	6	1	13	D16113	A-VOICE	V	1	3	1	12	V13112
		B-DATA	D	1	6	1	14	D16114	B-VOICE	V	1	3	1	13	V13113
101.7	WP								A-VOICE	V	1	3	1	14	V13114
102.1	2D/2V	A-DATA	D	1	6	1	15	D16115	A-VOICE	V	1	3	1	15	V13115
		B-DATA	D	1	6	1	16	D16116	B-VOICE	V	1	3	1	16	V13116
102.2	2D/2V	A-DATA	D	1	6	1	17	D16117	A-VOICE	V	1	3	1	17	V13117

		B-DATA	D	1	6	1	18	D16118	B-VOICE	V	1	3	1	18	V13118
102.3	WP								A-VOICE	V	1	3	1	19	V13119
103.1	2D/2V	A-DATA	D	1	6	1	19	D16119	A-VOICE	V	1	3	1	20	V13120
	2D/2V	B-DATA	D	1	6	1	20	D16120	B-VOICE	V	1	3	1	21	V13121
103.2	2D/2V	A-DATA	D	1	6	1	21	D16121	A-VOICE	V	1	3	1	22	V13122
	2D/2V	B-DATA	D	1	6	1	22	D16122	B-VOICE	V	1	3	1	23	V13123
103.3	2D/2V	A-DATA	D	1	6	1	23	D16123	A-VOICE	V	1	3	1	24	V13124
	2D/2V	B-DATA	D	1	6	1	24	D16124	B-VOICE	V	1	3	1	25	V13125
104.1	WP								A-VOICE	V	1	3	1	26	V13126
104.2	2D/1C	A-DATA	D	1	6	1	25	D16125							
		B-DATA	D	1	6	1	26	D16126							
105.1	2D/1C	A-DATA	D	1	6	1	27	D16127							
		B-DATA	D	1	6	1	28	D16128							
105.3	2D/2V	A-DATA	D	1	6	1	29	D16129	A-VOICE	V	1	3	1	27	V13127
		B-DATA	D	1	6	1	30	D16130	B-VOICE	V	1	3	1	28	V13128
106.1	2D/1C	A-DATA	D	1	6	1	31	D16131							
		B-DATA	D	1	6	1	32	D16132							
106.2	2D/2V	A-DATA	D	1	6	1	33	D16133	A-VOICE	V	1	3	1	29	V13129
		B-DATA	D	1	6	1	34	D16134	B-VOICE	V	1	3	1	30	V13130
107.1	2D/2V	A-DATA	D	1	6	1	35	D16135	A-VOICE	V	1	3	1	31	V13131
		B-DATA	D	1	6	1	36	D16136	B-VOICE	V	1	3	1	32	V13132
107.2	2D/2V	A-DATA	D	1	6	1	37	D16137	A-VOICE	V	1	3	1	33	V13133

		B-DATA	D	1	6	1	38	D16138	B-VOICE	V	1	3	1	34	V13134
107.3	WP								A-VOICE	V	1	3	1	35	V13135
108.1	2D/2V	A-DATA	D	1	6	1	39	D16139	A-VOICE	V	1	3	1	36	V13136
		B-DATA	D	1	6	1	40	D16140	B-VOICE	V	1	3	1	37	V13137
108.2	2D/2V	A-DATA	D	1	6	1	41	D16141	A-VOICE	V	1	3	1	38	V13138
		B-DATA	D	1	6	1	42	D16142	B-VOICE	V	1	3	1	39	V13139
108.3	2D/2V	A-DATA	D	1	6	1	43	D16143	A-VOICE	V	1	3	1	40	V13140
		B-DATA	D	1	6	1	44	D16144	B-VOICE	V	1	3	1	41	V13141
108.4	2D/2V	A-DATA	D	1	6	1	45	D16145	A-VOICE	V	1	3	1	42	V13142
		B-DATA	D	1	6	1	46	D16146	B-VOICE	V	1	3	1	43	V13143
108.5	2D/2V	A-DATA	D	1	6	1	47	D16147	A-VOICE	V	1	3	1	44	V13144
		B-DATA	D	1	6	1	48	D16148	B-VOICE	V	1	3	1	45	V13145

APPENDIX C

Appendix C

Material List
Manufacturer Contact and Part Numbers

- Chatsworth- WWW.chatsworth.com
  a. Two Poster Rack-
     - Chatsworth 19" equipment racks
     - 55053 – 703 7 foot black
     - 55053 – 715 8 foot black
     - 55053 – 708 9 foot black
  b. Vertical Cable Manager-
     - Chatsworth Master Cabling Sections (MCS)
     - 30095 – 703 7 foot black
     - 30095 – 715 8 foot black
     - 30095 – 708 9 foot black
  c. Rack Mount Power Strips-
     - Chatsworth 12816-707
     - Tripplite 12816-707
  d. Grounding
     1. Busbar- 40153-012
     2. Grounding Cable- 6 AWG
  e. Ladder Rack- 10250-712
     1. Butt-Splice kit- 11301-701
     2. Junction-Splice kit- 11302-701
     3. 3" Channel Rack to Ladder Mounting Plate- 12730-712
     4. Wall Angle Support kit- 11421-712
- B-Line- WWW.b-line.com
  a. Wire basket tray- FT2X12X10
  b. Washer splice kit- Washer SPL KIT_
  c. 90 Degree Kit- 90 DEGREE KIT_
- Caddy- WWW.erico.com
  a. Mounting plate bracket- MPLS
  b. J-Hooks- (Depends on Ceiling) View website or ask College for preference.
  c. Rings- (Depends on Ceiling) View website or ask College for preference.
- Molex- WWW.molexpn.com
  a. Faceplate
     i. 2-port- WSY-00018-02
     ii. 4-port- WSY-00002-02
     iii. 6-port- WSY-00001-02
     iv. Biscuit- SSY-00002-02
  b. Blanks- KSJ-00005-02
  c. Jacks
     i. Data- KSJ-00018-BL (Blue)
     ii. Voice- KSJ-00018-02 (White)
     iii. MCFNET- KSJ-00018-08 (Gray)
  d. Cable
     i. Data- CAA-0181P-PK (Pink)
     ii. Voice- CAA-0181P-02 (White)

e. Patch Panel- PID-00201G (Data)
f. Rack Mount 110 Blocks
    i. Cat 6 Station Voice- KPD-00080
    ii. Cat 5e Tie Cable- KPD-00061
g. Horizontal Wire Manager
    i. 1U- 25.B016G
    ii. 2U- 25.B013G
h. Fiber Box
    i. 1U(24-48 Ports)- RFR-00201
    ii. 2U(48-96 Ports)- RFR-00202
    iii. 4U(144-288 Ports)- RFR-00204
        1. 6-Pak Multimode- AFR-00360
        2. 12-Pak Multimode- AFR-00362
        3. 6-Pak Single mode- AFR-00358
        4. 12-Pak Single mode- AFR-00368
i. Patch Cords
    i. Cat6 5'- PCD-002047-OH (Pink)(Closet End)
    ii. Cat6 10'- PCD-002043-OH (Pink)(Closet/Station End)
    iii. Cat6 15'- PCD-002044-OH (Pink)(Station End)

- Sumitomo- WWW.sumitomoelectric.com
    a. Tubes
        i. 2 tube- TC02MSOS
        ii. 4 tube- TC04MSOS
        iii. 7 tube- TC07MSOS
        iv. 19 tube- TC19MSOS
        v. Clear tube from Distribution Unit to Fiber Box
    b. Fiber
        i. Single mode
            - 6 Strand FB06SX
            - 12 Strand FB12SX
            - 18 Strand FB18SX
            - 24 Strand FB24SX
        i. Multimode- (50/125)
            - 6 Strand FB06G53
            - 12 Strand FB12G53
            - 18 Strand FB18G53
            - 24 Strand FB24G53
        i. Connectors- SC
    b. Tube Distribution Unit- DE12IDU
- Lighting Protection Systems – 230 volt applications
    a. Tii Porta Systems www.tiinettech.com

i. Lightning Protection Box- 25100-110-M110PC
ii. Lightning Protection Box- 25025-110-M110PC

b. Circa Systems
i. Circa 1880ENA1/NSC-50

- Superior Essex- WWW.superioressex.com
  a. Tie Cable
     i. OSP Cat5 MEGAPIC-NF – 04-104-31 (100 Pair)
     ii. UTP Cat5e 25 Pair- 51-478-48
- Commscope- WWW.commscope.com
  a. OSP Trunk Cable- P3500JCASS
- Belden- WWW.Belden.com
  a. RG 6 Horizontal Coax- (1695A)
  b. RG 11 Vertical Coax- 7731A
- Mohawk- WWW.Mohawk.com
  a. Cat5e Outside Plant 4 pair Copper Cable- M57562
- Blonder Tongue- WWW.Blondertongue.com
  a. 8 port splitter- (LPD-8p)
  b. 8 port amplifier- specific details to be provided

SECTION 280100 – COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Electronic safety and security equipment coordination and installation.
2. Sleeves for raceways and cables.
3. Sleeve seals.
4. Grout.
5. Common electronic safety and security installation requirements.

1.03 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.04 SUBMITTALS

A. Product Data: For sleeve seals.

1.05 COORDINATION

A. Coordinate arrangement, mounting, and support of electronic safety and security equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for electronic safety and security items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Section "Access Doors and Frames."

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Section "Firestopping."."

PART 2 - PRODUCTS

2.01 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel.

1. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.02 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Metraflex Co.
d. Pipeline Seal and Insulator, Inc.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
3. Pressure Plates: Carbon steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.03 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.01 COMMON REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electronic safety and security equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.02 SLEEVE INSTALLATION FOR ELECTRONIC SAFETY AND SECURITY PENETRATIONS

A. Electronic safety and security penetrations occur when raceways, pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 2 inches (50 mm above finished floor level.

G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section "Joint Sealants."

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Section "Penetration Firestopping."

3.03 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.04 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electronic safety and security installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Section 078400 " Firestopping."

END OF SECTION 28 0100

SECTION 280500 - COMMON WORK FOR ELECTRONIC SAFETY AND SECURITY SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Communications equipment coordination and installation.
2. Common communications installation requirements.
3. Demolition
4. Waterproofing.
5. Weatherproofing locations.
6. Cutting and Patching.
7. Painting.
8. Equipment Foundations, Supports, Piers and Attachments.
9. Equipment Guards and Rails.
10. Cleaning, Protecting and Adjusting.
11. Welding.
12. Sleeves for raceways and cables.
13. Sleeve seals.
14. Grout.

1.03 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

C. Wiring: Cable and/or wire installed in Raceway.

1.04 SUBMITTALS

A. Product Data: For sleeve seals.

1.05 WATERPROOFING

A. Where work pierces waterproofing, including waterproof concrete, the method of installation shall be approved by the Architect prior to performing the work. Furnish necessary sleeves, caulking and flashing required to make openings absolutely watertight.

1.06 WEATHERPROOFING LOCATIONS (WP)

A. Communication apparatus, such as outlet boxes, switches, connection panels, speakers, cameras, and other devices shall be weatherproof gasketed type, NEMA Types 3 or 4 in the following instances:

1. On surface of exterior face of building, including areas where not under canopies, cast boxes with threaded hubs must be used and under canopies steel boxes with gasket connections to devices.
2. In any areas where specifically noted "WP" or required by the NEC or Regulations mentioned herein.
3. Within air conditioning enclosures.
4. In underground splice boxes.
5. On building roof.
6. Within vivarium locations.
7. In unconditioned spaces subject to exterior ambient conditions such as loading docks and parking garages.

1.07 CUTTING AND PATCHING

A. Provide cutting and patching necessary to install the work specified herein. Patching shall match adjacent surfaces. Refer to Division 1, Cutting and Patching for specific directions.

B. No structural members shall be cut without prior approval of the Architect; such cutting shall be done in a manner directed by him.

C. Provide ceiling removal and replacement where work above ceilings is required. Replace ceiling components damaged in the process.

D. Provide patching where communications devices are removed from walls, ceilings or floors.

1.08 ACCESSIBILITY

A. Coordinate to ensure the sufficiency of the size of shafts, and chases, and the adequacy of clearances in hung ceilings and other areas required for the proper installation of this work.

B. Locate equipment which must be serviced, operated or maintained in fully accessible positions. Locations in ceilings requiring access shall be coordinated with, but not limited to lights, curtain tracks, and speakers. Equipment requiring access shall include, but is not necessarily limited to, motors, junction boxes, fire dampers, controllers, switchgear, etc.

C. Indicate the locations of access doors for each concealed device, concealed behind finished construction and requiring service on the coordination drawings. Equipment below floor slab or finished grade shall also be indicated on the coordination drawings.

D. Furnish access doors under this division for installation by General Contractor. Coordinate during bidding phase with General Contractor. Locations of access doors in finished construction shall be submitted in sufficient time to be installed in the normal course of the work.

1. Manufacturers: Subject to compliance with requirements, furnish access doors by one of the following:

a. Bar-Co., Inc.
b. J. L. Industries
c. Karp Associates, Inc.
d. Nystrom, Inc.

2. Materials and Fabrication:

a. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.
b. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction, unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.
c. Frames: Fabricate from 16-gauge steel.

1) Fabricate frame with exposed flange nominal 1 inch wide around perimeter of frame for units installed in the following construction:

a) Exposed Masonry

2) For gypsum drywall or veneer gypsum plaster, furnish perforated frames with drywall bead.
3) For installation in masonry construction, furnish frames with adjustable metal masonry anchors.
4) For full-bed plaster applications, furnish frames with galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.

d. Flush Panel Doors: Fabricate from not less than 14-gauge sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175°. Finish with manufacturer's factory-applied prime paint.

1) For fire-rated units, provide manufacturer's standard insulated flush panel/doors, with continuous piano hinge and self-closing mechanism.

e. Locking Devices: Furnish flush, screwdriver-operated cam locks of number required to hold door in flush, smooth plane when closed.

1.09 PAINTING

A. Painting requirements of this section shall conform to Division 9.

B. Provide surface preparation, priming, and final coat application in strict accordance with manufacturer's recommendations.

C. Provide prime coat painting for the following:

1. Indoor miscellaneous steel and iron provided under this Division of the specifications.
2. Indoor hangers and supports provided under this Division of the specifications.

1.10 EQUIPMENT FOUNDATIONS, SUPPORTS, PIERS AND ATTACHMENTS

A. Provide necessary foundations, auxiliary steel, supports, pads, bases and piers required for equipment specified in this division; submit drawings in accordance with Shop Drawing Submittal requirements prior to the purchase, fabrication or construction of same.

B. Construction of foundations, supports, and pads where mounted on the floor, shall be of the same materials and same quality of finish as the adjacent and surrounding floor material.

C. Equipment shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the Architect, not strong enough shall be replaced as directed, with no additional cost to the Owner.

1.11 CLEANING, PROTECTING AND ADJUSTING

A. Cleaning

1. General cleaning requirements are specified in Division 1.
2. Upon completion of the work, clean the exterior surface of equipment, accessories, and trim installed. Clean, polish, and leave equipment, accessories, and trim in first-class condition.

B. Protection of Surfaces

1. Protect new and existing surfaces from damage during the construction period.
2. Provide plywood or similar material under equipment or materials stored on floors or roofs. Provide protection in areas where construction may damage surfaces.
3. Surfaces damaged during the construction shall be repaired or replaced at the cost of the Contractor at fault. The method or repairing or replacing the surface shall be approved by the Owner and Architect.

C. Protection of Services

1. Protect new and existing services from damage during the construction period.
2. Repair, replace, and maintain in service any new or existing utilities, facilities, or services (underground, overground, interior, or exterior) damaged, broken, or otherwise rendered inoperative during the course of construction.
3. Services damaged during the construction shall be replaced at the cost of the Contractor at fault. The method used in repairing, replacing, or maintain the services shall be approved by the Owner and Architect.

D. Protection of Equipment and Materials

1. Equipment and materials shall be stored in a manner that shall maintain an orderly, clean appearance. If stored on-site in open or unprotected areas, equipment and material shall be kept off the ground by means of pallets or racks, and covered with tarpaulins.
2. Equipment and material, if left unprotected and damaged, shall be repainted or otherwise refurbished at the discretion of the Owner. Equipment and material is subject to rejection and replacement if, in the opinion of the Architect or the manufacturer's engineering department, the equipment has deteriorated or been damaged to the extent that its immediate use or performance is questionable, or that its normal life expectancy has been curtailed.

3. During the construction period, protect equipment from damage and dirt.

E. Adjusting

1. After the entire installation has been completed, make required adjustments to all systems until performance requirements are met.

1.12 SPECIAL TOOLS

A. Provide the College Project Manager with two (2) sets of special tools required for operation and maintenance of equipment provided.

1.13 WELDING

A. General Requirements

1. This paragraph covers the welding of systems. Deviations from applicable codes, approved procedures and approved shop drawings shall not be permitted. Materials or components with welds made off the site shall not be accepted if the welding does not conform to the requirements of this specification. Develop and qualify procedures for welding metals included in the work. Certification testing shall be performed by an approved independent testing laboratory. Bear costs of such testing.
2. Certified welders, previously certified by test, may be accepted for the work without re-certification provided that all of the following conditions are fulfilled:

    a. Submit copies of welder certification test records in accordance with this Division and Division 1 requirements.
    b. Testing was performed by an independent testing laboratory.
    c. The welding procedures and welders are certified in accordance with the "ASME Boiler and Pressure Vessel Code," and base materials, filler materials, electrodes, equipment, and processes conform to the applicable requirements of this specification.
    d. Certification has been within a one (1) year period from the start of the project.

3. Filler metals, electrodes, fluxes and other welding materials shall be delivered to the site in manufacturers' original packages and stored in a dry space until used. Packages shall be properly labeled and designed to give maximum protection from moisture and to assure safe handling.
4. Submit welding certificates for review. Each welder assigned to work covered by this specification shall be certified by performance tests using equipment, positions, procedures, base metals, and electrodes or bare filler wires.
5. Before assigning welders to the work, provide the architect with their names, together with certification that each individual is certified as specified. No welding work shall start prior to submissions. The certification shall state the type of welding and positions for which each is certified, the code and procedure under which each is certified, date certified, and the firm and individual certifying the certified tests.
6. Each welder shall be assigned an identifying number, letter, or symbol that shall be used to identify his welds. A list of the welders' names and symbol for each shall be submitted. To identify welds, either written records indicating the location of welds made by each welder shall be submitted, or each welder shall apply his mark adjacent to his weld using an approved rubber stamp or felt-tipped marker with permanent, weatherproof ink or other approved methods that do not deform the metal. For seam welds, identification

marks shall be placed adjacent to the welds at 3 foot intervals. Identification by die stamps or electric etchers shall be confined to the weld reinforcing crown, preferably in the finished crater.

7. Provide smoke control and fire watch.

PART 2 - PRODUCTS

2.01 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel.

1. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.02 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Metraflex Co.
d. Pipeline Seal and Insulator, Inc.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
3. Pressure Plates: Stainless steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.03 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.01 COMMON REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY SYSTEMS INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Coordinate piping systems installed at a required slope.

F. Apply for detailed and specific information regarding the location of equipment as the final location may differ from that indicated on the drawings. Outlets, equipment or wiring improperly placed because of failure to obtain this information shall be relocated and re-installed without additional expense to the Owner. Determine the actual direction of door swings, so that local switches and other controls shall be installed at the lockside of doors, unless otherwise noted. Improperly located switches shall be relocated without additional expense to the Owner.

G. The design shall be subject to such revisions as may be necessary to overcome building obstructions. No changes shall be made in location of outlets or equipment without written consent of the Architect and Owner.

H. Unless otherwise mentioned or indicated, mounting heights of outlets are shown on the drawings or in the specification. Dimensions given shall be considered to be from center of outlet to finished floor.

I. Coordinate the location and elevation of all communications devices and fixtures with the architectural interior elevation plan and reflective ceiling plan prior to installation.

J. Properly rough in for the communications raceways and equipment under this contract and modify as required for coordination during the construction period.

K. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

L. Coordinate location of access panels and doors for communications items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section “Access Doors and Frames.”

M. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section 078400 “Firestopping.”

3.02 WELDING

A. Perform welding in accordance with qualified procedures using certified welders. Welding shall not be done when the quality of the completed weld could be impaired by the prevailing working or weather conditions. Welding of hangers, supports, and plates to structural members shall conform to AWS specifications.

B. Field bevels and shop bevels shall be by mechanical means or by flame cutting. Where beveling is by flame cutting, thoroughly clean surfaces of scale and oxidation just prior to welding. Beveling shall conform to ANSI B31.1 and AWS B3.0.

C. Replace and reinspect defective welds. Repairing defective welds by adding weld material over the defect or by peening shall not be permitted. Welders responsible for defective welds must be re-certified.

D. Store electrodes in a dry heated area, keep free of moisture and dampness during fabrication operations. Discard electrodes that have lost part of their coating.

E. Provide smoke control and fire watch.

3.03 SLEEVE INSTALLATION FOR ELECTRONIC SAFETY AND SECURITY SYSTEMS PENETRATIONS

A. Electronic Safety and Security Systems penetrations occur when raceways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, fire-rated floor, or wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

F. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.

G. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

H. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."

I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable

penetration sleeves with firestop materials. Comply with requirements in Division 07 Section " Firestopping."

J. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

K. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

L. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.04 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.05 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for communications installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 firestopping section.

3.06 DUST, DIRT AND NOISE

A. Carry out new work and make changes, relocations, and installations with a minimum of noise. Site areas and new equipment, floors and walls, shall be adequately protected from dust and dirt caused by the work. Protection shall include suitable temporary barriers or coverings. The exterior and interior premises of each building shall be kept clean as possible during construction. Damages to surfaces or equipment as a result of negligence shall be replaced or corrected as required.

B. School activities may be under way during much of the construction period. It is imperative that school functions and activities are given priority and the highest level of respect. Contractor functions which may be excessively noisy or disruptive shall be scheduled for times when school functions will not be interrupted or disturbed.

3.7 ENVIRONMENTAL AIR PLENUMS

A. In spaces over hung ceiling which are used for environmental air handling purposes as defined by Article 300.22C of the National Electric Code, power data and communications cable must be in conduit or of the type cable rated for air plenum use. Cable type and/or raceway is generally indicated on the drawings and specifications although the Contractor shall be responsible to clearly define ceiling space used for environmental air purposes.

3.8 SPECIAL ENGINEERING SERVICES

A. In the instance of complex or specialized telecommunications, security, and audiovisual systems that are included in Division 27; the installation, final connections, and testing of such systems shall be made under the direct supervision of competent authorized service engineers who shall be in the employ of the respective equipment manufacturer. Provide the Owner with copies of instruction manuals and booklets for each system and piece of equipment installed. Provide any additional instruction to the Owner over and above the listed above in the care, adjustment, and operation of all parts of the communications systems.

END OF SECTION 280500

SECTION 280528 - CONDUIT AND BACKBOXES FOR ELECTRONIC SAFETY AND SECURITY SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide all materials and labor for the installation of a pathway system for inside plant communications circuits. This section includes requirements for horizontal and building backbone raceways, fittings, and boxes specific to communications circuits (cabling) for voice and data.

B. Related Sections:

1. Division 26 Section — "Grounding"
2. Division 26 Section - "Raceways"
3. Division 26 Section – "Boxes and Fittings"

1.3 REFERENCES

A. Incorporate by reference the applicable portions of the following specifications, standards, codes into this specification section.

1. General:
    a. National Electrical Code (NEC)
    b. National Electrical Safety Code (NESC)
    c. Occupational Safety and Health Act (OSHA)
2. Communications:
    a. ANSI/TIA/EIA - 568: *Commercial Building Telecommunications Cabling Standard*
    b. ANSI/TIA/EIA - 569: *Commercial Building Standard for Telecommunication Pathways and Spaces*
    c. ANSI/TIA/EIA - 606: *The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings*
    d. ANSI/TIA/EIA - 607: *Commercial Building Grounding and Bonding Requirements for Telecommunications*
    e. ISO/IEC IS 11801: *Generic Cabling for Customer Premises*
    f. BICSI: *BICSI Telecommunications Cabling Installation Manual*
    g. BICSI: *BICSI Telecommunications Distribution Methods Manual (TDMM)*

1.4 DEFINITIONS

A. “IMC” shall mean Intermediate Metal Conduit.

B. “RMC” shall mean Rigid Metal Conduit.

C. “SMR” shall mean Surface Metal Raceway.

D. “Raceway” shall mean any enclosed channel for routing wire, cable or busbars.

E. “TMGB” shall mean *Telecommunications Main Grounding Busbar.* There is typically one TMGB per building, located in the main telecommunications room. This busbar is directly bonded to the electrical service ground.

F. “TGB” shall mean *Telecommunications Grounding Busbar.* There is typically one TGB per telecommunications room. The TGB is connected both to the TMGB and to building structural steel or other permanent metallic systems.

G. “TBB” shall mean *Telecommunications Bonding Backbone.* The TBB is a conductor used to connect TMGBs to the TGBs.

H. “Pullbox” shall mean a metallic box with a removable cover, used to facilitate pulling cable through conduit runs longer than 100’ or in which there are more than 180 degrees of bends.

I. “Junction box” shall mean a pullbox wherein a feeder conduit transitions to multiple distribution conduits.

1.5 SYSTEM DESCRIPTION

A. Furnish, install, and place into satisfactory and successful operation all materials, devices, and necessary appurtenances to provide a complete Raceway system as hereinafter specified and/or shown on the Contract Documents. The Raceway system shall support an ANSI/TIA/EIA and ISO/IEC compliant communications Structured Cabling System (SCS) as specified in 271500 – Voice Data Video Cabling

B. The work shall include materials, equipment and apparatus not specifically mentioned herein or noted on the Contract Documents but which are necessary to make a complete working Raceway system.

1.6 SUBMITTALS

A. Product Data Submittals: Provide submittal information for review before materials are delivered to the job site. Provide product data submittals for all products at the same time.

1. Submit a letter stating that the materials will be provided as specified, and specifically listing any items that will not be provided as specified. The letter shall also state that the Contractor has reviewed the specified items and agrees that they are applicable to this project in all respects.

2. For those items noted as allowing “or equal,” and which are not being provided as specifically named, submit standard manufacturer's cut sheets or other descriptive information, along with a written description detailing the reason for the substitution.

3. Provide standard manufacturer’s cut sheets and the operating and maintenance (O&M) instructions at the time of submittal review for each device in the system, regardless of whether it is submitted as specified or as an approved equal. These instructions shall

detail how to install and service the equipment and shall include information necessary for rough-in and preparation of the building facilities to receive the materials.

B. Closeout Submittals: Provide submittal information for review as follows:

1. O&M Manual for Communications - At the completion of the project, submit all O&M information from product data submittals (above), updated to reflect any changes during the course of construction, to the College in the telecommunications-specific O&M Manual for Communications binder labeled with the project name and description.

2. Records - Maintain at the job site a minimum of one set of Record Drawings, Specification, and Addenda. Record Drawings shall consist of redline markups of drawings, specifications and spreadsheets, including maintenance hole/handhole butterfly drawings.

a. Document changes to the system from that originally shown on the Contract Documents and clearly identify system component labels and identifiers on Record Drawings.

b. Keep Record Drawings at the job site and make available to the Owner and Designer at any time.

c. Keep Record Drawings current throughout the course of construction. (“Current” is defined as not more than one week behind actual construction).

d. Show identifiers for major infrastructure components on Record Drawings.

1.7 CONTRACTOR WARRANTY:

A. Provide a Contractor-endorsed two-year service warranty against defects in materials and workmanship.

1. Provide labor attributable to the fulfillment of this warranty at no cost to the Owner.

2. The Contractor Warranty period shall commence upon Owner acceptance of the work.

1.8 QUALITY ASSURANCE

A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NEC, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

B. Comply with NECA's "Standard of Installation."

C. Comply with NEC.

1.9 COORDINATION

A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials shall consist of conduit, surface metal raceway, outlet boxes, fittings, enclosures, pull boxes, and other raceway incidentals and accessories as required for inside plant communications circuits.

2.2 MATERIALS

A. Conduit:

1. IMC. 1” minimum conduit size.

a. Conduit: Hot dipped galvanized steel with threaded ends meeting ANSI C80.1.

b. Couplings: Unsplit, NPT threaded steel cylinders with galvanizing equal to the conduit.

c. Nipples: Same as conduit, factory-made up to 8 inches in diameter, no running threads.

B. Surface Raceway: IMC surface raceway.

C. Outlet boxes: Minimum 4”x4” size, 2 1/8” minimum depth, with extension rings (if needed) and single gang covers (i.e.; mud rings), unless otherwise noted on the Contract Documents. Combined interior depth of outlet box, extension ring and cover shall be a minimum 2-1/2”. Stamped steel, deep drawn one piece (without welds or tab connections), galvanized, with knockouts for 1” trade size conduit or connector entrance, meeting NEMA OS 1.

1. Acceptable manufacturers:

a. Appleton, Raco, Steel City, or equal

2. Wiremold Extra Deep Switch and Receptacle Box: V5744-2 (two gang), or equal

D. Junction Boxes and Pull Boxes: Stamped steel, deep drawn one piece (without welds or tab connections), galvanized, with knockouts for conduit or connector entrance. Boxes 6”x6”x4” or larger may be code gauge fabricated steel continuously welded at seams and painted after fabrication.

1. Dry locations: meeting NEMA OS 1.

2. Wet locations: NEMA OS 3R.

E. Miscellaneous Fittings:

1. Locknuts and conduit bushings: Malleable iron

a. Appleton, Crouse Hinds, OZ Gedney, or equal

2. Through wall seals and floor seals shall be:

a. OZ Gedney FS and WS series, or equal.

F. Pull Strings: Plastic or nylon with a minimum test rating of 200 lb.

2.3 FIRESTOPPING

A. Material: Conform to both Flame (F) and Temperature (T) ratings as required by local building codes and as tested by nationally accepted test agencies per ASTM E814 or UL 1479 fire test in a configuration that is representative of the actual field conditions.

2.4 LABELING AND ADMINISTRATION

A. Labels: As recommended in ANSI/TIA/EIA 606. Permanent (i.e. not subject to fading or erasure), permanently affixed, typed, and created by a hand-carried label maker or an approved equivalent software-based label making system. Handwritten labels are not acceptable.

1. Hand-carried label maker:

a. Brady: ID Pro Plus (or approved equal).

2. Labels:

a. Brady: Bradymaker Wire Marking Labels WML-511-292 (or approved equal).

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor is solely responsible for the safety of the public and workers in accordance with all applicable rules, regulations, building codes and ordinances.

B. All work shall comply with applicable safety rules and regulations including OSHA. All work shall comply with the requirements of the National Electrical Safety Code (NESC) and the NEC except where local codes and/or regulations are more stringent, in which case the local codes and/or regulations shall govern.

C. All work shall comply with the standards, references and codes listed in PART 1 -- REFERENCES above. Where questions arise regarding which standards, references, or codes apply, the more stringent shall prevail.

D. All work shall comply with the requirements and recommendations of the product manufacturers. Where questions arise regarding which requirements and recommendations apply, the more stringent shall prevail.

E. Install the raceway system in a manner ensuring that communications circuits, when installed, are able to fully comply with the ANSI/TIA/EIA and other references listed in Part 1 — References, above.

F. Replace and/or repair to original (or better) condition any existing structures, materials, equipment, etc. inadvertently demolished or damaged by the Contractor during the course of construction at no additional cost to the Owner.

G. Remove surplus material and debris from the job site and dispose of legally.

3.2 EXAMINATION

A. Examine surfaces and spaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of raceway

installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions. Provide a raceway for each location indicated. Do not gang raceway into wireways, pullboxes, junction boxes, etc., without specific approval from the Engineer /Consultant.

B. Conduit:

1. Install EMT unless other conduit is shown on the Contract Documents or is required by Code.

2. Install conduit as a complete, continuous system without wires, mechanically secured and electrically connected to metal boxes, fittings and equipment. Blank-off unused openings using factory-made knockout seals.

3. Run conduit in the most direct route possible, parallel to building lines. Do not route conduit through areas in which flammable material may be stored.

4. Keep conduit at least 6 inches away from parallel runs of flues and steam or hot-water pipes or other heat sources operating at temperatures above one-hundred degrees Fahrenheit. Install horizontal conduit runs above water piping.

5. Keep conduit away from sources of electromagnetic interference as follows:

a. 5 inches from fluorescent lighting

b. 12 inches from conduit and cables used for electrical power distribution

c. 48 inches from motors or transformers

6. Do not exceed 90 meters total length for a given conduit run to be used for distribution cabling (from outlet box to telecommunications room), including intermediate conduits and junction boxes, unless otherwise noted.

7. Install conduit exposed, except in finished areas or unless shown otherwise on the drawings. Do not install conduit below grade/slab unless specifically shown on the Contract Documents as being installed below grade/slab.

8. Install exposed conduit in lines parallel or perpendicular to building lines or structural members except where the structure is not level. Follow the surface contours as much as practical. Do not install crossovers or offsets that can be avoided by installing the conduit in a different sequence or a uniform line.

a. Run parallel or banked conduits together, on common supports where practical.

b. Make bends in parallel or banked runs from same centerline to make bends parallel.

9. Conduits concealed above ceilings, furred spaces, etc., which are normally inaccessible may be run at angles not parallel to the building lines.

10. Wherever practical, route conduit with adjacent ductwork or piping and support on common racks. Base required strength of racks, hangers, and anchors on combined weights of conduit and piping.

11. Where conduits cross building expansion joints, use suitable sliding or offsetting expansion fittings. Unless specifically approved for bonding, use a suitable bonding jumper.

12. Support conduits as specified in Section "Basic Electrical Materials and Methods."

    a. Provide anchors, hangers, supports, clamps, etc. to support the conduits from the structures in or on which they are installed. Do not space supports farther apart than five feet.

    b. Provide sufficient clearance to allow conduit to be added to racks, hangers, etc. in the future.

    c. Support conduit within three feet of each outlet box, junction box, gutter, panel, fitting, etc.

13. Ream conduits to eliminate sharp edges and terminate with metallic insulated grounded throat bushings. Seal each conduit after installation (until cable is installed) with a removable mechanical-type seal to keep conduits clean, dry and prevent foreign matter from entering conduits.

14. Install a pull string in each conduit.

15. For conduits entering through the floor of a telecommunications room, terminate conduits 6” above the finished floor.

16. Do not install communications conduits in wet, hazardous or corrosive locations.

17. Where conduit is shown embedded in masonry, embed conduit in the hollow core of the masonry. Horizontal runs in the joint between masonry units are not permitted.

18. Where conduit is shown embedded in concrete, embed conduit a minimum of two inches from the exterior of the concrete. Do not place conduit in concrete less than 4 inches thick.

    a. One inch trade size conduit shall be used. Conduits sized smaller than one inch trade size conduit are not permitted embedded in concrete without approval from the College.

    b. Run conduit parallel to main reinforcement.

    c. Conduit crossovers in concrete are not permitted.

19. Where conduit exits from grade or concrete, provide a rigid steel elbow and adapter.

20. Where conduit enters a space through the floor and terminates in that space, terminate the conduit at 6” above the finished floor.

21. Where conduits terminate at a cable tray, the conduits shall be consistently terminated no more than 8” from the cable tray, and have a visually uniform appearance.

22. Where several circuits follow a common route, stagger pullboxes or fittings.

23. Where several circuits are shown grouped in one box, individually fireproof each conduit.

24. Bend and offset metal conduit with standard factory sweeps or conduit fittings. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

    a. Conduit sweeps:

        1) Sweeps shall not exceed 90 degrees.

        2) Do not exceed 180 degrees for the sum total of conduit sweeps for a section of conduit (between conduit termination points).

        3) Sweep radius shall be at least 10 times the internal diameter of the conduit.

        4) 90-degree condulets (LB's) and electrical elbows are not acceptable.

    b. Factory-manufactured sweeps are required for bends in conduit larger than 1-¼" trade size.

    c. For bends in 1 ¼" trade size conduit and larger, field-manufactured bends (using a hydraulic bender with a 1 ¼" boot) are permitted only when factory-manufactured sweeps are not suitable for the conditions. In all other cases, factory-manufactured sweeps are required. "Hickey-bender" use is prohibited.

25. Connect conduit to hubless enclosures, cabinets and boxes with double locknuts and with insulating type bushings. Use grounding type bushings where connecting to concentric or eccentric knockouts. Make conduit connections to enclosures at the nearest practicable point of entry to the enclosure area where the devices are located to which the circuits contained in the conduit will connect.

26. Penetrations for raceways:

    a. Do not bore holes in floor and ceiling joists outside center third of member depth or within two feet of bearing points. Holes shall be 1-¼" diameter maximum.

    b. Penetrate finished walls and finished surfaces with a PVC or sheet metal sleeve with an interior diameter (ID) at least 1/4" greater than the outer diameter (OD) of the conduit, set flush with walls, pack with fiberglass, seal with silicone sealant.

    c. Penetrate poured-in-place walls and free slabs with a cast iron sleeve (or Schedule 40 PVC black pipe sleeve for above-grade only) with retaining ring or washer. Set sleeves flush with forms or edges of slab. Pack around conduit with fiberglass and seal with silicone sealant.

27. Raceway terminations and connections:

    a. Join conduits with fittings designed and approved for the purpose and make joints tight. Do not use set indent-type or screw-type couplings.

    b. Make threaded connections waterproof and rustproof by applying a watertight, conductive thread compound. Clean threads of cutting oil before applying thread compound.

    c. Make conduit terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.

d. Cut ends of conduit square using a hand saw, power saw or pipe cutter. Ream cut ends to remove burrs and sharp ends. Where conduit threads are cut in the field, cut threads to have same effective length, same thread dimensions and same taper as specified for factory-cut threads.

e. Provide double locknuts and insulating bushings at conduit connections to boxes and cabinets. Align raceways to enter squarely and install locknuts with dished part against the box. Use grounding type bushings where connecting to concentric or eccentric knockouts.

f. Where conduits are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.

28. Install conduit sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed conduits, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

a. Where conduits pass from warm to cold locations, such as the boundaries of air conditioned or refrigerated spaces and where conduits enter or exit buildings from outdoor areas, including underground ducts or conduit runs.

b. Where otherwise required by the NEC.

29. Conduit shall be clean and dry.

C. Sleeves:

1. Provide sleeves where required, sized as noted on the Contract Documents. Where not noted, sleeve sizing shall be determined by the type and quantity of cable to be routed through the sleeve per TIA/EIA 569A cable capacity standards, plus an additional 20% for future expansion.

2. Provide roto-hammering or core drilling where required for installation.

3. Seal between sleeve and wall or floor in which the sleeve is installed. Firestop all penetrations to restore wall or floor to pre-penetration fire-rating.

D. Surface IMC Raceway:

1. Provide IMC surface raceway for all surface mounted telecommunications outlet boxes and as shown on the Contract Documents.

2. Surface raceway shall be routed parallel to and perpendicular to surfaces or exposed structural members, and follow surface contours.

3. Surface raceway color shall match as closely as possible the existing wall finish. Do not paint Surface Raceway.

4. Surface raceway systems shall be completely installed, including insulating bushings and inserts as required by manufacturer’s installation requirements. Unused openings in the surface raceway shall be closed using manufactured fittings.

5. Surface raceway shall have a minimum two inch radius control at all bend points.

6. Surface raceway shall be securely supported by screws or other anchor-type devices at intervals not exceeding 10 feet and with no less than two supports per straight raceway section. Surface raceway shall be securely supported in accordance with the manufacturer's requirements. Tape and glue are not acceptable support methods.

7. Mechanically and electrically continuous surface raceway shall be bonded and grounded to the Telecommunications Grounding system.

E. Outlet Boxes:

1. Provide outlet boxes and covers as shown on the Contract Documents and as needed. Verify that the appropriate cover type and depth is provided for each type of wall and finish. Provide extension rings as needed.

2. Coordinate box locations with building surfaces and finishes to avoid bridging wainscots, joints, finish changes, etc.

3. Install boxes in dry locations (not wet, corrosive, or hazardous).

4. Attach boxes securely to building structure with a minimum of two fasteners. Provide attachments to withstand a force of one hundred pounds minimum, applied vertically or horizontally.

5. Install boxes at the following heights to the bottom of the box, except where noted otherwise:

   a. Wall mounted telephones: 48" above finished floor.

   b. Workstation outlets: 18" above finished floor.

   c. Place boxes for outlets on cabinets, countertops, shelves, and similar boxes located above countertops two inches above the finished surface or two inches above the back splash. Coordinate and verify size, style, and location with the supplier or installer of these items prior to outlet box installation.

6. Recessed mounted outlet boxes:

   a. Recess boxes in the wall, floor, and ceiling surfaces in finished areas. Set boxes plumb, level, square and flush with finished building surfaces within one-sixteenth inch for each condition. Set boxes so that box openings in building surfaces are within one-eighth inch of edge of material cut-out and fill tight to box with building materials. Single gang opening shall extend at least to the finished wall surface and extend not more than 1/8 inch beyond the finished wall surface. Provide backing for boxes using structural material to prevent rotation on studs or joists.

   b. Install floor boxes level and adjust to finished floor surface.

7. Surface-mounted outlet boxes:

   a. For boxes surface-mounted on finished walls, provide Wiremold outlet box or equivalent. Cut box as necessary to accept conduit.

   b. For boxes surface-mounted on unfinished walls (i.e. electrical rooms, mechanical rooms), provide 4"x4" (minimum) outlet box with single gang cover.

F. Junction Boxes:

1. Provide junction boxes as shown on the Contract Documents and as required.

a. Where sizing is not shown on the Contract Documents, size junction box length and depth according to the size of the feeder conduit in the following table:

Feeder Conduit Size	Box Length	Box Depth
1”	12”	4”
1-¼”	12”	4”
1-½”	12”	4”
2”	24”	4”
2-½”	24”	6”
3	36”	6”
3-½”	48”	6”
4”	60”	6”

b. Where sizing is not shown on the Contract Documents, size junction box width according to the following formula:

1) From the table below, select the width associated with the largest conduit on the distribution side of the box. For each additional distribution conduit, add the “Increase Width” value associated with the size of that distribution conduit to the box width for the largest distribution conduit.

a) For example, if the distribution side of the junction box has one 1-¼” distribution conduit and three 1” distribution conduits, the total distribution-side width would be 6”+2”+2”+2”=12”.

2) Repeat the above process for the feeder side of the junction box. Junction boxes are typically fed by a single conduit, therefore unless the box has more than one feeder conduit, the “Increase Width” part of the formula is unnecessary.

a) For example, if the feeder side of the junction box has two 2” feeder conduits the total feeder-side width would be 8”+5”=13”.

3) The larger of the two width calculations (distribution side vs. feeder side) shall be the width of the junction box to be provided.

a) For example, if the distribution-side width were 10” and the feeder-side width were 13”, provide a 13” wide junction box.

Conduit Size	Box Width	For each additional conduit Increase Width
1”	4”	2”
1-¼”	6”	3”
1-½”	8”	4”
2”	8”	5”
2-½”	10”	6”
3	12”	6”
3-½”	12”	6”
4”	15”	8”

2. A junction box may not be substituted for a 90-degree bend. *90 degree condulets (LB’s) are not acceptable.*

3. Install junction boxes in a location readily accessible both at time of construction and after building occupation. Do not install junction boxes in inaccessible interstitial building spaces.

4. Where junction boxes are to be mounted on ceiling structure above ceiling grid, do not mount higher than 4’ above grid.

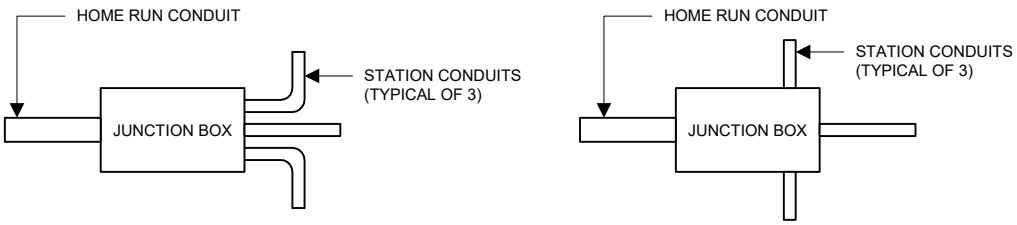
5. Install hinged-cover enclosures and cabinets plumb, and supported at each corner.

6. Install junction boxes so that the access door opens from the side where the cable installer will normally work – typically from the bottom (floor side) of the box.

   a. Where a junction box is installed in a ceiling space, coordinate with other trades to provide full access to the junction box door and adequate working room for both the installation personnel and for proper looping of cable during installation.

   b. Provide a lockable access cover (or junction box door if junction box is exposed) in hard lid ceilings.

7. Install junction boxes such that conduits enter and exit at opposite ends of the box as follows:



CORRECT INSTALLATION INCORRECT INSTALLATION

G. Pull Boxes:

1. Provide pull boxes as shown on the Contract Documents and as required.

   a. Where sizing is not shown on the Contract Documents, size pull boxes as follows:

Size of Largest Conduit	Box Width	Box Length	Box Depth
1”	4”	12”	4”
1-¼”	6”	12”	4”
1-½”	8”	12”	4”
2”	8”	24”	4”
2-½”	10”	24”	6”
3	12”	36”	6”
3-½”	12”	48”	6”
4”	15”	60”	6”

   b. Where a pull box is required with conduits 1” trade size or smaller, an outlet box may be used as a pull box. Where outlet boxes are used as pull boxes, the outlet boxes shall be dedicated for use as a pull box and shall not host cable termination hardware.

2. A pull box may not be substituted for a 90-degree bend. *90 degree condulets (LB’s) are not acceptable.*

3. Install pull boxes in an accessible location, readily accessible both at time of construction and after building occupation. Do not install pull boxes in inaccessible interstitial building space.

4. Where pull boxes are to be mounted on ceiling structure above ceiling grid, do not mount higher than 4’ above grid (mount on wall instead).

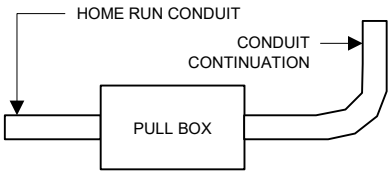
5. Install hinged-cover enclosures and cabinets plumb, and supported at each corner.

6. Install pull boxes so that the access door opens from the side where the cable installer will normally work (typically from the bottom, or floor side, of the box).

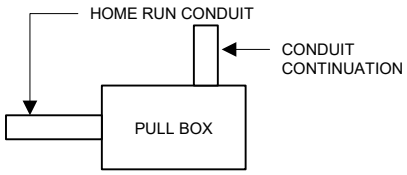
   a. Where a pull box is installed in a ceiling space, provide full access to the junction box door and adequate working room for both the installation personnel and for proper looping of cable during installation.

   b. Provide a lockable access cover (or pull box door if pull box is exposed) in hard lid ceilings.

7. Install pull boxes such that conduits enter and exit at opposite ends of the box as follows:



CORRECT INSTALLATION



INCORRECT INSTALLATION

H. Firestopping:

1. Only employees trained/certified by the firestopping manufacturer shall apply firestopping materials.

2. Maintain fire rating of penetrated fire-rated walls. Firestop and seal each penetration made during construction.

   a. Provide firestopping material for through and membrane penetrations of fire-rated barriers.

   b. Installation shall be performed in strict accordance with manufacturer's detailed installation procedures.

   c. Install firestops in accordance with fire test reports, fire resistance requirements, acceptable sample installations, manufacturer's recommendations, local fire and building authorities, and applicable codes and standards referenced in PART 1 – REFERENCES. Apply all sealing material in a manner acceptable to the local fire and building authorities.

I. Grounding/Bonding: Grounding and bonding work shall comply with the Virginia Uniform Statewide Building Code, Uniform Fire Code, National Electrical Code, and UL 467, ANSI/TIA/EIA standards and the references listed in PART 1 – REFERENCES above, as well as local codes which may specify additional grounding and/or bonding requirements.

1. Bond metallic raceway together and to the nearest TGB. Ensure that bonding breaks through paint to bare metallic surface of painted metallic hardware.

3.4 LABELS:

A. Conduits: For any conduit extending beyond the space or room in which it starts, label each such conduit end in a clear manner by designating the location of the other end of the conduit (i.e.; room name, telecommunications room name, pull box identifier, outlet identifier (use the label of the first port of the outlet as the outlet identifier), etc.). Indicate conduit length on the label.

1. Where a conduit is intended for future cabling use outside of the Contract, the conduit shall be labeled in a clear manner by designating the location of the other end of the conduit (i.e. room name, telecommunications room name, pull box identifier, etc.) along with a sequential number for each spare conduit terminated into a single room. Indicate conduit length on the label.

   a. Suggestion: The second spare conduit (whether spare or in use) between Room 100 and telecommunications room 1A might be labeled in the telecommunications room as "Room 100 - #2, __ feet." In Room 100 the same conduit might be labeled "1A - #2, __ feet."

B. Pull Boxes: Label each pullbox with a unique identifier. Identifiers shall be of the form “RN-Y” where “RN” is the room name of the room closest to (or containing) the pull box, and “Y” is the sequential number of the pull box for each “RN”.

1. Example: The second pull box in the vicinity of room “100” would have the label “100-2”.

C. Pull Strings: For any conduit extending beyond the space or room in which it starts, label its pull string in a clear manner by designating the location of the other end of the pull string (i.e. room name, telecommunications room name, pull box identifier, outlet identifier (use the label of the first port of the outlet as the outlet identifier), etc.).

1. Where a pull string is installed in a conduit intended for future cabling use outside of the Contract, the pull string shall be labeled similar to the spare conduit in which it is installed.

3.5 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and in accordance with accepted industry practice, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.6 CLEANING

1. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION 280528

SECTION 280544 - SLEEVES AND SLEEVE SEALS FOR ELECTRONIC SAFETY AND SECURITY PATHWAYS AND CABLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Sleeves for pathway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Section 078400 "Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.
2. Penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.01 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:

1. Material: Galvanized-steel sheet.
2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.02 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Advance Products & Systems, Inc.
b. CALPICO, Inc.
c. Metraflex Company (The).
d. Pipeline Seal and Insulator, Inc.
e. Proco Products, Inc.

2. Sealing Elements: Nitrile (Buna N) rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Stainless steel.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.03 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Presealed Systems.

2.04 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.05 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
2. Sealant shall have VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Silicone Foams: Multicomponent, silicone-based, liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.01 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint.
b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pathway or cable unless sleeve seal is to be installed.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between pathway or cable and sleeve for installing sleeve-seal system.

3.02 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at pathway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.03 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 280544

SECTION 281000 - ACCESS CONTROL

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. This section includes the minimum requirements for equipment and installation of Access Control System hardware at the East Garage at Takoma Park Campus at Montgomery College.

B. Contractor shall provide all readers, reader interfaces, access control panels, and all other hardware and software necessary to provide a full, complete and functioning system.

C. All equipment, software, licenses, etc. shall be compatible with the existing Lenel On-Guard access control system.

D. Contractor shall provide all licenses required by any manufacturer in order to provide a fully functioning system.

E. Contractor shall fully configure the existing system so that it incorporates all of the items included in the construction of the new facility. Contractor shall coordinate with the Owner prior to this configuration to determine naming conventions, access rights, time schedules, and any other parameters available on the system.

1.2 QUALITY ASSURANCE

A. All equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the Specification shall be subject to the control and approval of the Owner's Representative. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based on the acceptable manufacturers listed.

B. Materials and work specified herein shall comply with the applicable requirements of:
1. Underwriters Laboratory or equivalent
2. Federal Communications Commission
3. National Electric Code (NEC)

1.3 WARRANTY

A. All materials and workmanship shall be warranted to be free from defects for a period of two (2) years following acceptance by the owner.

B. If within two (2) years after the date of substantial completion, any of the work or equipment is found to be defective or not in compliance with the Contract Documents, the Contractor shall correct it promptly including all parts and labor.

C. The Owner shall give notice to the Contractor of any defects promptly after the discovery of any defective condition.

D. These obligations shall survive termination of the construction contract.

1.4 SUBMITTALS

A. Submit manufacturers' data sheets for proposed systems, and equipment.

B. Submit manufacturers' instructions for storage, handling, protection, examination, preparation, operation, and installation of all products. Include any application conditions or limitations of use stipulated by any product testing agency.

C. Submit all applicable Material Safety Data Sheets.

D. Submit a detailed bill-of-materials listing all manufacturers, part numbers, and quantities that the Bidder proposes to use in this project.

E. Submit detailed shop drawings which include the following information (without limitation):

1. Location of all access control devices.
2. Cable types connecting all devices.
3. Mounting details of all devices.
4. The layout of all equipment fields and/or equipment racks.
5. Schematic drawings showing the interconnection of all devices.

F. Record documents as described in Part 3.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Materials and Equipment: Units of the same type of equipment shall be products of a single manufacturer. All material and equipment shall be new and currently in production. Each major component of equipment shall have the manufacturer's model and serial number in a conspicuous place. Equipment shall conform to UL 294 and UL 1076.

B. Enclosures: System enclosures shall be metallic.
1. Interior Terminal Device: All terminal devices to be used in an interior environment shall be housed in an enclosure that provides protection against dust, falling dirt, and dripping non-corrosive liquids.
2. Exterior Terminal Device: All terminal devices to be used in an exterior environment shall be housed in an enclosure that provides protection against conditions as specified under UL 294 performance requirements for outdoor use equipment, and shall be undamaged by the formation of ice on the enclosure.
3. Interior Electronics: All system electronics to be used in an interior environment shall be housed in enclosures meeting the requirements of NEMA 250 Type 12.
4. Exterior Electronics: All system electronics to be used in an exterior environment shall be housed in enclosures meeting the requirements of NEMA 250 Type 4. Enclosures exposed to direct sunlight shall be finished with white polyester powder coating; and shall be equipped with a sunshield finished to match the enclosure. Sunshield shall be mounted to protect the top of the enclosure from direct sun and shall extend at least 1-inch beyond the edges of the enclosure on all sides.
5. Hazardous Environment Equipment: All system electronics to be used in a hazardous environment shall be housed in enclosures which meets the requirements of paragraph "Hazardous Environment."

C. Tamper Provisions: Enclosures, cabinets, housings, boxes, and fittings of every description having hinged doors or removable covers, and which contain circuits or connections of the ACS equipment or power supplies, shall be provided with cover operated, corrosion resistant tamper switches, arranged to initiate an alarm signal when the door or cover is moved. Tamper switches shall be mechanically mounted to maximize the defeat time when enclosure covers are opened or removed

D. Locks and Key-Lock-Operated Switches: All locks required to be installed on system enclosures for maintenance purposes shall be UL listed, round-key type, with three dual, one mushroom, and three plain pin tumblers or conventional key type lock having a combination of five cylinder pin and five-point three position side bar. The locks shall be so arranged that the key can only be withdrawn when in the locked position. All maintenance locks shall be keyed alike and only two keys shall be furnished for all of these locks.

E. System Component Design: ACS components shall be designed for continuous operation. All electronic components shall be solid state type, mounted on printed circuit boards conforming to UL 796. Circuitry shall not be so densely placed as to impede maintenance

F. Product Safety: ACS components shall conform to applicable rules and requirements of NFPA 70 and UL

294. ACS components, shall be equipped with instruction plates including warnings and cautions, describing physical safety, and special or important procedures to be followed in operating and servicing ACS equipment.

G. Special Test Equipment: The Contractor shall provide all special test equipment, special hardware, software, tools, and programming or initialization equipment needed to start or maintain any part of the system and its components. Special test equipment is defined as any test equipment not normally used in an electronics maintenance facility.

H. The Contractor shall furnish the ACS complete and ready for operation. The ACS shall operate in a continuous interrogation, control, and response mode.

2.2 FIELD HARDWARE

A. All controllers, reader interfaces, I/O cards or other devices shall be the Mercury Security version rather than the Lenel version.

B. Intelligent controller

1. The family of intelligent controllers and peripheral interface devices must provide an open architecture family of products that enables a choice of host software system vendor without replacement of hardware.
2. The Linux based intelligent controller must provide decision making, event reporting and database storage as a hardware platform. Supports up to 64 doors with peripheral interface devices.
3. The intelligent controller must communicate with the host via on-board 10BaseT/100BaseTX Ethernet port and support TLS encryption as a minimum security implementation.
4. The intelligent controller must be capable of elaborate processes and procedures without host intervention. Once configured, the intelligent controller must function independently of the host, and must be capable of controlling access, managing alarms, interfacing with an array of hardware devices, all while providing the decision-making oversight that each system configuration requires.
5. The controller must provide a fault-tolerant host communication setup in order to efficiently manage a large network of access control panels in any system design.
6. The intelligent controller must provide centralized biometric template management and support a wide range of reader technologies, including OSDP, Wiegand, magnetic stripe and biometric.
7. Controller must support, as a minimum the following open standards, PSIA Area Control, SNMPv3/v2c, OSDP and OSDP SC.
8. The controller must utilize a cryptographic module, like OpenSSL FIPS Object Module RE, that is validated to FIPS 140-2 thus providing a certified implementation of TLS.
9. Connectivity: Connectivity: 10/100 Ethernet. Optional alternate 10/100 Ethernet (using USB/Ethernet converter)
10. Security:
    a) Host/Controller connection protected by TLS 1.2/1.1 or AES-256/128
    b) Controller/IO Expansion connection protected by AES
    c) Generate and load custom peer certificates for TLS
    d) Port based network access control using 802.1X
    e) Crypto memory chip
    f) FIPS 140-2 user of OpenSSL
    g) HTTPS protection for installer web pages
    h) Secure cookies
    i) SNMPv3/v2c
    j) DIP switch toggle sets 5 minute time to disable webpage access
    k) Disable default login credentials
    l) Authorized IP address filtering
    m) IP Client Proxy
    n) Bulk erase controller and periphery devices during replacement
    o) Strong password enforcement
11. Access Control:
    a) 600,000 Cardholder capacity

b) 50,000 Transaction buffer
c) If/Then Macro capability
d) Adjustable cardholder capacity
e) Supports up to 1024 inputs and 1024 outputs

12. Card Formats:
    a) 16 card formats per active reader, 8 per offline reader
    b) Entire card number reported on invalid read
    c) 19 digit (64-bit) User ID and 15 digit PIN numbers maximum
    d) PIV, CAC, TWIC card compatible
    e) 255 Access Levels per cardholder
    f) Activation/Deactivation Date or Date & Times
13. Card Reader Functions (supported via peripheral interface devices)
    a) Multiple card format support by reader
    b) Paired reader support
    c) Alternate reader support
    d) Elevator support
       Turnstile support
    e) Biometric device support
    f) Open Supervised Device Protocol (OSDP) and OSDP SC compliant
    g) Occupancy count
    h) Support of multi-occupancy rules
    i) Anti-passback support
       1) Area-based, reader-based, or time based
       2) Nested area, hard, soft, or timed forgiveness
    j) Supports host-based approval rules
    k) Keypad support with programmable user commands, card input
    l) Shunt relay support
    m) Strike follower relay support
    n) Threat level and Operating Modes
    o) Host controlled OSDP reader passthrough
14. Database Functions
    a) Encrypted database
    b) Configurable card database
    c) Supports up to nineteen (19) digital card numbers
    d) Supports pin codes up to fifteen (15) digits
    e) Programmable card activation and deactivation times and dates
    f) Card issue code up to 32 bits, ADA and VIP flags; PIV (75 bits); Smart Card (200 bits)
    g) Ability to track people and objects
15. Intrusion Alarm Functions
    a) Supports entry delays and exit delays
    b) Area monitoring
    c) Standard alarm masking
    d) Provides control and alarm processing from the keypad
16. Supported Integrations
    a) Regional I/O shares I/O status
    b) Wireless locks
    c) Map Power Supply Alarms and Events using PSIA
    d) Reader firmware and configuration download
    e) Supports up to 1024 inputs and 1024 outputs
17. System Functions
    a) Relay count activations
    b) Interoperability with older host software using Legacy Mode feature
    c) Synchronize time using NTP

2.3 READER INTERFACE

A. The reader interface shall be a single card reader interface panel dedicated to individual door oversight and provide of all the I/O needed for controlling a single door. Each reader interface shall connect one card reader, two general-purpose input monitor points and two control relays for access control and security monitoring to an intelligent controller.

B. Features:
1. AES 128/256 bit data encryption

2. HSPD-12/FIPS201 compliant
3. UL 294 recognized, CE compliant, FCC, RoHS
4. Supports OSDP, OSDP Secure Channel, FICAM government profles, keypads, biometric readers, Wiegand, clock and data, magnetic stripe, F/2F and supervised F/2F reader technologies
5. RS-485 host connectivity
6. Serial I/O

2.4 CARD READER

A. Acceptable Products

1. -Pigtail wired

Model	Part Number
Signo 20	20NKS-00-001BYQ
Signo 40	40NKS-00-001BYQ
Signo 20K	20KNKS-00-001BYQ
Signo 40K	40KNKS-00-001BYQ

2. -Terminal wired

Model	Part Number
Signo 20	20TKS-00-001BYQ
Signo 40	40TKS-00-001BYQ
Signo 20K	20KTKS-00-001BYQ
Signo 40K	40KTKS-00-001BYQ

2.5 FIELD HARDWARE POWER SUPPLIES

A. Power Supplies for field hardware shall be designed specifically for the equipment installed. These power supplies shall be regulated, with battery back-up. All power supplies shall be housed in locked enclosures that also allow mounting space for the ISC, ICM, SRI, or other device/panel required.

2.6 WIRE AND CABLE

A. General: The Contractor shall provide all wire and cable. All wiring shall meet NFPA 70 standards.

B. Terminal Device Wiring: All device wiring shall meet the requirements of the manufacturer of the device.

C. Class 2 Low Energy Conductors: The conductor sizes specified for digital functions shall take precedence over any requirements for Class 2 low energy signal circuit conductors specified elsewhere.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall install all system components in accordance with the manufacturer's instructions, and shall furnish all necessary interconnections, services, and adjustments required for a complete and operable system as specified and shown. Control signal, communications, and data transmission line grounding shall be installed as necessary to preclude ground loops, noise, and surges from affecting system operation.

B. Installation and configuration programming shall be accomplished by Lenel On-Guard certified personnel.

C. Current Site Conditions: The Contractor shall verify that site conditions are in agreement with the design package. The Contractor shall report all changes to the site or conditions that will affect performance of the system to the Owner. The Contractor shall not take any corrective action without written permission from the Owner.

D. Where discrepancies in the construction documents or uncertainties in terms of the intent of the documents exist, contractor shall execute a written Request for Information and forward it to the design team. Contractor shall not be relieved of its obligation under these documents due to its failure to request clarification or additional information in a timely manner.

E. Panels
1. The Control Panel, the Door Reader Modules, expansion boards, and power supplies are to be installed in appropriately sized lockable metal enclosures. The enclosures shall be labeled with the type of component, and the devices served by that component.
2. Contractor to make all required network connections. Any required IP address shall be provided to the contractor by the College for programming of the Network connection.
3. All cable connections to be standard direct cable connections.

F. Field Devices
1. Card Readers to be mounted as shown on the construction drawings.
2. If any Bosch 160 motion detectors are installed, contractor shall wire and make operational the sounder included in the device.

G. System Programming
1. All programming shall be provided by Lenel On-Guard certified programmer.
2. Contractor shall meet with appropriate College personnel to establish the base system programming required for the ACS.
3. Contractor shall document these requirements for review, comment, and approval by the Owner and the Design Team.
4. Upon approval of the configuration requirements, contractor shall configure the systems as documented.

3.2 SYSTEM STARTUP

A. The Contractor shall not apply power to the ACS until after:
1. ACS equipment items have been set up in accordance with manufacturer's instructions.
2. A visual inspection of the ACS has been conducted to insure that defective equipment items have not been installed and that there are no loose connections.
3. System wiring has been tested and verified as correctly connected as indicated.
4. All system grounding and transient protection systems have been verified as properly installed and connected as indicated.
5. Power supplies to be connected to the ACS have been verified as the correct voltage, phasing, and frequency as indicated.

6. Satisfaction of the above requirements shall not relieve the Contractor of responsibility for incorrect installations, defective equipment items, or collateral damage as a result of Contractor work/equipment.

3.3 PERFORMANCE REQUIREMENTS

A. General: The Contractor shall perform pre-delivery testing, site testing, and adjustment of the completed ACS. The Contractor shall provide all personnel, equipment, instrumentation, and supplies necessary to perform all testing.

B. Contractor's Field Testing: The Contractor shall calibrate and test all equipment, verify operation, place the integrated system in service, and test the integrated system.

C. Performance Verification Test: The Contractor shall demonstrate that the completed ACS complies with the contract requirements. Using approved test procedures, all physical and functional requirements of the project shall be demonstrated and shown.

3.4 RECORD DOCUMENTATION

A. Prior to final acceptance of the work, the Contractor shall submit two (2) sets of record documentation.

B. Record documentation shall include:
1. Floor plan drawings indicating device locations and wire routing.
2. Functional block diagrams.
3. List of all IP addresses utilized along with the device to which each address is assigned.
4. Drawings shall be provided in both hard copy and in electronic format. The electronic format shall be the most recent version of AutoCAD.

C. Record documentation shall also include operation and maintenance manuals for all components of the system. Manuals shall include:
1. Installation and Service manuals.
2. Operating manuals.
3. If not included in the above manuals, the Contractor shall provide:
   a) Power up and power down procedures.
   b) Programming procedures.
   c) Maintenance schedules.
   d) Diagnostic procedures.

END OF SECTION 281000

SECTION 283111 – ADDRESSABLE FIRE DETECTION AND ALARM SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Contractor shall provide and install a microprocessor based fire alarm and detection system. The system and components shall be the product of Simplex. Installation shall include all parts, labor, software and hardware necessary to affect a complete installation.

B. Include system internal provisions for future interface to the security system related to the release of egress door upon building evacuation alarms.

C. Include system provisions for interface to the Mass Notification System.

1.03 DEFINITIONS

A. FACP: Fire alarm control panel.

B. LED: Light-emitting diode.

C. NICET: National Institute for Certification in Engineering Technologies.

D. Definitions in NFPA 72 apply to fire alarm terms used in this Section.

1.04 SYSTEM DESCRIPTION

A. Non-coded, addressable system; multiplexed signal transmission dedicated to fire alarm service only. Provide East Garage with new Simplex 4100 ES fire alarm control panel.

1.05 PERFORMANCE REQUIREMENTS

A. Comply with NFPA 72.

B. Fire alarm signal initiation shall be by one or more of the following addressable devices:

1. Manual stations.
2. Smoke detectors.
3. Verified automatic alarm operation of smoke detectors.
4. Heat detectors.
5. Automatic sprinkler system water flow (where applicable).

C. Fire alarm signal shall initiate the following actions:

1. Addressable alarm notification appliances shall operate continuously.
2. Identify alarm at the FACP and remote annunciator(s).
3. Transmit an alarm signal to the remote alarm receiving station.
4. Transmit an alarm signal to the building management system via BACNet.
5. Activate voice/alarm communication system.
6. Initiate the digital alarm communicating transmitter (DACT).
7. Switch heating, ventilating, and air-conditioning equipment controls to fire alarm mode (where applicable).
8. Record events in the system memory.

D. Supervisory signal initiation shall be by one or more of the following devices or actions:

1. Operation of a fire-protection system valve tamper switch (where applicable).
2. Operation of a duct mounted smoke detector.

E. System trouble signal initiation shall be by one or more of the following devices or actions:

1. Open circuits, shorts and grounds of wiring for initiating device, signaling line, and notification-appliance circuits.
2. Opening, tampering, or removal of alarm-initiating and supervisory signal-initiating devices.
3. Loss of primary power at the FACP.
4. Ground or a single break in FACP internal circuits.
5. Abnormal ac voltage at the FACP.
6. A break in standby battery circuitry.
7. Failure of battery charging.
8. Abnormal position of any switch at the FACP or annunciator.

F. System Trouble and Supervisory Signal Actions: Ring trouble bell and annunciate at the FACP and remote annunciator(s).

1.06 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Shop Drawings shall be prepared by persons with the following qualifications:

a. Trained and certified by manufacturer in fire alarm system design.
b. Fire alarm certified by NICET, minimum Level III.

2. System Operation Description: Detailed description for this Project, including method of operation and supervision of each type of circuit and sequence of operations for manually and automatically initiated system inputs and outputs. Manufacturer's standard descriptions for generic systems are not acceptable.
3. Device Address List: Coordinate with final system programming.
4. System riser diagram with device addresses, conduit sizes, and cable and wire types and sizes.

5. Wiring Diagrams: Power, signal, and control wiring. Include diagrams for equipment and for system with all terminals and interconnections identified. Show wiring color code.
6. Batteries: Size calculations.
7. Duct Smoke Detectors: Performance parameters and installation details for each detector, verifying that each detector is listed for the complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
8. Ductwork Coordination Drawings: Plans, sections, and elevations of ducts, drawn to scale and coordinating the installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, the detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
9. Voice/Alarm Signaling Service: Equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram. Include cut sheets and layout of microphone cabinet with selector switches being provided adjacent to the fire alarm annunciator panel.
10. Floor Plans: Indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits.
11. Knox-Vault (Box): Provide cut sheets, installation instructions and monitoring module connection to fire alarm system.

C. Qualification Data: For Installer (refer to 1.07, A for qualification requirements).

D. Field quality-control test reports.

E. Operation and Maintenance Data: For fire alarm system to include in emergency, operation, and maintenance manuals. Comply with NFPA 72, Appendix A, recommendations for Owner's manual. Include abbreviated operating instructions for mounting at the FACP.

F. Submittals to Authorities Having Jurisdiction: In addition to distribution requirements for submittals specified in Division 1 Section "Submittals," make an identical submittal to authorities having jurisdiction. To facilitate review, include copies of annotated Contract Drawings as needed to depict component locations. Resubmit if required to make clarifications or revisions to obtain approval. On receipt of comments from authorities having jurisdiction, submit them to Owner for review. Include proposed graphic annunciator panel within the submittal.

G. Documentation:

1. Approval and Acceptance: Provide the "Record of Completion" form according to NFPA 72 to Owner, and authorities having jurisdiction.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project. Entire installation shall be continuously supervised by a NICET Level III fire alarm technician with a minimum of five years' experience.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined

in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.08 WARRANTY

A. Warranty Period and Coverage: Two years from date of Substantial Completion. Warranty shall cover manufacturer's standard form in which manufacturer and installer agree to repair or replace system devices and equipment that fail in materials or workmanship within specified warranty period. Warranty work shall include all labor on a 24 hour per day, 7 days per week basis. Warranty shall also include an emergency response time within 4 hours for the duration of the warranty period.

B. Provide complete system inspection and testing every 6 months, after the initial installation, testing, and inspection, for the duration of the warranty. Submit a written report of the inspection and test results to the College. Correct all deficiencies found during the inspection and testing of the system. Include these corrections in the written report.

C. All warranty work shall be provided to the College at no additional cost.

1.09 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but not less than 1 unit.
2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but not less than 1 unit.
3. Smoke and Fire Detectors: Quantity equal to 10 percent of amount of each type installed, but not less than 1 unit of each type.
4. Detector Bases: Quantity equal to 2 percent of amount of each type installed, but not less than 1 unit of each type.
5. Keys and Tools: One extra set for access to locked and tamperproofed components.
6. Audible and Visual Notification Appliances: One of each type installed.
7. Fuses: Two of each type installed in the system.

B. In addition to the items listed above, provide the following audible, visual, and combination audible/visual devices inclusive of labor and materials to install after final walk-through by the Fire Marshall:

1. East Garage: 4 audible; 4 visual; 4 combination audible/visual.

Devices shall be installed in locations as directed by Fire Marshal and shall include all cutting, patching, and finishing of all walls and/or ceilings. All unused devices shall be turned over to the Owner for use as spares.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following, no substitution:

1. Fire Alarm System Equipment:

a. Simplex; a Johnson Controls Company. Contact Hamid Zand at 443-277-5145 (hamid.zand@jci.com) for all fire alarm system work at Montgomery College.

2. Wire and Cable:

a. Comtran Corporation.
b. Helix/HiTemp Cables, Inc.; a Draka USA Company.
c. Rockbestos-Suprenant Cable Corporation; a Marmon Group Company.
d. West Penn Wire/CDT; a division of Cable Design Technologies.

2.02 FIRE ALARM CONTROL PANEL

A. General Description:

1. Simplex Model: 4100 ES Series.
2. Modular, power-limited design with electronic modules, UL 864 listed.
3. Addressable microprocessor based fire alarm control panel.
4. Addressable initiation devices that communicate device identity and status.

a. Smoke sensors shall additionally communicate sensitivity setting and allow for adjustment of sensitivity at the FACP.
b. Temperature sensors shall additionally test for and communicate the sensitivity range of the device.

5. Addressable control circuits for operation of mechanical equipment.
6. Addressable notification appliances.

B. Alphanumeric Display and System Controls: Arranged for interface between human operator at the FACP and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, three lines of 80 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands; and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.

C. Circuits:

1. Signaling Line Circuits: NFPA 72, Class B, Style 4.

a. System Layout: Install no more than 50 addressable devices on each signaling line circuit.

2. Notification-Appliance Circuits: NFPA 72, Class B, Style Y.
3. Actuation of alarm notification appliances, emergency voice communications, annunciation, elevator recall, and activation of suppression system (where applicable) shall occur within 10 seconds after the activation of an initiating device.
4. Provide main fire alarm panel with dual class A IDNAC isolator modules (Simplex 4100-6103) to isolate devices per floor and per each side of floor.

D. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm verification" signal at the FACP.
2. Activate a listed and approved "alarm verification" sequence at the FACP and the detector.
3. Record events by the integral memory.
4. Sound general alarm if the alarm is verified.
5. Cancel FACP indication and system reset if the alarm is not verified.

E. Notification-Appliance Circuit: Operation shall sound in a temporal pattern, complying with ANSI S3.41.

F. Power Supply for Supervision Equipment: Supply for audible and visual equipment for supervision of the ac power shall be from a dedicated dc power supply, and power for the dc component shall be from the ac supply.

G. Alarm Silencing, Trouble, and Supervisory Alarm Reset: Manual reset at the FACP and remote annunciators, after initiating devices are restored to normal.

1. Silencing-switch operation halts alarm operation of notification appliances and activates an "alarm silence" light. Display of identity of the alarm zone or device is retained.
2. Subsequent alarm signals from other devices or zones reactivate notification appliances until silencing switch is operated again.
3. When alarm-initiating devices return to normal and system reset switch is operated, notification appliances operate again until alarm silence switch is reset.

H. Walk Test: A test mode to allow one person to test alarm and supervisory features of initiating devices. Enabling of this mode shall require the entry of a password. The FACP and annunciators shall display a test indication while the test is underway. If testing ceases while in walk-test mode, after a preset delay, the system shall automatically return to normal.

I. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and control of changes in those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and make a print-out of the final adjusted values from the integral memory.

J. Transmission to Remote Alarm Receiving Station

1. Provide digital alarm communication transmitter (DACT) for supervisory and alarm signals via two telephonic lines. Transmitted information shall

include alarm initiating device and location, similar to information listed on the control panel LCD display.

2. Provide all network ports and RS 232 jacks.
3. Provide BACNet remote annunciation provisions.

K. Voice/Alarm Signaling Service: A central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided as a special module that is part of the FACP.

1. Indicated number of alarm channels for automatic, simultaneous transmission of different announcements to different zones, or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall be UL 1711 listed.

a. Allow the application of and evacuation signal to indicated number of zones and, at the same time, allow voice paging to the other zones selectively or in any combination.
b. Programmable tone and message sequence selection.
c. Standard digitally recorded messages for "Evacuation" and "All Clear."
d. Generate tones to be sequenced with audio messages of the type recommended by NFPA 72 and that are compatible with tone patterns of the notification-appliance circuits of the FACP.

2. Notification-Appliance Circuits: NFPA 72, Class B.
3. Status Annunciator: Indicate the status of various voice/alarm speaker zones and the status of firefighters' two-way telephone communication zones.
4. Preamplifiers, amplifiers, and tone generators shall automatically transfer to backup units, on primary equipment failure.
5. Amplifiers shall be adequately sized to power all speakers at 0.5 watt tap setting.
6. Speaker zones shall include as a minimum the following: elevator cabs, egress stairways, building exterior, each floor and an “all call” zone.

L. Ports: Ports shall be RS-232 for connection to external peripheral equipment. The port shall allow remote access to the FACP for programming changes and system diagnostic routines. Access by a remote terminal shall be by encrypted password algorithm.

M. On receipt of signal, store on integral memory alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble), and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also store system reset event, including the same information for device, location, date, and time. Commands initiate the storing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.

N. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signal and supervisory signal shall be powered by the 24-V dc source.

1. The alarm current draw of the entire fire alarm system shall not exceed 80 percent of the power-supply module rating.

O. Secondary Power: 24-V dc supply system with batteries and automatic battery charger and an automatic transfer switch.

1. Batteries: Sealed lead calcium.
2. Battery and Charger Capacity: Comply with NFPA 72.

P. Surge Protection:

1. Install surge protection on normal ac power for the FACP and its accessories. Surge protection shall be integral to the FACP.

Q. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

R. Security System Interface: Addressable relays for interface to the existing or future security system.

2.03 MANUAL FIRE ALARM BOXES

A. Description: UL 38 listed; finished in red with molded, raised-letter operating instructions in contrasting color. Station shall show visible indication of operation. Mounted on recessed outlet box; if indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type. With integral addressable module, arranged to communicate manual-station status (normal, alarm, or trouble) to the FACP.
2. Station Reset: Key- or wrench-operated switch.
3. Manual pull stations installed in exterior and wet locations shall be watertight and listed for wet locations.

2.04 SYSTEM SMOKE DETECTORS

A. General Description:

1. UL 268 listed, operating at 24-V dc, nominal.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.
3. Plug-in Arrangement: Detector and associated electronic components shall be mounted in a plug-in module that connects to a fixed base. Provide terminals in the fixed base for connection of building wiring.
4. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
5. Integral Visual-Indicating Light: LED type. Indicating detector has operated status.
6. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at the FACP for calibration, sensitivity, and alarm condition, and individually adjustable for sensitivity from the FACP.

7. Photoelectric Smoke Sensors shall have 7 selectable sensitivity levels programmed and monitored from the FACP.
8. Detectors shall combine photoelectric smoke sensing and heat sensing technologies. An alarm shall be determined by either smoke detection, with selectable sensitivity from 0.65 to 11.6 %/meter obscuration; or heat detection, selectable as fixed temperature or fixed with selectable rate-of-rise; or based on an analysis of the combination of smoke and heat activity.
9. Smoke detectors installed in unconditioned spaces shall be UL Listed for the type of area where being installed.

B. Duct Smoke Detectors:

1. Photoelectric Smoke Detectors:

a. Sensor: LED or infrared light source with matching silicon-cell receiver.
b. Detector Sensitivity: Between 2.5 and 3.5 percent/foot smoke obscuration when tested according to UL 268A.

2. UL 268A listed, operating at 24-V dc, nominal.
3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.
4. Plug-in Arrangement: Detector and associated electronic components shall be mounted in a plug-in module that connects to a fixed base. The fixed base shall be designed for mounting directly to the air duct. Provide terminals in the fixed base for connection to building wiring.
5. Self-Restoring: Detectors shall not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type. Indicating detector has operated status.
7. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at the FACP for calibration, sensitivity, and alarm condition, and individually adjustable for sensitivity from the FACP. Provide with remote test switch and indicator light when indicated on the drawings.
8. Each sensor shall have multiple levels of detection sensitivity.
9. Sampling Tubes: Design and dimensions as recommended by manufacturer for the specific duct size, air velocity, and installation conditions where applied.
10. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

2.05 HEAT DETECTORS

A. General: UL 521 listed.

B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 degree F or rate-of-rise of temperature that exceeds 15 degree F per minute, unless otherwise indicated.

1. Mounting: Plug-in base, interchangeable with smoke-detector bases.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.

2.06 NOTIFICATION APPLIANCES

A. Description: Equipped for mounting as indicated and with screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly.
2. All notification appliances shall be addressable.
3. Devices installed in exterior and wet locations shall be watertight and listed for wet locations.

B. Visible Alarm Devices: Xenon strobe lights listed under UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "ALERT" is engraved in minimum 1-inch-high letters on the lens.

1. Rated Light Output: 15 candela minimum with field electability from 15 to 75 candela unless otherwise indicated.
2. Adjustable Candela Output: Field adjustable at the device or programmable from the FACP when the device dip switch is set to “Auto”.
3. Strobe Leads: Factory connected to screw terminals.

C. Voice/Tone Speakers:

1. UL 1480 listed.
2. Low-Range Units: Rated 1 to 2 W.
3. Mounting: Flush, semi-recessed, or surface mounted; bidirectional as indicated.
4. Matching Transformers: Tap range matched to the acoustical environment of the speaker location.

2.07 REMOTE FIREFIGHTERS' COMMUNICATION SERVICE

A. Dedicated, supervised, push-to-talk microphone voice communication links located at the FACP and graphic annunciator panel(s). Supervised telephone lines shall be connected to talk circuits. Activation of either microphone activates each individual zone or all speakers for announcements, depending on which zone activation buttons have been selected. Microphone shall have higher priority than evacuation message. Provide the microphone in a factory red finish glass door cabinet mounted adjacent to the remote annunciator.

2.08 REMOTE ANNUNCIATOR

A. Description: Duplicate annunciator functions of the FACP for alarm, supervisory, and trouble indications. Also duplicate manual switching functions of the FACP, including acknowledging, silencing, resetting, and testing.

1. Mounting: Surface cabinet, NEMA 250, Class 1 at the Main Lobby (locations identified on the floor plans).

B. Display Type and Functional Performance: Alphanumeric display same as the FACP. Controls with associated LEDs permit acknowledging, silencing,

resetting, and testing functions for alarm, supervisory, and trouble signals identical to those in the FACP.

C. Annunciator panel shall be smoked Plexiglas, back lighted with appropriate LEDs. Provide floor plan graphics using photo emulsion material to duplicate floor plans.

D. Submit annunciator panel shop drawing to Fire Marshal for their review and approval, and obtain their final approval, prior to manufacturing annunciator panel.

2.09 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module listed for use in providing a system address for listed alarm-initiating devices for wired applications with normally open contacts.

B. Integral Relay: Capable of providing a direct signal to the elevator controller to initiate elevator recall and to a circuit-breaker shunt trip for power shutdown.

2.10 WIRE AND CABLE

A. Wire and cable for fire alarm systems shall be UL listed and labeled as complying with NFPA 70, Article 760.

B. Signaling Line Circuits: Twisted, shielded pair, not less than No. 18 AWG and size as recommended by system manufacturer.

1. Circuit Integrity Cable: Twisted shielded pair, NFPA 70 Article 760, Classification CI, for power-limited fire alarm signal service. UL listed as Type FPL, and complying with requirements in UL 1424 and in UL 2196 for a 2-hour rating.

C. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation.

1. Low-Voltage Circuits: No. 16 AWG, minimum.
2. Line-Voltage Circuits: No. 12 AWG, minimum.
3. Multi-conductor Armored Cable: NFPA 70 Type MC, copper conductors, TFN/THHN conductor insulation, copper drain wire, galvanized steel armor, red striped, UL listed for fire alarm and cable tray installation, plenum rated, and complying with requirements in UL 2196 for a 2-hour rating.

PART 3 - EXECUTION

3.01 PHASING OF THE WORK

A. Initiate a fire watch whenever existing system is not operational. Contractor shall include staff as required for fire watch and shall coordinate exact requirements with AHJ and College. Remove existing fire alarm system components complete after replacement components are installed, tested, approved and fully operational. Reuse existing outlets for the installation of new fire alarm system devices such as manual striking stations where possible (coordinate with College which device locations can be reused – if any). Reuse existing concealed

raceways in wall to these outlets for the provision of new system wiring. This process will avoid use of exposed wiring on existing finished surfaces.

B. At the completion of the work, inspect and test system.

3.02 EQUIPMENT INSTALLATION

A. Smoke or Heat Detector Spacing:

1. Smooth ceiling spacing shall not exceed the rating of the detector.
2. Spacing of heat detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas, shall be determined according to Appendix A in NFPA 72.
3. Spacing of heat detectors shall be determined based on guidelines and recommendations in NFPA 72.

B. HVAC: Locate detectors not closer than 3 feet from air-supply diffuser or return-air opening.

C. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of the duct. Provide remote test station with indicator light where indicated on the drawings.

D. Remote Status and Alarm Indicators: Install near each smoke detector, duct smoke detector controlling smoke dampers, and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.

E. Audible Alarm-Indicating Devices: Install as indicated on the drawings.

F. Visible Alarm-Indicating Devices: Install as indicated on the drawings.

G. Device Location-Indicating Lights: Locate in public space near the device they monitor.

H. FACP: Surface mount with tops of cabinets not more than 72 inches above the finished floor.

I. Annunciator: Install with top of panel not more than 72 inches above the finished floor. Surface mount the cabinet at the Second Floor and fabricate a chase above the cabinet to conceal all wiring to the annunciator panel and simulate the installation of a flush cabinet. Coordinate final arrangement with the College.

3.03 WIRING INSTALLATION

A. Install wiring according to the following:

1. NECA 1.
2. TIA/EIA 568-A.
3. Addressable loop shall be wired Class B, Style 4.
4. Initiating devices shall be wired Class B, Style B.
5. Notification devices shall be wired Class B, Style Y.
6. When transponder panels are required, wiring through panel shall be Class

A, Style 6.

B. Wiring Method: Install wiring in metal raceway according to Division 26 Section "Raceways". Provide raceways and cables in accordance with the following:

1. Major system distribution and Risers: Provide conductor in red painted metal raceway (IMC) for all system wiring between the FACP, voice evacuation control panel (VACP), all Fire Alarm Terminal Cabinets (FATC) and Fire Alarm Extender Panels (FAEP) as indicated on the drawings. Terminate all system conductors on screw terminal strips in each FATC. Provide a minimum of 50 percent spare conductors for alarm initiating circuits, alarm notification circuits and other control wiring associated with the fire alarm system. Terminate spare conductors on screw terminal strips in each FATC. Label each system conductors terminating in the FACT and provide a typed legend in the cover of the FATC identifying all active and spare conductors. These conductors will be considered and labeled on the drawing as the back bone of the system and are intended to meet future system wiring needs.
2. Lateral distribution system: Provide conductors in red painted metal raceway (IMC).
3. Annunciator Panel: Provide system conductors in red painted metal raceway (IMC) from the FACP to the remote annunciator panel. Provide a minimum of 50 percent spare conductors in the raceway and terminate spare conductors on terminal strips.
4. Firefighter's communication station: Provide system conductors in red painted metal raceway (IMC) from the FACP to the remote station located adjacent to the graphic annunciator panel(s).
5. Fire alarm circuits and equipment control wiring associated with the fire alarm system shall be installed in a dedicated raceway system. This system shall not be used for any other wire or cable.
6. All fire alarm wiring shall be run in IMC raceway. EMT raceway is prohibited.

C. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated or interrupted in any enclosure associated with the fire alarm system to screw terminal strips. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

D. Cable Taps: Use numbered screw terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.

E. Color-Coding: Color-code fire alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and a different color-code for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire alarm system junction boxes and covers red.

F. Wiring to Remote Alarm Transmitting Device: 1-inch conduit between the FACP and the remote equipment. Install number of conductors and electrical supervision for connecting wiring as needed to suit monitoring function.

3.04 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Basic Electrical Materials and Methods."

B. Install instructions frame in a location visible from the FACP.

C. Paint existing power-supply disconnect switch or circuit breaker red and label "FIRE ALARM."

3.05 GROUNDING

A. Ground the FACP and associated circuits; comply with IEEE 1100. Install a copper ground wire from main service ground to FACP.

3.06 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. Before requesting final approval of the installation, submit a written statement using the form for Record of Completion shown in NFPA 72.
2. Perform each electrical test and visual and mechanical inspection listed in NFPA 72. Certify compliance with test parameters. All tests shall be conducted under the direct supervision of a NICET technician certified under the Fire Alarm Systems program at Level III.
3. Visual Inspection: Conduct a visual inspection before any testing. Use as-built drawings and system documentation for the inspection. Identify improperly located, damaged, or nonfunctional equipment, and correct before beginning tests.
4. Testing: Follow procedure and record results complying with requirements in NFPA 72.
5. Test and Inspection Records: Prepare according to NFPA 72, including demonstration of sequences of operation by using the matrix-style form in Appendix A in NFPA 70.

C. All wiring shall be tested for the following conditions before devices are installed or circuits connected to control equipment:

1. Verify that stray (unwanted) voltages do not exist between the installation conductors and ground or between conductors.

2. Verify all conductors not intentionally grounded are isolated from ground using an approved insulation testing device or "megger."

3. Verify that all conductors not intentionally connected together are isolated from one another using an approved insulation testing device or "megger."

4. Measure and record the loop resistance of each circuit with the conductor pair shorted together at the far end, verify that loop resistance does not exceed manufacturer's requirements.

5. Supply the Owner and Engineer with a copy of all circuit testing reports and loop resistance readings.

D. All initiating and indicating appliances, control equipment, accessories and auxiliary functions shall be tested in accordance with NFPA 72 acceptance test procedures. Representatives of the College, Engineer and local Fire Marshal shall be notified of the date and time of the test. A minimum of fourteen (14) days' notice is required when scheduling the acceptance test. The Contractor is responsible for conducting all required tests. All necessary equipment and supplies shall be provided at Contractor's expense, including ladders, radios, test equipment, volt-ohm meter, sound-pressure (decibel) meter, flashlights, hand tools and smoke or smoke substitute for functional tests. All test procedures shall conform to the manufacturer's recommended test procedures and the NFPA 72 recommended practice. Subcontractors responsible for related work connected to or controlled by the fire detection and alarm system shall be available to demonstrate their equipment at the time of acceptance testing.

3.07 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project outside normal occupancy hours for this purpose.

B. Follow-Up Tests and Inspections: After date of Substantial Completion, test the fire alarm system complying with testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for three monthly, and one quarterly, periods.

C. Annual Test and Inspection: One year after date of Substantial Completion, test the fire alarm system complying with the testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for monthly, quarterly, semiannual, and annual periods. Use forms developed for initial tests and inspections.

3.08 DEMONSTRATION AND TRAINING

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the fire alarm system, appliances, and devices. Refer to Section "Closeout Procedures." Provide a minimum of eight (8) hours of training.

END OF SECTION 283111

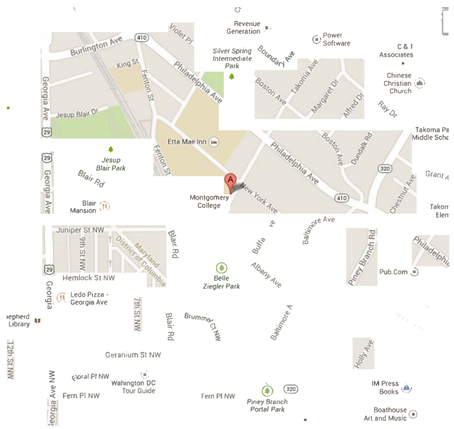
MONTGOMERY COLLEGE

EAST GARAGE FIRE ALARM UPGRADE

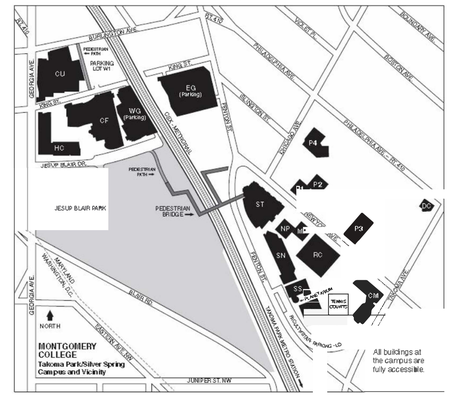
PHASE NO. 3

Takoma Park Campus

SITE MAP



CAMPUS MAP



Montgomery College
Takoma Park/Silver Spring Campus
7600 Takoma Avenue
Takoma Park, MD 20912
240-567-1300
TTY 301-587-7207
www.montgomerycollege.edu
For updates to campus maps, visit www.montgomerycollege.edu/maps.

Takoma Park/Silver Spring Campus Legend of Buildings
(as of April 2011)

- CF The Morris and Gwendolyn Cafritz Foundation Arts Center
- CM The Commons
- CU Cultural Arts Center
- DC Child Care Center
- EG East Garage (parking)
- FH Falcon Hall (Physical Education)
- HC Health Sciences Center (Workforce Development & Continuing Education – WDCE)
- MP Mathematics Pavilion
- NP North Pavilion
- P1 Pavilion One
- P2 Pavilion Two
- P3 Pavilion Three
- P4 Pavilion Four (Refugee Training Center)
- RC Resource Center
- SN Science North Building
- SS Science South Building (Planetarium)
- ST Charlene R. Nunley Student Services Center (Security Office and Admissions Office)
- WG West Garage (parking)

DRAWING INDEX

DWG. No.	DESCRIPTION
COV	COVER SHEET
A1.01	EG: LEVEL 1 PLAN - ARCHITECTURAL
M1.01	EG: LEVEL 1 PLAN - MECHANICAL - NEW WORK
E0.01	ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES & DETAILS
E1.01	EG: LEVEL 1 PLANS - FIRE ALARM - DEMOLITION
E1.02	EG: LEVEL 2 PLANS - FIRE ALARM - DEMOLITION
E1.03	EG: LEVEL 3 PLANS - FIRE ALARM - DEMOLITION
E1.04	EG: LEVEL 4 PLANS - FIRE ALARM - DEMOLITION
E1.05	EG: LEVEL 5 PLANS - FIRE ALARM - DEMOLITION
E1.06	EG: LEVEL 1 PLANS - FIRE ALARM - NEW WORK
E1.07	EG: LEVEL 2 PLANS - FIRE ALARM - NEW WORK
E1.08	EG: LEVEL 3 PLANS - FIRE ALARM - NEW WORK
E1.09	EG: LEVEL 4 PLANS - FIRE ALARM - NEW WORK
E1.10	EG: LEVEL 5 PLANS - FIRE ALARM - NEW WORK
E2.01	TELECOM DETAILS
E2.02	CAMPUS CONNECTION DETAIL
E2.11	FIRE ALARM RISER DIAGRAM
E3.00	POWER RISER DIAGRAM - DEMOLITION & NEW WORK & PANEL SCHEDULES

bkm
Burdette, Koehler, Murphy & Associates, Inc.
Mechanical / Electrical Engineers
6300 Blair Hill Lane, Suite 400
Baltimore, Maryland 21209
P: 410.323.0600 | www.bkma.com

BKM PROJECT NO. 13058.06
DECEMBER 19, 2025
100% FOR CONSTRUCTION

OWNER'S SUSTAINABILITY STATEMENT

AS GOOD STEWARDS, IT IS MONTGOMERY COLLEGE'S GOAL TO FURNISH AND MAINTAIN SUSTAINABLE FACILITIES WHICH ARE SAFE, RELIABLE, LIFE CYCLE COST EFFECTIVE, ENVIRONMENTALLY FRIENDLY, AND CONFORM TO OWNER'S PROJECT REQUIREMENTS (OPR). THESE FACILITIES EXIST TO PROVIDE A QUALITY BUILT ENVIRONMENT WHICH ENHANCES THE LEARNING EXPERIENCE AND CONTRIBUTES TO STUDENT SUCCESS. TO ACHIEVE THIS GOAL MONTGOMERY COLLEGE EMBRACES A TOTAL QUALITY PROCESS WHICH RELIES ON THE VISION, TALENTS, AND COLLABORATION OF ALL INDIVIDUALS INVOLVED OR AFFECTED BY THIS PROJECT.

REV. 1, DECEMBER 1, 2014

PROJECT SUMMARY

1. **PROVIDE ALL WORK REQUIRED FOR A COMPLETE AND OPERATIONAL MNS SYSTEM UNDER THIS PROJECT. ALL WORK IS PART OF THIS CONTRACT UNLESS SPECIFICALLY NOTED AS BEING FURNISHED AND INSTALLED BY THE COLLEGE.**
2. **PROVIDE REPLACEMENT FIRE ALARM SYSTEM IN EAST GARAGE INCLUSIVE OF EXTERIOR A/V DEVICES SHOWN ON THE DRAWINGS.**
3. **INTERCONNECT NEW FIRE ALARM CONTROL PANEL (FACP) IN EAST GARAGE TO THE COLLEGE'S IT FIBER OPTIC NETWORK VIA FIBER MODEMS. FIBER OPTIC CABLING BETWEEN FACILITIES ON TAKOMA PARK CAMPUS EXISTS. THE COLLEGE WILL PROVIDE FIBER OPTIC CABLE TO CONNECT FIBER MODEMS TO THE COLLEGE FIBER NETWORK. FIBER OPTIC CABLE WILL BE PROVIDED BY THE COLLEGE. FINAL CONNECTION OF THE FIBER CABLE TO THE FIBER MODEMS IS THE RESPONSIBILITY OF THE CONTRACTOR. THE MODEMS ARE PART OF THE FIRE ALARM SYSTEM WORK TO BE PROVIDED UNDER THIS CONTRACT.**
4. **PROVIDE INTERCONNECTION CABLE, CONNECTIONS, PROGRAMMING, ETC. TO INTERFACE THE FACP TO THE IT RACK EQUIPMENT IN EAST GARAGE.**
5. **CONSTRUCT NEW TELECOM ROOM.**
6. **PROVIDE ACCESS CONTROL/CARD READERS ON DOORS INDICATED ON THE DRAWNGS.**
7. **UPGRADE ELECTRICAL SERVICE EQUIPMENT SERVING EAST GARAGE. COORDINATE POWER OUTAGES, AND DISCONNECTION AND RECONNECTION OF EXISTING SERVICE CONDUCTORS WITH PEPCO.**

bkm
Burdette, Koehler, Murphy & Associates, Inc.
Mechanical / Electrical Engineers
6300 Blair Hill Lane, Suite 400
Baltimore, Maryland 21209
P: 410.323.0600 | www.bkma.com

PROJECT NAME:

Montgomery College

MONTGOMERY COLLEGE

Central Administration
Office of Facilities
40 W Gude Drive, Suite 200
Rockville, MD 20850
Telephone: 240-567-7363

EAST GARAGE FIRE ALARM UPGRADE
PHASE No.3
at
Montgomery College
Takoma Park
Campus

SEAL:

PROFESSIONAL CERTIFICATION:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. _____,
EXPIRATION DATE:

ISSUED FOR:

DATE	DESCRIPTION
2/25/22	95% CD SUBMISSION
11/18/22	95% CD RESUBMISSION
3/17/23	100% CD SUBMISSION
3/29/24	100% FOR CONSTRUCTION
12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: **12/19/2025**

SHEET TITLE:

COVER SHEET

DRAWING NO:

COV

BKM: 13058.06

Plotted: Nov 12, 2025 - 2:22:28 PM
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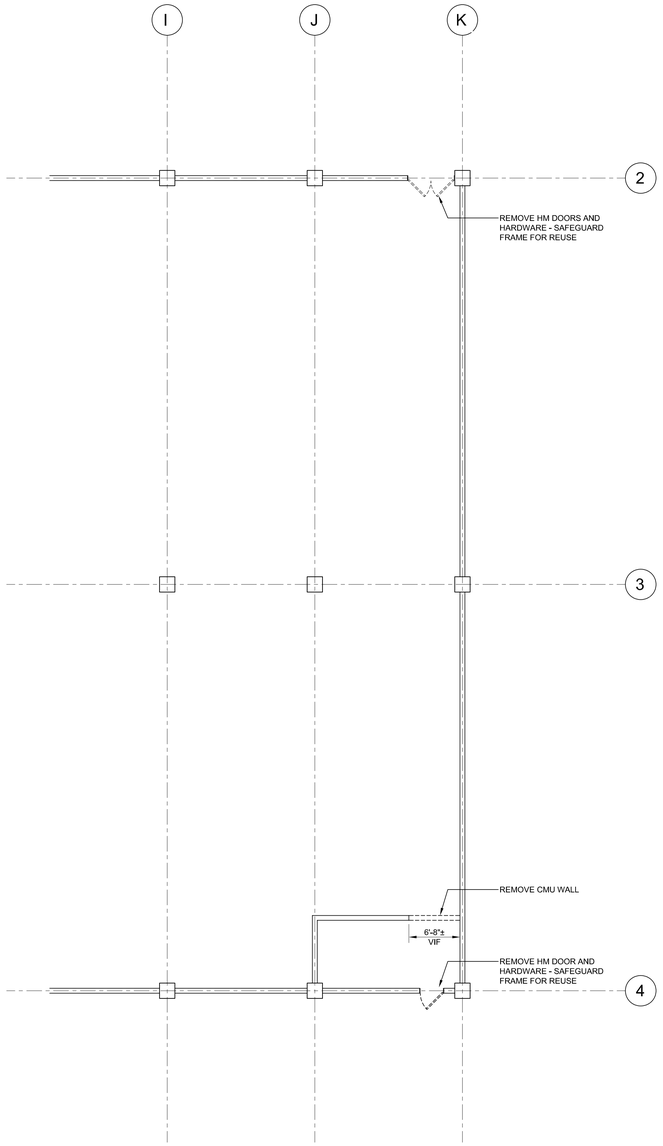
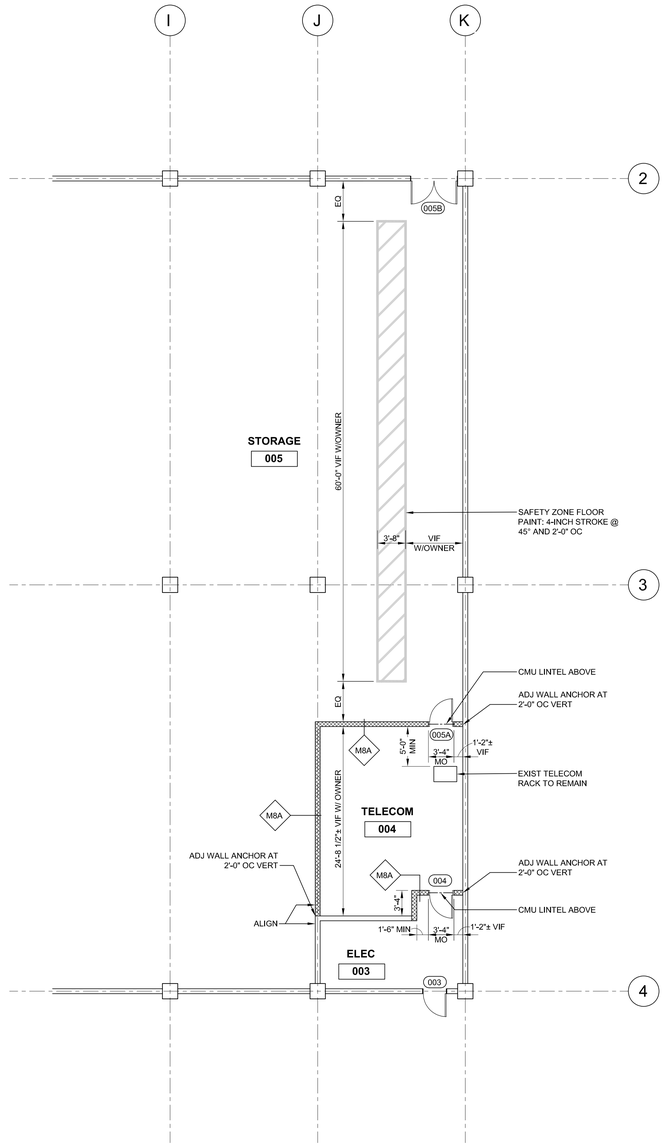


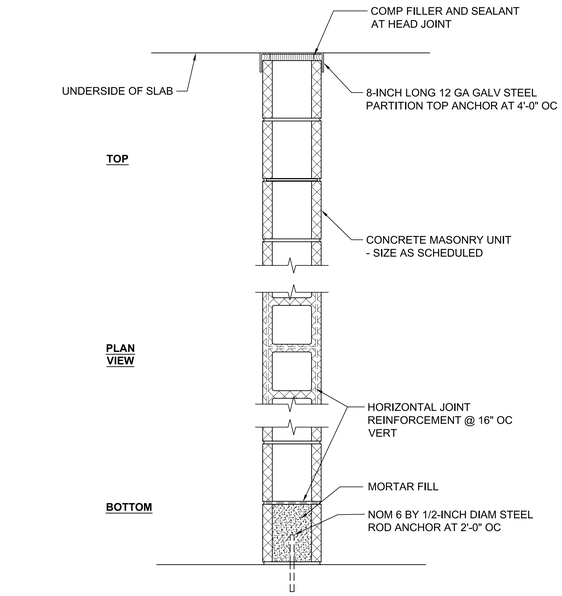
C1 A101 PARTIAL LEVEL ONE DEMOLITION PLAN

1/8" = 1'-0"



C4 A101 PARTIAL LEVEL ONE PLAN

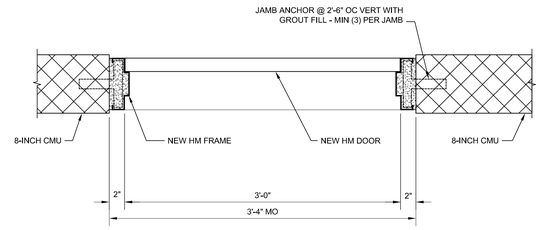
1/8" = 1'-0"



TYPE M PARTITIONS				
TYPE	CORE SIZE	THICKNESS	UL TEST	STC
M8A	8"	7 5/8"	-	-

1 A101 PARTIAL LEVEL ONE DEMOLITION PLAN

1 1/2" = 1'-0"



C8 A101 HOLLOW METAL DOOR JAMB

1 1/2" = 1'-0"

GENERAL NOTES

1. VERIFY ALL DIMENSIONS IN FIELD
2. DIMENSIONS ARE TO FINISH FACE UNO

LEGEND

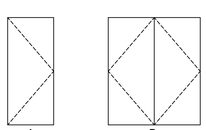
- EXISTING PARTITION TO REMAIN
- EXISTING DOOR TO REMAIN
- EXISTING PARTITION TO BE REMOVED
- EXISTING DOOR TO BE REMOVED
- NEW CMU PARTITION
- NEW HM DOOR AND FRAME

GRAPHIC SCALES

0 3" 6" 1' 2"
SCALE: 1 1/2"=1'-0"

0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

DOOR AND FRAME LEGEND



A FLUSH

B PAIR FLUSH

FRAME TYPE 1

DOOR SCHEDULE

OPENING		DOOR						FRAME					HDW SET	NOTES
NO	LOCATION	WD	HT	THK	TYPE	MAT	FIN	TYPE	MAT	FIN	HEAD	JAMB		
003	ELECTRIC ROOM	3' - 0"	6'-8"	1-3/4"	A	HM	PTD	EXIST HM FRAME					A	VERIFY FRAME SIZE IN FIELD
004	TELECOM ROOM	3' - 0"	6'-8"	1-3/4"	A	HM	PTD	1	HM	PTD	NOM 2" H	NOM 2" W	B	
005A	STORAGE ROOM	3' - 0"	6'-8"	1-3/4"	A	HM	PTD	1	HM	PTD	NOM 2" H	NOM 2" W	C	
005B	STORAGE ROOM	6' - 0"	6'-8"	1-3/4"	B	HM	PTD	EXIST HM FRAME					D	VERIFY FRAME SIZE IN FIELD

bkm
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PROJECT NAME:

Montgomery College

MONTGOMERY COLLEGE

Central Administration
Office of Facilities
40 W Gude Drive, Suite 200
Rockville, MD 20850
Telephone: 240-567-7363

EAST GARAGE FIRE ALARM UPGRADE PHASE No.3 at Montgomery College Takoma Park Campus

SEAL:

PROFESSIONAL CERTIFICATION:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. _____. EXPIRATION DATE: _____

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12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **JAS**

CHECKED BY: **JAS**

DATE: 12/19/2025

SHEET TITLE:

MC TPSS - EAST GARAGE FLOOR PLANS

DRAWING NO:

A101

BKM: 13058.06

Plotted By: James Smith | 12/19/2025 6:12 PM ARL: \\aulnevans.com\JE\Projects\2022\42241650_MC_TakomaPark\EG\05_Dwgs\02_AutoCAD\42241650_A101

DUCTLESS SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

AREA SERVED	DESIGNATION		CFM	UNIT TYPE	SEER	COOLING		ELECTRICAL CHARACTERISTICS							BASIS OF DESIGN		REMARKS
	INDOOR UNIT	OUTDOOR UNIT				TOTAL MBH	SENS MBH	INDOOR			OUTDOOR				MANUFACTURER	MODEL	
								MIN AMPACITY	VOLTS	PHASE	MIN AMPACITY	VOLTS	PHASE	MOCP			
TELECOM ROOM	AC-1	CU-1	705	WALL MOUNTED	20.3	36.0	25.0	1.0	208	1	34.0	208	1	56.0	MITSUBISHI	PKA / PUZ	HEAT PUMP

NOTES:

1. PROVIDE DOUBLE SUCTION REFRIGERANT PIPING RISERS AND TRAPS AS RECOMMENDED BY MANUFACTURER. QUANTITY AND SIZES OF REFRIGERANT PIPING SHALL BE AS RECOMMENDED BY MANUFACTURER.
2. PROVIDE ASPEN MINI LIME CONDENSATE PUMP WITH ALL WALL MOUNTED UNITS.
3. COOLING CAPACITIES INDICATED SHALL BE AT 72°F / 50% RH RETURN AIR AND 100°F OUTSIDE AIR.
4. PROVIDE LOW AMBIENT KIT TO ALLOW FOR COOLING DOWN TO 0°F.
5. INDOOR UNITS SHALL BE POWERED FROM OUTDOOR UNITS THROUGH FIELD SUPPLIED INTERCONNECTED WIRING.
6. UNITS SHALL BE PROVIDED WITH WALL MOUNTED THERMOSTATS. SETPOINTS SHALL BE 72°F IN COOLING AND 70°F IN HEATING. UNITS SHALL BE PROVIDED WITH BACNET COMPATIBILITY FOR CONNECTION TO THE BAS.

ATC GENERAL NOTES

MC023

1. ALL ATC WORK SHALL BE PROVIDED BY RELIABLE CONTROLS BY PRITCHETT, INC.
2. THE ATC WORK SHALL INCLUDE PROVISIONS FOR A COMPLETE AND OPERABLE CONTROL SYSTEM, INCLUDING ALL DEVICES REQUIRED TO ACHIEVE THE SEQUENCES AND FUNCTIONS INDICATED THROUGHOUT THE CONTRACT DOCUMENTS.
3. THE ATC CONTRACTOR SHALL FURNISH AND INSTALL ALL ELECTRICAL WIRING AND CONDUIT FROM POWER SOURCE, INCLUDING TERMINATION TO ALL REQUIRED ATC RELATED POWER CONNECTIONS INCLUDING, BUT NOT LIMITED TO, DDC CONTROLLERS, SENSORS, ATC PANELS, ETC. THE ATC CONTRACTOR SHALL OBTAIN A SEPARATE ELECTRICAL PERMIT AS REQUIRED BY THE LOCAL AUTHORITY. THE ATC CONTRACTOR SHALL BE WHOLLY RESPONSIBLE FOR ALL POWER REQUIREMENTS NECESSARY FOR A COMPLETE INSTALLATION FROM THE POWER SOURCE TO ALL ATC RELATED CONNECTIONS.
4. THE ATC CONTRACTOR SHALL COORDINATE AND VERIFY THAT ALL CONTROLLERS, DEVICES AND ACCESSORIES ARE PROVIDED AS REQUIRED TO ACCOMPLISH ALL CONTROL FUNCTIONS AND SEQUENCES INDICATED IN THE CONTRACT DOCUMENTS. WHERE CONTROL RELATED DEVICES ARE NOT PROVIDED BY AN EQUIPMENT MANUFACTURER, IT SHALL BE THE RESPONSIBILITY OF THE ATC CONTRACTOR TO PROVIDE THE CONTROL DEVICES REQUIRED TO ACCOMPLISH THE FUNCTIONS AND SEQUENCES INDICATED.
5. THE ATC CONTRACTOR SHALL PROVIDE ALL CONTROLLERS, ATC PANELS, DEVICES, POINTS, ETC REQUIRED TO ACCOMPLISH THE CONTROL SEQUENCES AND FUNCTIONS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS. ALL POINTS SHALL BE TIED INTO THE ENERGY MANAGEMENT CONTROL SYSTEM (EMCS). IN ADDITION, THE ATC CONTRACTOR SHALL PROVIDE ALL CONTROLLERS, DEVICES, POINTS, ETC REQUIRED TO CONTROL, OPERATE AND MONITOR ALL EQUIPMENT (IE. AIR CONDITIONING UNITS, AIR VOLUME TERMINALS, FLOW MEASURING DEVICES, SENSORS, ETC.) INDICATED THROUGHOUT THE CONTRACT DOCUMENTS.
6. ALL AIR HANDLING EQUIPMENT (I.E. SPLIT SYSTEM AC UNITS, ETC.) WITH A COOLING COIL SHALL BE EQUIPPED WITH A CONDENSATE WATER-LEVEL DETECTION DEVICE CONFORMING TO UL 508 WHICH SHALL SHUT OFF THE EQUIPMENT SERVED IN THE EVENT THAT THE PRIMARY DRAIN IS BLOCKED. THE DEVICE SHALL BE INSTALLED IN THE EQUIPMENT-SUPPLIED DRAIN PAN AT A POINT HIGHER THAN THE PRIMARY DRAIN LINE CONNECTION AND BELOW THE OVERFLOW RIM OF SUCH PAN. ALL CONDENSATE PUMP BASINS SHALL ALSO BE PROVIDED WITH A WATER-LEVEL DETECTION DEVICE THAT SHUTS OFF EQUIPMENT SERVED WHEN OVERFLOW IS SENSED. LEAK DETECTION FOR ALL UNITS SHALL ALSO ALARM AT THE BUILDING AUTOMATION SYSTEM (BAS).
7. PROVIDE A TEMPERATURE SENSOR FOR ALL ELECTRICAL AND TELECOM ROOMS. MONITOR TEMPERATURE AT THE BAS; SHOULD TEMPERATURE RISE ABOVE SETPOINT (ADJUSTABLE), ALARM AT THE BAS.
8. ALL SETPOINTS INDICATED ON THE SEQUENCES SHALL BE ADJUSTABLE.
9. ALL ATC WIRING SHALL BE INSTALLED IN CONDUIT.
10. REFER TO SPECIFICATIONS FOR FUNCTIONAL PERFORMANCE TEST VERIFICATION REQUIREMENTS.
11. 10 KVA INVERTER SYSTEM: ATC CONTRACTOR SHALL COORDINATE WITH ELECTRICAL DIVISION TO INTEGRATE "10 KVA INVERTER" WITH EXISTING CAMPUS BAS. ALL ALARMS SHALL BE MONITORED AND ENUNCIATED AT THE BAS USER STATION.

SPLIT SYSTEM HEAT PUMP AIR CONDITIONER CONTROL

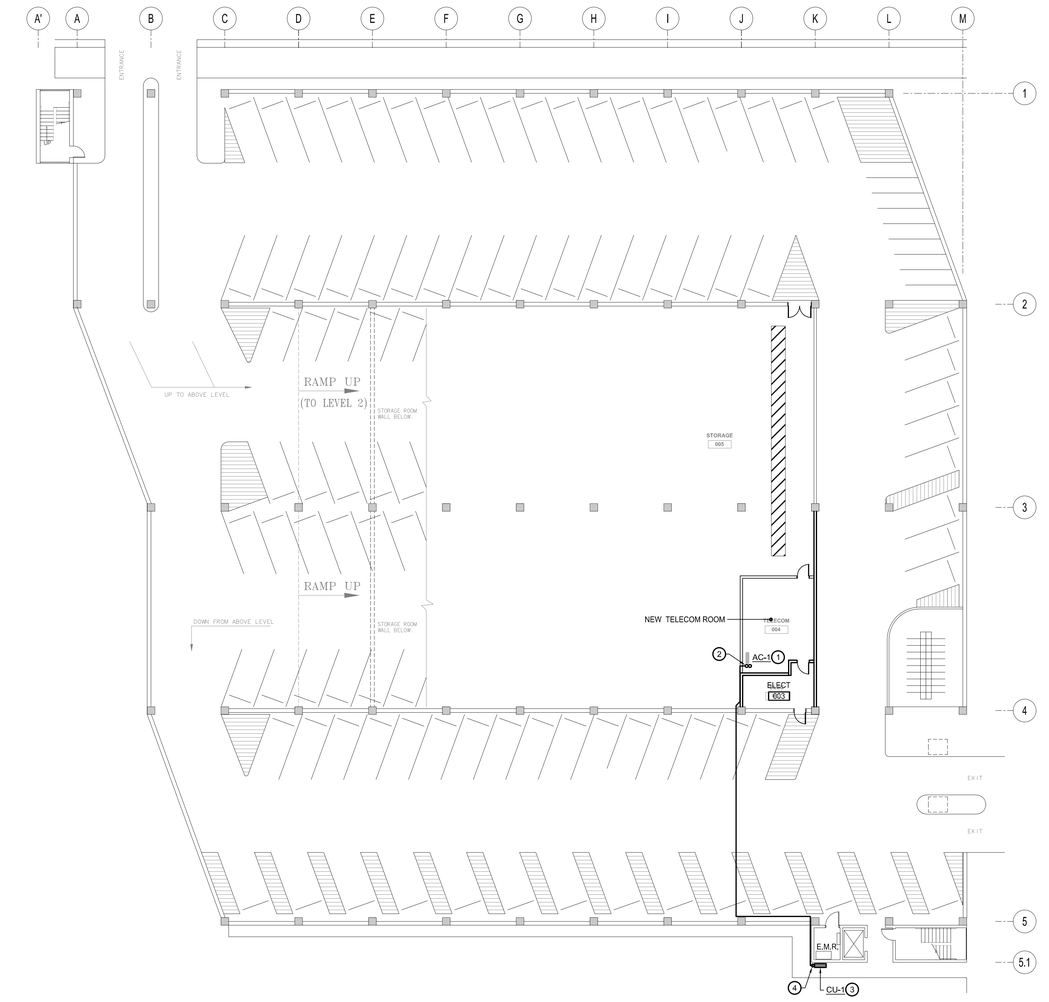
A. LOCAL THERMOSTAT SHALL CONTROL THE ELECTRICAL CLOSET AIR CONDITIONER (A/C UNIT) TO MAINTAIN A SPACE TEMPERATURE OF 72°F (ADJUSTABLE).

B. LOCAL THERMOSTAT SHALL ALARM AT THE BAS WHEN SPACE TEMPERATURE RISES ABOVE 80°F (ADJUSTABLE).

C. CONTROLS CONTRACTOR SHALL PROVIDE COLOR GRAPHICS AND TRENDING OF THE ELECTRICAL CLOSET A/C UNIT AT THE BAS.

D. CONTROLS CONTRACTORS SHALL PROVIDE A/C UNIT STATUS, ALARM AND SPACE TEMPERATURE AT THE BAS.

E. CONTROLS CONTRACTOR SHALL PROVIDE LEAK DETECTION ALARM AT THE BAS. REFER TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.



1 **EAST GARAGE (EG) MECHANICAL - NEW WORK**
SCALE: 1/16" = 1'-0"

DRAWING NOTES:

1. INDOOR SPLIT AIR CONDITIONING UNIT AC-1 MOUNTED ON WALL. CONTRACTOR SHALL PROVIDE ASPEN MINI LIME CONDENSATE PUMP WITH INDOOR UNIT. PROVIDE CONDENSATE PUMP WITH LINE KIT. EXTEND 1 1/2" CONDENSATE PIPING TO NEAREST STORM WATER RISER.
2. REFRIGERANT PIPING TO AC-1 AND CU-1. PROVIDE SIZE AND QUANTITY OF REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.
3. WALL MOUNT NEW SPLIT SYSTEM CONDENSING UNIT CU-1 ABOVE EXISTING CONDENSING UNIT.
4. REFRIGERANT PIPING TO INDOOR UNITS. PROVIDE SIZE AND QUANTITY OF REFRIGERANT PIPING PER THE MANUFACTURERS RECOMMENDATIONS. EXPOSED REFRIGERANT PIPING SHALL BE INSULATED AND PROVIDED WITH ALUMINUM METAL JACKET. REFRIGERANT PIPING SHALL BE LABELED PER THE PROJECT SPECIFICATIONS.

N

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

bkm
Burdette, Koehler, Murphy & Associates, Inc.
Mechanical / Electrical Engineers
6300 Blair Hill Lane, Suite 400
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PROJECT NAME:

Montgomery College

MONTGOMERY COLLEGE

Central Administration
Office of Facilities
40 W Gude Drive, Suite 200
Rockville, MD 20850
Telephone: 240-567-7363

EAST GARAGE FIRE ALARM UPGRADE PHASE No.3 at Montgomery College Takoma Park Campus

SEAL:

PROFESSIONAL CERTIFICATION:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. _____. EXPIRATION DATE: _____.

ISSUED FOR:

DATE	DESCRIPTION
2/25/22	95% CD SUBMISSION
11/18/22	95% CD RESUBMISSION
3/17/23	100% CD SUBMISSION
3/29/24	100% FOR CONSTRUCTION
12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

LEVEL 1 PLAN MECHANICAL - NEW WORK

DRAWING NO:

M1.01

BKM: 13058.06

Plotted By: Ron Boutiste | 12/18/2025 10:06 AM
ARL: G:\13058.06\Drawings\Acad\M\EG M1.01 L1 Flr HVAC N

ELECTRICAL LEGEND & ABBREVIATIONS

REMOVE ITEM AS NOTED	PROVIDE ITEM AS NOTED	DESCRIPTION
	(#)	ELECTRICAL DRAWING NOTE (APPLIES TO THIS DRAWING ONLY)
	#	IT DRAWING NOTE (APPLIES TO THIS DRAWING ONLY)
		DETAIL, SECTION OR ELEVATION NUMBER DRAWING NUMBER
		REVISION NUMBER - CLOUDED AREA ON DRAWING CONTAINS REVISION
		RACEWAY - 2 #12, 1 #12 GW IN 3/4" CONDUIT, U.O.N.
	(E)	HOMERUN TO PANELBOARD - ARROWS INDICATE NUMBER OF CIRCUITS SLASHES INDICATE CIRCUIT CONDUCTORS NO SLASH INDICATES TWO CIRCUIT CONDUCTORS PROVIDE GROUNDING CONDUCTOR, NOT SHOWN SHARING OF NEUTRALS IS PROHIBITED, U.O.N. SUB-LETTER 'E' INDICATES CONNECTED TO EMERGENCY POWER.
		CONDUIT TURNING UP
		CONDUIT TURNING DOWN
J	J	JUNCTION BOX: CEILING, WALL OR FLUSH-FLOOR MOUNTED
	E	TWIST LOCK NEMA TYPE 'L5-20' SPECIAL RECEPTACLE, RED IN COLOR, MOUNTED 18" A.F.F. U.O.N. SUB-LETTER 'E' INDICATES CONNECTED TO EMERGENCY POWER.
		DUPLEX RECEPTACLE - 2P, 3W, 20A, 125V, NEMA 5-20R IN RECESSED OUTLET BOX, 18" A.F.F., U.O.N.
		PANELBOARD, RECESSED OR SURFACE MOUNTED
	15	SHARED FIRE ALARM / MASS NOTIFICATION VISUAL DEVICE WITH "ALERT" INSCRIPTION, SUBSCRIPT DENOTES CANDELA RATING, 80" A.F.F. OR 6" BELOW CEILING, WHICHEVER IS LOWER. SUBSCRIPT DENOTES CANDELA RATING & TYPE: CLG - CEILING MOUNTED, WP - WEATHERPROOF
	15	COMBINATION FIRE ALARM AUDIBLE DEVICE WITH SHARED VISUAL DEVICE WITH "ALERT" INSCRIPTION, 80" A.F.F. OR 6" BELOW CEILING, WHICHEVER IS LOWER. SUBSCRIPT DENOTES CANDELA RATING & TYPESS: CLG - CEILING MOUNTED, WP - WEATHERPROOF
		FIRE ALARM AUDIBLE DEVICE, 80" A.F.F. OR 6" BELOW CEILING, WHICHEVER IS LOWER.
	CLG	FIRE ALARM AUDIBLE DEVICE, CEILING MOUNTED.
B	B	FIRE ALARM BELL, WALL MOUNTED, 80" A.F.F., U.O.N.
		FIRE ALARM MANUAL STATION, 48" A.F.F., U.O.N.
		HEAT DETECTOR
		SMOKE DETECTOR
	E	SMOKE DETECTOR FOR ELEVATOR RECALL
		DUCT SMOKE DETECTOR
	H	COMBINATION SMOKE / HEAT DETECTOR
TS	TS	SPRINKLER VALVE POSITION (TAMPER) SWITCH
FS	FS	SPRINKLER FLOW SWITCH
PS	PS	SPRINKLER PRESSURE SWITCH
		FIRE ALARM MAGNETIC DOOR HOLDER
DACT	DACT	DIGITAL ALARM COMMUNICATION TRANSMITTER
FACP	FACP	FIRE ALARM CONTROL PANEL
FATC	FATC	FIRE ALARM TERMINAL CABINET
FAP	FAP	FIRE ALARM ANNUNCIATOR PANEL
NAC	NAC	FIRE ALARM NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANEL
	CM	FIRE ALARM ADDRESSABLE CONTROL MODULE
	IM	FIRE ALARM ISOLATOR MODULE
	MM	FIRE ALARM ADDRESSABLE MONITORING MODULE
RI	RI	FIRE ALARM SYSTEM DUCT DETECTOR REMOTE INDICATOR.
RT	RT	FIRE ALARM SYSTEM DUCT DETECTOR REMOTE TEST SWITCH WITH INDICATOR.
CCTV	CCTV	SECURITY CAMERA. (CAMERA PROVIDED AT A LATER DATE UNDER A SEPARATE PROJECT).
	TRAY	EXPOSED CABLE TRAY SUSPENDED FROM CEILING
		COMBINATION TELEPHONE/DATA OUTLET. PROVIDE EMPTY JUNCTION BOX WITH SINGLE GANG EXTENSION WITH 1" CONDUIT FROM BOX TO ACCESSIBLE CEILING SPACE WITH PULL STRING. CABLE, JACKS AND FACEPLATES PROVIDED BY OTHERS.
EC		EMERGENCY CALL STATION
		EXISTING BLUE LIGHT - REMOVE
		EXISTING DATA RACK
		EXISTING DATA RACK WITH NEW PATCH PANEL(S)
CR	CR	CARD READER
REX	REX	REQUEST TO EXIT - REFER TO DIVISION 08 DOOR HARDWARE
ES	ES	ELECTRIC STRIKE - REFER TO DIVISION 08 DOOR HARDWARE
DC	DC	DOOR CONTACT

A	AMPERE
AC	ALTERNATING CURRENT
AFC	ABOVE FINISHED COUNTER
AFF	ABOVE FINISHED FLOOR
AIC	AMPERE INTERRUPTING CAPACITY
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CX	CONNECT TO EXISTING
DWG	DRAWING
ELEC	ELECTRIC / ELECTRICAL
EMER	EMERGENCY
EMR	ELEVATOR MACHINE ROOM
ETR	EXISTING TO REMAIN
EX	EXISTING
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FAAP	FIRE ALARM ANNUNCIATOR PANEL
F	FUSED OR FUSIBLE
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GW	GROUND WIRE
GND	GROUND
HP	HORSEPOWER
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT-AMPERE
KW	KILOWATT
MCB	MAIN CIRCUIT BREAKER
MECH	MECHANICAL
MLO	MAIN LUGS ONLY
MTD	MOUNTED
PH or Ø	PHASE
P	POLE
RX	REMOVE EXISTING
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLT
VPS	VALVE POSITION (TAMPER) SWITCH
W	WIRE
WP	WEATHERPROOF
XFMR	TRANSFORMER

NOTE: SOME SYMBOLS & ABBREVIATIONS MAY NOT BE USED ON THIS PROJECT.

ELECTRICAL GENERAL NOTES:

1. EXISTING CONDITIONS INFORMATION WAS OBTAINED FROM RECORD DRAWINGS AND LIMITED NON-INVASIVE SIZE INVESTIGATION. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK.
2. ELECTRICAL EQUIPMENT SHOWN WITH SOLID LIGHT LINES SHALL REMAIN ALONG WITH ASSOCIATED WORK UNLESS OTHERWISE NOTED. ELECTRICAL EQUIPMENT SHOWN WITH DARK DASHED LINES SHALL BE REMOVED BACK TO NEAREST REMAINING POINT OF USAGE UNLESS OTHERWISE NOTED.
3. ALL EQUIPMENT REMOVED AND NOT RETAINED BY THE OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE OWNER'S SITE AS EXPEDITIOUSLY AS POSSIBLE. OWNER SHALL CLARIFY / QUANTIFY ITEMS TO BE RETAINED. CONTRACTOR SHALL COORDINATE WITH OWNER.
4. CONTRACTOR SHALL REMOVE AND REINSTALL EXISTING LAY-IN CEILING SYSTEMS AS REQUIRED TO INSTALL CONDUIT AND WIRING OR CABLING SERVING FIRE ALARM, MASS NOTIFICATION AND SECURITY SYSTEM EQUIPMENT AND DEVICES. ANY CEILING SYSTEM COMPONENTS DAMAGED DURING REMOVAL AND REINSTALLATION SHALL BE REPLACED WITH MATERIALS TO MATCH EXISTING AT THE CONTRACTOR'S EXPENSE.
5. ALL WORK IS TO BE DONE IN A THOROUGH AND PROFESSIONAL MANNER AND WILL BE SUBJECT TO INSPECTION AND ACCEPTANCE. WORK THAT IS DEEMED SUB-STANDARD WILL BE SUBJECT TO REPLACEMENT OR REPAIR AT NO ADDITIONAL COST TO THE OWNER.
6. CAREFULLY EXAMINE THE PREMISES TO DETERMINE THE EXTENT OF WORK AND THE CONDITION UNDER WHICH IT MUST BE DONE. SHOULD THERE BE ANY QUESTIONS REGARDING THE PROJECT, THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING CLARIFICATIONS FROM THE CONTRACTING OFFICER FOR AUTHORITY AND/OR DIRECTION BEFORE PROCEEDING WITH WORK OR RELATED WORK IN QUESTION.
7. DRAWINGS ARE SCHEMATIC IN NATURE AND ARE NOT DRAWN TO SCALE. CONTRACTOR IS RESPONSIBLE FOR COORDINATING EXACT ROUTING OF ALL SERVICES AND DISTANCES WITH EXISTING CONDITIONS AND WITH ALL OTHER TRADES.
8. ANY DISCREPANCIES BETWEEN THE PLANS AND ACTUAL FIELD CONDITIONS MUST BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE MONTGOMERY COLLEGE PROJECT MANAGER.
9. IN THE INSTALLATION OF THIS WORK, THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF LOCAL LAWS AND ORDINANCES, THE LAWS OF THE STATE, THE NATIONAL BOARD OF FIRE UNDERWRITERS, THE NATIONAL ELECTRIC CODE AND MONTGOMERY COLLEGE STANDARDS.
10. OUTAGES TO ANY SYSTEMS SHALL BE CLOSELY COORDINATED WITH OWNER'S OPERATING SCHEDULE. CONTRACTOR SHALL PROVIDE A MINIMUM OF 72 HOURS NOTICE TO OWNER FOR ANY PLANNED OUTAGE.
11. BEFORE DEMOLITION OF ANY CONDUIT OR CABLING, VERIFY ALL DEVICES AND SYSTEMS BEING SERVED OUTSIDE CONSTRUCTION AREA WILL NOT BE AFFECTED BY THIS DEMOLITION. IF ANY DEVICES ARE AFFECTED, NEW CABLING MAY BE REQUIRED. VERIFY WITH OWNER OR DEPARTMENT SUPERVISOR BEFORE DISRUPTING ANY SERVICES AFFECTED OUTSIDE THE CONSTRUCTION AREA. ANY EXISTING DEVICES AND SYSTEMS DISRUPTED BY DEMOLITION ARE TO BE RESTORED TO OPERATION IMMEDIATELY OR WITHIN TIME AGREED UPON WITH OWNER.
12. THE CONTRACTOR SHALL USE CARE WHEN PERFORMING SELECTIVE BUILDING DEMOLITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE INCLUSIVE OF, BUT NOT LIMITED TO: BUILDING FINISHES, LIGHTING (INTERIOR & EXTERIOR), FURNITURE, CEILING SYSTEMS, STRUCTURE, MECHANICAL, PLUMBING, TELECOMMUNICATIONS & ELECTRICAL EQUIPMENT / SYSTEMS. SHOULD ANY DAMAGE OCCUR OR SHOULD ANY REMEDIAL WORK BE REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR AND / OR REPLACE THE DAMAGED ITEM(S) TO THE OWNERS SATISFACTION AT NO ADDITIONAL COST.
13. EXISTING DEVICES TO REMAIN OR TO BE REUSED ARE TO BE THOROUGHLY CLEANED AND TESTED FOR PROPER OPERATION.
14. EXISTING CONDUITS TO BE REUSED ARE TO BE CLEANED OUT BEFORE INSTALLATION OF NEW CABLING.
15. EXISTING FIRE ALARM SYSTEMS SHALL REMAIN OPERATIONAL DURING CONSTRUCTION AND SHALL BE REMOVED AFTER REPLACEMENT FIRE ALARM SYSTEM IS INSTALLED, TESTED AND ACCEPTED BY AUTHORITY HAVING JURISDICTION.
16. PROVIDE METAL DEVICE PLATE WHERE RECESSED FIRE ALARM DEVICES ARE BEING REMOVED. PAINT TO MATCH ADJACENT SURFACE.
17. ALL COMPONENTS OF EXISTING FIRE ALARM SYSTEMS INCLUDING WIRING, CONDUIT & DEVICES (PULL STATIONS, SIGNAL, ETC.) SHALL REMAIN IN OPERATION DURING INSTALLATION OF NEW FIRE ALARM / MASS NOTIFICATION SYSTEM. PROVIDE TEMPORARY SUPPORT & PROTECTION AS REQUIRED DURING CONSTRUCTION.
18. ANY WALLS AND / OR CEILING DAMAGED DURING INSTALLATION OF FIRE ALARM, MASS NOTIFICATION AND SECURITY SYSTEM EQUIPMENT AND DEVICES SHALL BE PATCHED AND FINISHED TO MATCH ADJACENT SURFACES.
19. ALL SYSTEMS WIRING TO BE INSTALLED IN CONDUIT.
20. CONTRACTOR SHALL PROVIDE IMC RACEWAY IN SIZES AS REQUIRED TO ACCOMMODATE WIRING. IMC RACEWAY SHALL BE PAINTED TO MATCH SURFACE BEING MOUNTED ON AND SHALL BE RUN TO CONCEAL FROM VIEW AS MUCH AS POSSIBLE.
21. AUDIBLE / VISUAL DEVICES BEING INSTALLED ON EXTERIOR OF BUILDING SHALL BE MOUNTED AT HEIGHT WHERE CONDUIT PENETRATION THROUGH WALL WILL BE LOCATED WITHIN CEILING SPACE ON INTERIOR OF BUILDING (WHERE POSSIBLE).
22. ALL WORK ASSOCIATED WITH FIRE ALARM AND MASS NOTIFICATION SYSTEMS SHALL BE CLOSELY COORDINATED WITH DAVE LEWIS OF JOHNSON CONTROLS AT 240-786-2894.
23. CONTRACTOR SHALL COORDINATE ALL TELECOM WORK WITH MONTGOMERY COLLEGE PROJECT MANAGER.
24. CONTRACTOR SHALL COORDINATE ALL LAY DOWN AREAS WITH MONTGOMERY COLLEGE PROJECT MANAGER.
25. COORDINATE LOCATION AND MOUNTING REQUIREMENTS OF ALL CEILING-MOUNTED OR ABOVE-CEILING-MOUNTED DEVICES WITH EXISTING LIGHTING LAYOUT, AND OTHER CEILING OR ABOVE-CEILING MOUNTED EQUIPMENT.
26. CONDUITS ARE TO HAVE A MAXIMUM 40% FILL RATIO.
27. ALL PENETRATED STRUCTURES ARE TO BE RETURNED TO ORIGINAL CONDITION AND FIRE / SMOKE RATING.
28. THE CONTRACTOR IS REQUIRED TO PROPERLY FIRE-STOP ALL CONDUIT AND CABLE WALL PENETRATIONS USED AS PART OF THIS PROJECT WITH APPROVED FIRE-STOPPING COMPOUND AND IN ACCORDANCE WITH LOCAL AND NATIONAL CODES. INSTALLATION OF FIRE-STOPS SHALL BE PERFORMED BY AN APPLICATOR/INSTALLER QUALIFIED AND TRAINED BY THE MANUFACTURER. INSTALLATION SHALL BE PERFORMED IN STRICT ACCORDANCE WITH MANUFACTURERS' DETAILED INSTALLATION PROCEDURES.
29. NEW CIRCUIT BREAKERS BEING INSTALLED WITHIN EXISTING PANELS AND LOAD CENTERS SHALL BE TYPES TO MATCH EXISTING AND MAINTAIN MINIMUM AIC RATING OF PANEL AND LOAD CENTER.
30. CONTRACTOR SHALL UPDATE EXISTING PANELBOARD LEGENDS TO INDICATE ALL BRANCH CIRCUITS WHICH HAVE BEEN ADDED OR MODIFIED.
31. AFTER INSTALLATION OF NEW FIRE ALARM / MASS NOTIFICATION SYSTEM IS COMPLETED, EXISTING FIRE ALARM SYSTEM SHALL BE REMOVED IN ITS ENTIRETY INCLUSIVE OF ALL ASSOCIATED EQUIPMENT, DEVICES, CONDUIT, WIRING, BOXES, ETC. ANY OPENINGS CREATED BY REMOVAL OF DEVICES, EQUIPMENT, ETC. SHALL BE PATCHED & FINISHED TO MATCH ADJACENT SURFACES. PROVIDE BLANK DEVICES PLATES ON ALL RECESSED OUTLET BOXES ABANDONED IN PLACE (TYPE TO MATCH OTHER PLATES IN SAME AREA).
32. REMOVE ALL EXISTING CABLING NOT BEING REUSED. (NO UNUSED CABLING SHALL BE ABANDONED IN PLACE).
33. PAINT EXPOSED FIRE ALARM CONDUIT RED OR PROVIDE FACTORY PAINTED CONDUIT WITH RED PAINTED FINISH.
34. PROVIDE RED IMC FOR FIRE ALARM WIRING BETWEEN CONTROL PANELS & NAC / FATC PANELS (EMT IS NOT ACCEPTABLE). FIRE ALARM WIRING FROM CONTROL PANEL, NAC OR FATC TO DEVICES SHALL BE TYPE 'MC' CABLE WITH RED PAINTED FINISH.
35. REMOVE ALL EXISTING EXPOSED CONDUIT & 'MC' CABLE NOT BEING REUSED INCLUSIVE OF CONDUIT & 'MC' CABLE ABOVE ACCESSIBLE CEILINGS. CONDUIT & 'MC' CABLE LOCATED IN NON-ACCESSIBLE AREAS SHALL BE ABANDONED (REFER TO SPECIFICATION FOR PROCEDURES TO BE FOLLOWED).
36. MONTGOMERY COLLEGES ELEVATOR CONTRACTOR IS DISTRICT ELEVATORS (410-726-5227). ALL WORK ASSOCIATED WITH ELEVATOR CONTROLS SHALL BE CLOSELY COORDINATED WITH DISTRICT ELEVATOR. FINAL CONTROL WIRING CONNECTIONS TO ELEVATOR EQUIPMENT SHALL BE PERFORMED BY DISTRICT ELEVATOR. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THIS ORGANIZATION AND INCLUDING ALL ASSOCIATED COST IN THE CONTRACT BID PRICE. REFER TO SPECIFICATION SECTION 260100, 3.14 FOR ADDITIONAL INFORMATION.
37. CONTRACTOR SHALL USE GPR DETECTION ON GARAGE SLABS IN ALL AREAS WHERE THEY WILL BE PENETRATED WITH CONDUITS TO ENSURE REINFORCING RODS AND POST TENSION CABLES ARE NOT DAMAGED. THE GENERAL CONTRACTOR MUST HIRE A QUALIFIED, LICENSED, THIRD PARTY CONTRACTOR WITH AT LEAST 10 YEARS OF EXPERIENCE TO PROVIDE THIS SERVICE. THE LOCATION OF THE SLAB PENETRATIONS IS THE FULL RESPONSIBILITY OF THE CONTRACTOR.
38. CONTRACTOR SHALL TRACE EXISTING PANEL EM BRANCH CIRCUITS. PROVIDE A NEW TYPED PANEL DIRECTORY BASED ON CIRCUIT TRACING RESULTS. ALL CIRCUIT BREAKERS DETERMINED TO BE SPARE SHALL BE TURNED OFF.

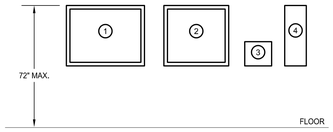
LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LENS/ LOUVER	MOUNTING	VOLTS	LAMP DATA NO.	LAMP DATA WATTS	LAMP DATA CODE	MANUFACTURER & CATALOG NO.	NOTES
A	LED STRIP LIGHTING FIXTURE	ACRYLIC	CC	MVOLT	-	39	LED 35 K	LITHONIA #ZL1F-L48-SMR-4500LM-MDD-MVOLT-35K -80CRI	
	L.E.D. EXIT LIGHT WITH WHITE THERMO-PLASTIC HOUSING	N/A	CS	MVOLT	-	1	LED	LITHONIA #EXRG M6	1

MOUNTING: CS - CEILING, SURFACE; CR - CEILING, RECESSED, ACT; CC# - CEILING, SUSPENDED, # FEET A.F.F.; CG - CEILING, RECESSED, GYPSUM BD.; WS# - WALL MTD., SURFACE, # FEET A.F.F.; WR# - WALL, RECESSED, # FEET A.F.F.

LIGHTING FIXTURE NOTES:

1. PROVIDE MOUNTING TYPES, DIRECTIONAL ARROWS AND FACE QUANTITIES (SINGLE / DOUBLE) AS INDICATED ON DRAWING. COORDINATE LETTER COLOR WITH AUTHORITY HAVING JURISDICTION.

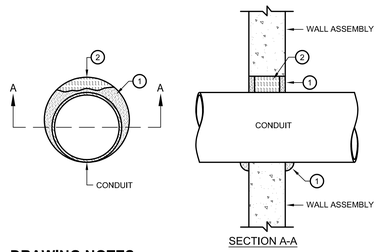


TYPICAL FIRE ALARM ANNUNCIATOR LAYOUT

NO SCALE

DRAWING NOTES:

1. FIRE ALARM ANNUNCIATOR PANEL. INDICATE LOCATION OF FACP ON ANNUNCIATOR PANEL. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. CABINET WITH MICROPHONE & ZONE SELECTION CONTROLS. PROVIDE FOLLOWING SPEAKER ZONES: STAIRWAYS, ELEVATOR CABS, EACH FLOOR & 'ALL CALL'.
3. 'KNOX-VAULT' MANUFACTURED BY KNOX COMPANY, SERIES 4400 WITH TWO (2) DOUBLE ACTION ROTATING TUMBLERS. PROVIDE WITH BLACK FINISH & SURFACE BOX. PROVIDE MONITORING MODULE CONNECTED TO FIRE ALARM TO MONITOR STATUS OF SECURITY CONTACTS. COORDINATE FINAL LOCATION WITH OWNER.
4. DOCUMENT BOX FOR AS-BUILT DRAWINGS. COORDINATE FINAL LOCATION WITH OWNER.



SECTION A-A

DRAWING NOTES:

1. FILL,VOID OR CAVITY MATERIALS* - SEALANT MIN 1/4" THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/2" DIAM. BEAD OF SEALANT APPLIED TO THE PENETRANT / CONCRETE INTERFACE AT THE POINT CONTACT LOCATION ON BOTH SURFACES OF WALL. SEALANT SHALL BE 3M COMPANY WATERTIGHT SEALANT 1003SL.
2. PACKING MATERIAL - MIN 2-1/4 IN. THICKNESS OF MIN 4 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.

CONDUIT PENETRATION THROUGH EXTERIOR WALL

SCALE: NONE

IT GENERAL NOTES:

1. THE RISER DIAGRAM AND EQUIPMENT RACK DETAILS ARE DIAGRAMMATIC ONLY AND HAVE BEEN PROVIDED TO DEPICT THE GENERAL ARRANGEMENT OF THE EQUIPMENT, EQUIPMENT RACKS, AND CABLING CONNECTIVITY. THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, DEVICES, COMPONENTS, CABLING, PATCH CORDS, EQUIPMENT RACKS AND APPURTENANCES IN SUFFICIENT QUANTITIES AND CONFIGURATIONS AS REQUIRED TO MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
2. COORDINATE WITH ALL APPLICABLE TRADES IN SUBMITTAL OF SHOP DRAWINGS AND THE INSTALLATION OF ALL SYSTEMS. ALL SHOP DRAWINGS SHALL DETAIL SPACE CONDITIONS IN ORDER TO ACCOMMODATE OTHER CONCERNED TRADES. ALL EQUIPMENT LOCATIONS ARE SUBJECT TO FINAL REVIEW BY THE OWNER AND ENGINEER.
3. PROVIDE IDENTIFICATION OF ALL EQUIPMENT CABINETS/RACKS, CONTROL PANELS, SUB-CONTROL PANELS, SYSTEM INTERFACE CABINETS, AND SIMILAR EQUIPMENT WITH 1-1/2 INCH WHITE LETTERING, ENGRAVED LAMINATED PLASTIC SIGNS SHALL BE USED FOR IDENTIFICATION AND SECURELY FASTENED IN ACCORDANCE WITH THE PROJECT REQUIREMENTS.
4. ALL WORK SHALL BE NEAT IN APPEARANCE, FREE OF ROUGH EDGES, SCRATCHES, BLEMISHES, CRACKS AND EXPOSED GAPS. ALL EQUIPMENT SHALL BE SECURED TO THE MOUNTING SURFACE, AND FASTENED WITH HARDWARE APPROVED BY THE MANUFACTURER AND CAPABLE OF SUPPORTING THE RATED LOAD. ALL CABLES WITHIN ENCLOSURES SHALL BE NEATLY ROUTED AND TIE WRAPPED AT 6 INCHES ON CENTER. ALL WIRE SPLICES SHALL BE TERMINATED ON TERMINAL STRIPS. SPLICES UTILIZING WIRE NUTS SHALL NOT BE ACCEPTABLE.
5. PROVIDE ALL EQUIPMENT CLEARANCES IN ACCORDANCE WITH NEC REQUIREMENTS. ARRANGE EQUIPMENT TO FACILITATE UNRESTRICTED ACCESS FOR MAINTENANCE AND SERVICE AROUND ALL EQUIPMENT, COMPONENTS, AND/OR CABLE TERMINATIONS.
6. ALL CONTROL EQUIPMENT MUST HAVE TRANSIENT PROTECTION TO COMPLY WITH UL 864 REQUIREMENTS. WHERE ANY CIRCUITS LEAVE THE BUILDING, ADDITIONAL TRANSIENT PROTECTION MUST BE PROVIDED FOR EACH CIRCUIT. DEVICES MUST BE UL LISTED UNDER STANDARD #497B (ISOLATED LOOP PROTECTORS). ALL EQUIPMENT CABINETS SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC, IEEE AND MANUFACTURERS REQUIREMENTS.
7. ALL PENETRATIONS OF WALL AND FLOORS SHALL BE FIRESTOPPED IN ACCORDANCE WITH THE ASTM AND NFPA. REFER TO RELATED SPECIFICATION SECTIONS FOR ADDITIONAL INFORMATION. INSTALLATION OF FIRE-STOPS SHALL BE PERFORMED BY AN APPLICATOR/INSTALLER QUALIFIED AND TRAINED BY THE MANUFACTURER. INSTALLATION SHALL BE PERFORMED IN STRICT ACCORDANCE WITH MANUFACTURER'S DETAILED INSTALLATION PROCEDURES.
8. REFER TO ALL RELATED SPECIFICATION SECTIONS AND DRAWINGS FOR ADDITIONAL INFORMATION.

bkm
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PROJECT NAME:

Montgomery College

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Central Administration
Office of Facilities
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Telephone: 240-567-7363

EAST GARAGE FIRE ALARM UPGRADE PHASE No.3 at Montgomery College Takoma Park Campus

SEAL:

PROFESSIONAL CERTIFICATION:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. _____. EXPIRATION DATE: _____.

ISSUED FOR:

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PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

ELECTRICAL LEGEND, ABBREVIATIONS, GENERAL NOTES & DETAILS

DRAWING NO:

E0.01

BKM: 13058.06

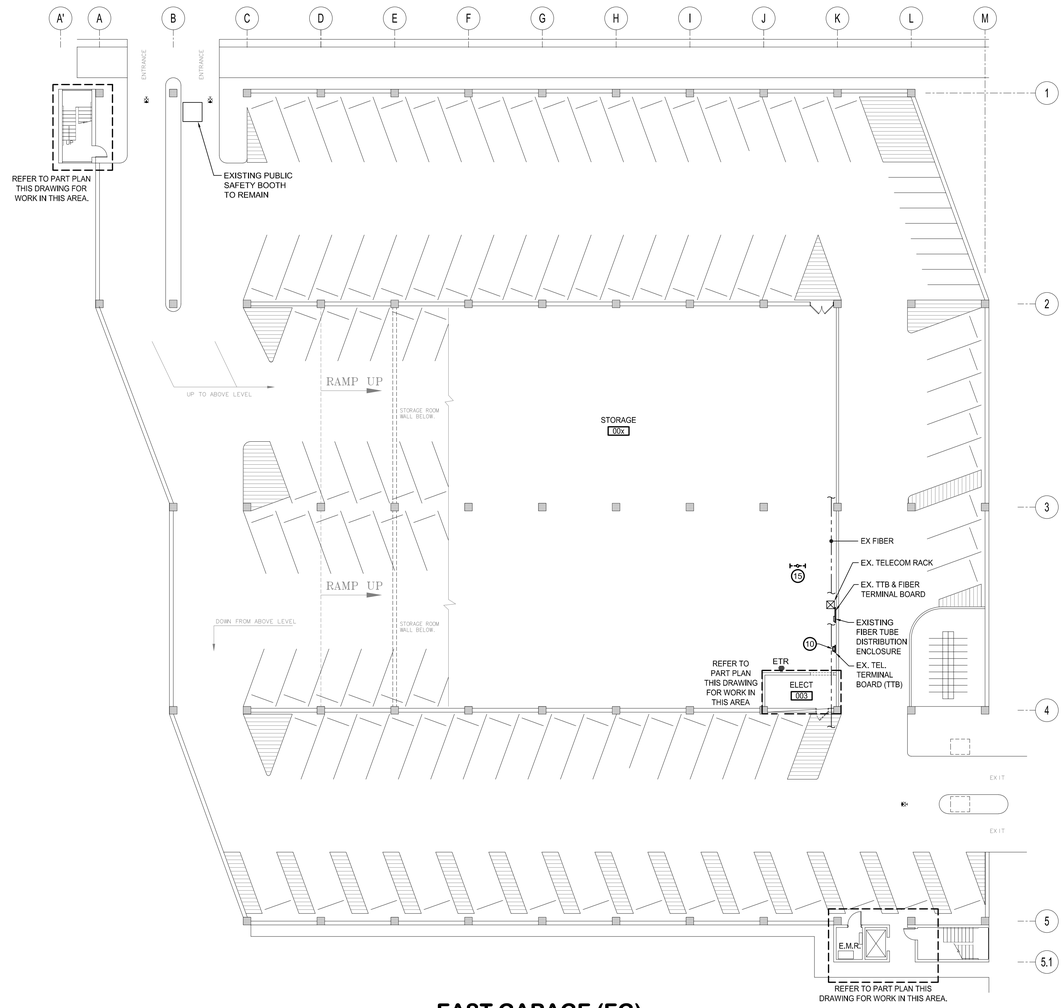
Plotted By: Ron Bautista | 12/22/2025 8:27 AM ARL: G:\13058.06\Drawings\Acad\E\E1001 LEGEND

GENERAL NOTES:

1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. ALL AREAS HAVE EXPOSED CONCRETE STRUCTURAL CEILINGS, UNLESS NOTED OTHERWISE.

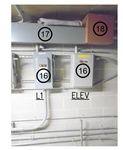
○ DRAWING NOTES:

1. C.T CABINET & METER (ETR)
2. RX FUSIBLE DISCONNECT SWITCH SERVING INVERTER.
3. ELECTRICAL PANELBOARD (ETR)
4. LIGHTING RELAY PANEL (ETR)
5. A/C UNIT (ETR)
6. RX INVERTER & EMERGENCY BATTERY CABINET.
7. PANEL ' EM ': 50 A MCB, 208 / 120 V, 3 PH, 4 W, SQUARE-D TYPE NQOB.
8. REMOVE EXISTING BATTERY & BATTERY STATUS INDICATOR PANEL INCLUSIVE OF ASSOCIATED BATTERY CABINET, BOX, CONDUIT & WIRING BACK TO SOURCE.
9. RX FIRE ALARM CONTROL PANEL.
10. REMOVE EXISTING TELEPHONE 66 BLOCK AND BUILDING ENTRANCE PROTECTION UNIT AND ALL ASSOCIATED CABLING BACK TO SOURCE.
11. SEVEN EXISTING 3/4" CONDUIT TO BE REMOVED & RELOCATED. CONTRACTOR TO EXTEND CONDUIT & WIRING TO MATCH EXISTING AS CLOSE TO CEILING STRUCTURE AS POSSIBLE.
12. RX 'KNOX-VAULT'. WALL SHALL BE PATCHED AND FINISHED TO MATCH ADJACENT SURFACES.
13. EX ELEVATOR CONTROLLER & ASSOCIATED EQUIPMENT TO REMAIN.
14. FOUR EXISTING 3/4" CONDUIT TO BE REMOVED UP TO POINT INDICATED & RELOCATED. CONTRACTOR TO EXTEND CONDUIT & WIRING TO MATCH EXISTING AS CLOSE TO CEILING STRUCTURE AS POSSIBLE.
15. EXISTING SURFACE MOUNTED LIGHTING FIXTURE TO BE REMOVED AS REQUIRED TO ACCOMMODATE NEW WALL CONSTRUCTION.
16. RX FUSIBLE DISCONNECT SWITCH.
17. RX WIRE TROUGH.
18. RX PULL BOX.
19. RX TWO 3" CONDUIT.



EAST GARAGE (EG)
1 LEVEL 1 PLAN - FIRE ALARM - DEMOLITION
SCALE: 1/16" = 1'-0"

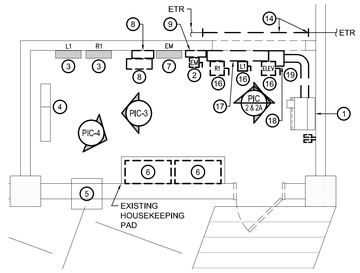
PIC-1



PIC-2 PIC-2A

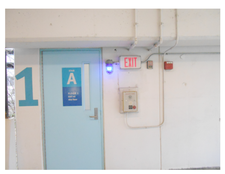
PIC-3

PIC-4



PART PLAN ELECTRICAL ROOM 003 ELECTRICAL DEMOLITION
3 SCALE: 1/4" = 1'-0"

NW CORNER EXTERIOR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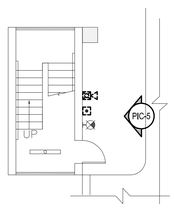
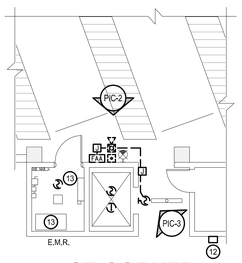


NW CORNER



SE CORNER

PIC-2

PIC-3

PIC-2A

ELEVATOR MACHINE ROOM

SE CORNER EXTERIOR

2 ENLARGED PLANS STAIRWELLS - FIRE ALARM - DEMOLITION
SCALE: 1/8" = 1'-0"

SCALE: 1/16"=1'-0" (0, 8', 16', 32', 48')

SCALE: 1/8"=1'-0" (0, 4', 8', 16', 24')

N

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PROJECT NAME:

Montgomery College

MONTGOMERY COLLEGE

Central Administration
Office of Facilities
40 W Gude Drive, Suite 200
Rockville, MD 20850
Telephone: 240-567-7363

EAST GARAGE FIRE ALARM UPGRADE PHASE No.3 at Montgomery College Takoma Park Campus

SEAL:

PROFESSIONAL CERTIFICATION:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. _____. EXPIRATION DATE: _____.

ISSUED FOR:

DATE	DESCRIPTION
2/25/22	95% CD SUBMISSION
11/18/22	95% CD RESUBMISSION
3/17/23	100% CD SUBMISSION
3/29/24	100% FOR CONSTRUCTION
12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

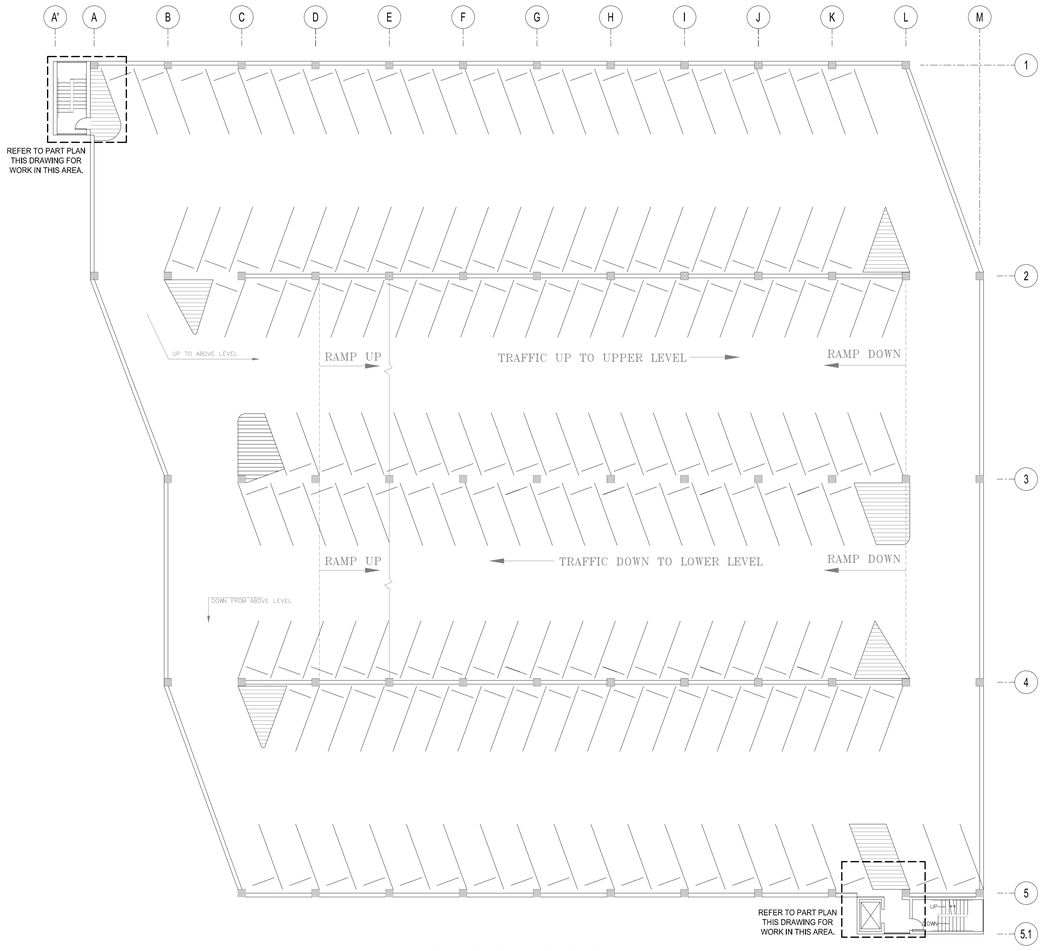
LEVEL 1 PLAN
FIRE ALARM - DEMOLITION

DRAWING NO:

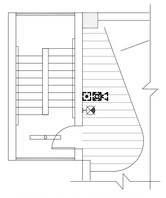
E1.01

BKM: 13058.06

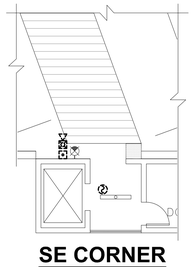
ARL: G:\13058.06\Drawings\Acad\E\EG E101 L1 Fir FA D
Plotted By: Ron Bautista | 12/22/2025 9:05 AM



EAST GARAGE (EG)
1 LEVEL 2 PLAN - FIRE ALARM - DEMOLITION
SCALE: 1/16" = 1'-0"



NW CORNER



SE CORNER

2 ENLARGED PLANS - FIRE ALARM - DEMOLITION
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. ALL AREAS HAVE EXPOSED CONCRETE STRUCTURAL CEILINGS, UNLESS NOTED OTHERWISE.

SCALE: 1/16"=1'-0"

SCALE: 1/8"=1'-0"

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12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

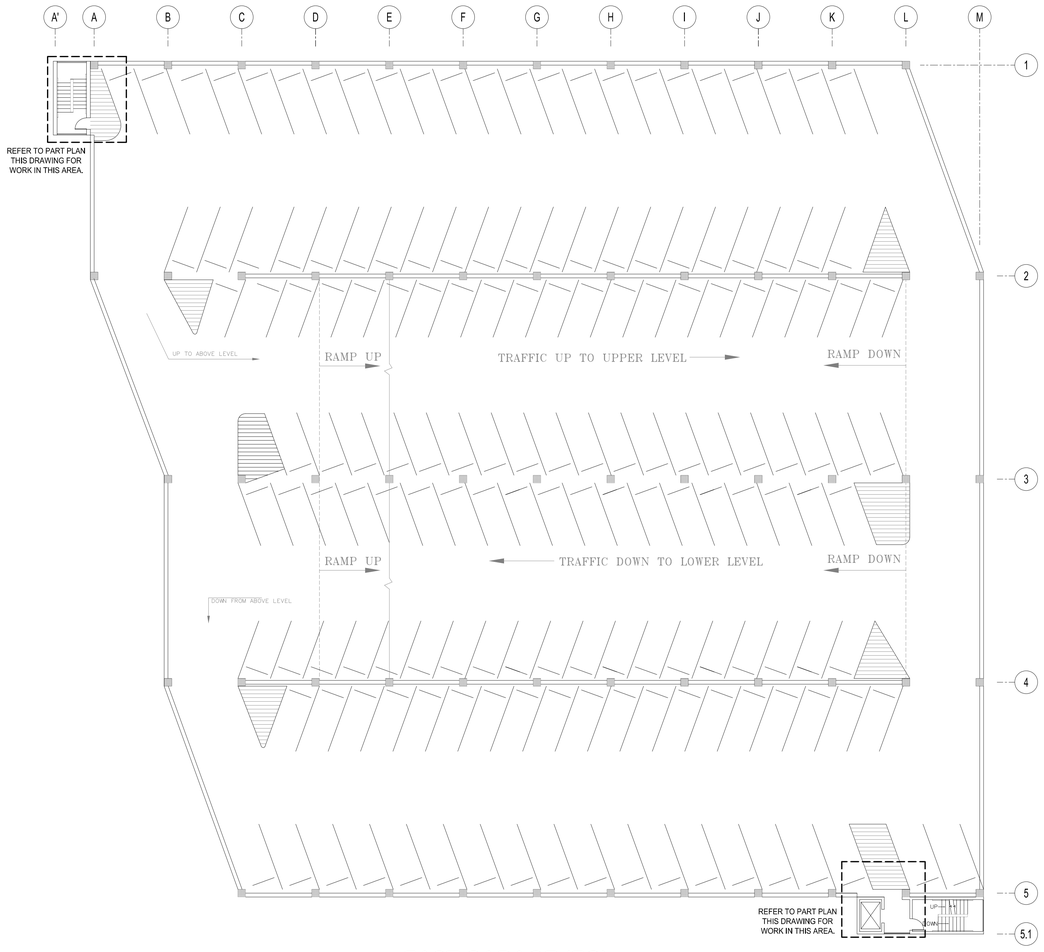
LEVEL 2 PLANS
FIRE ALARM - DEMOLITION

DRAWING NO:

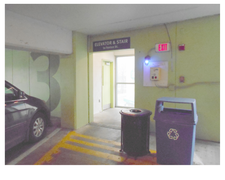
E1.02

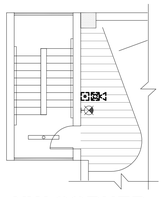
BKM: 13058.06

Plotted By: Ron Bautista | 12/18/2025 9:43 AM
ARL: G:\13058.06\Drawings\Acad\E\EG E102_L2 Flr FA D

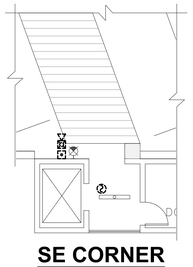


EAST GARAGE (EG)
1 LEVEL 3 PLAN - FIRE ALARM - DEMOLITION
SCALE: 1/16" = 1'-0"





NW CORNER



SE CORNER

2 ENLARGED PLANS - FIRE ALARM - DEMOLITION
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. ALL AREAS HAVE EXPOSED CONCRETE STRUCTURAL CEILINGS, UNLESS NOTED OTHERWISE.

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12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

LEVEL 3 PLANS
FIRE ALARM - DEMOLITION

DRAWING NO:

E1.03

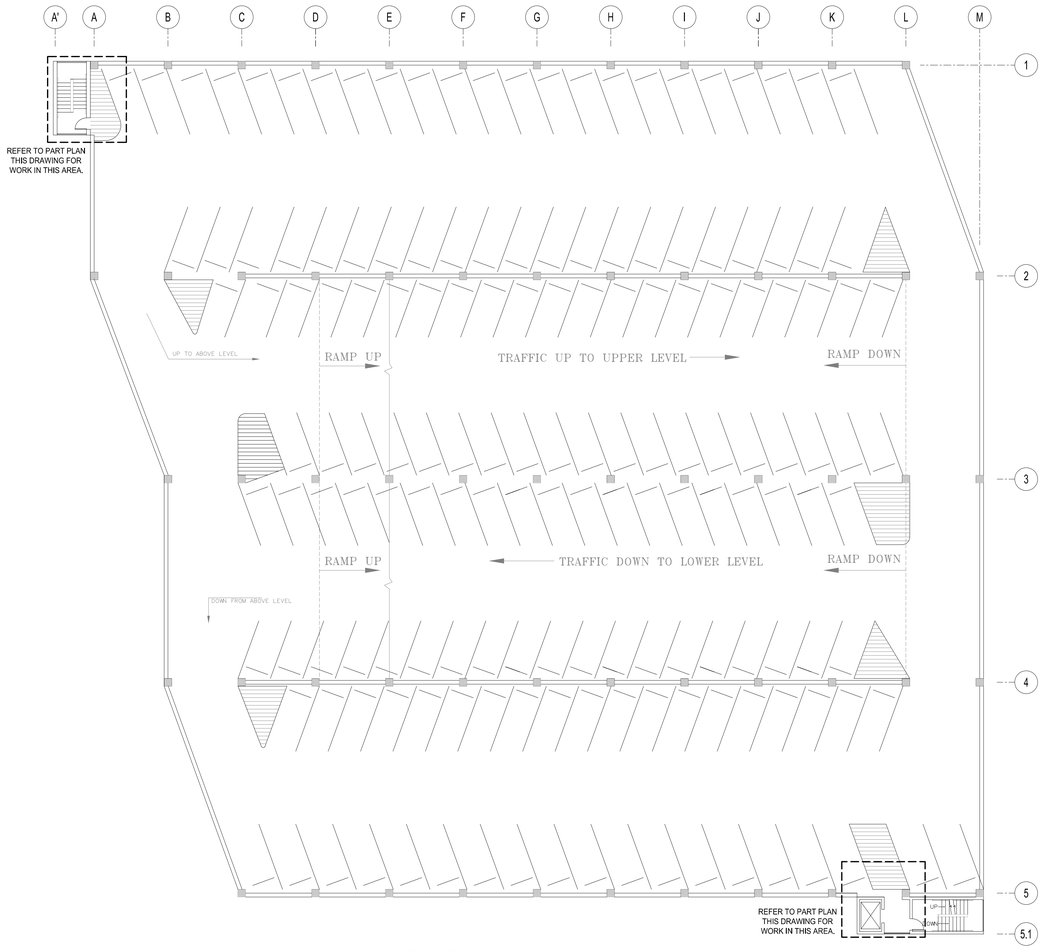
BKM: 13058.06

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

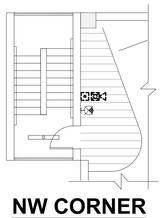
0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

N

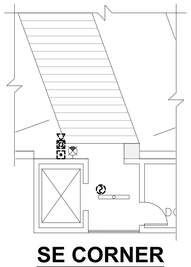
Plotted By: Ron Bautista | 12/18/2025 9:44 AM
ARL: G:\13058.06\Drawings\Acad\E\EG E103_L3 Flr FA D



EAST GARAGE (EG)
1 LEVEL 4 PLAN - FIRE ALARM - DEMOLITION
SCALE: 1/16" = 1'-0"



NW CORNER



SE CORNER

2 ENLARGED PLANS - FIRE ALARM - DEMOLITION
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. ALL AREAS HAVE EXPOSED CONCRETE STRUCTURAL CEILINGS, UNLESS NOTED OTHERWISE.

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

N

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12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

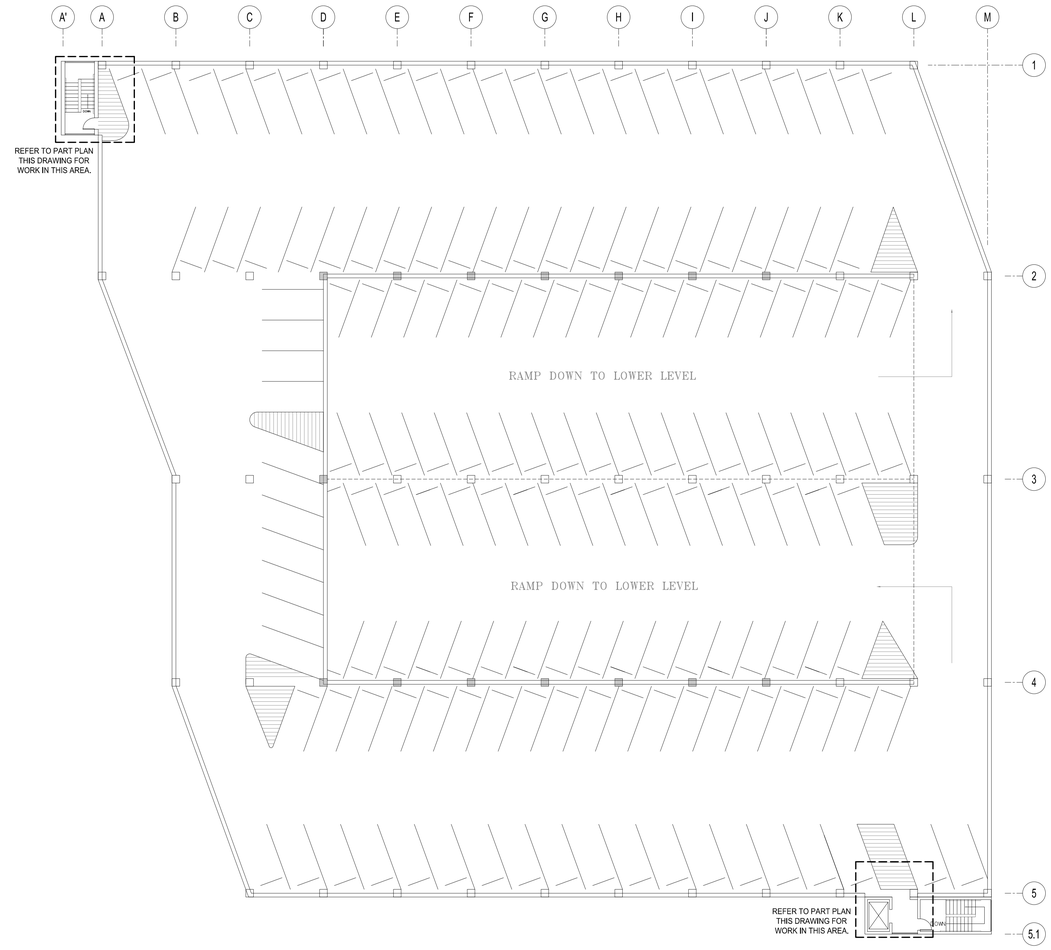
LEVEL 4 PLANS
FIRE ALARM - DEMOLITION

DRAWING NO:

E1.04

BKM: 13058.06

Plotted By: Ron Bautista | 12/18/2025 9:48 AM
ARL: G:\13058.06\Drawings\Acad\E\EG E104_L4 Flr FA D



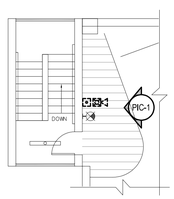
EAST GARAGE (EG)
LEVEL 5 PLAN - FIRE ALARM - DEMOLITION

1 SCALE: 1/16" = 1'-0"

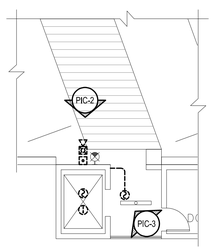
GENERAL NOTES:

1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. ALL AREAS HAVE EXPOSED CONCRETE STRUCTURAL CEILINGS, UNLESS NOTED OTHERWISE.

PIC-1



NW CORNER



SE CORNER

PIC-2

PIC-3

ENLARGED PLANS - FIRE ALARM - DEMOLITION

2 SCALE: 1/8" = 1'-0"

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

N

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3/17/23	100% CD SUBMISSION
3/29/24	100% FOR CONSTRUCTION
12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

LEVEL 5 PLANS
FIRE ALARM - DEMOLITION

DRAWING NO:

E1.05

BKM: 13058.06

Plotted By: Ron Bautista | 12/18/2025 9:51 AM
ARL: G:\13058.06\Drawings\Acad\E\EG E105 L5 Flr FA D

PIC-2

PIC-3

PIC-4

PIC-5

PIC-6

PIC-7

PIC-8

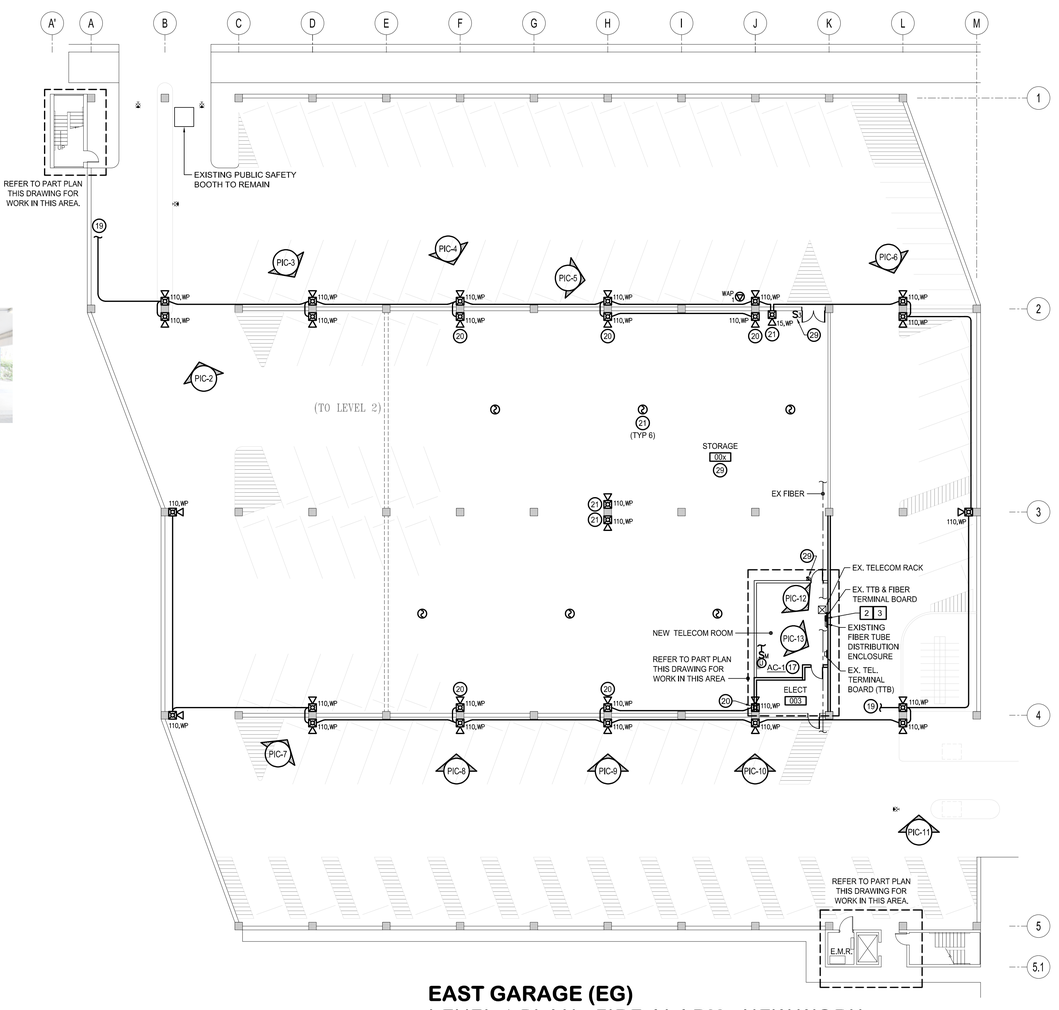
PIC-9

PIC-10

PIC-11

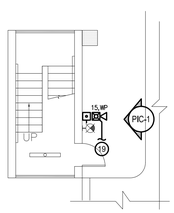
PIC-12

PIC-13

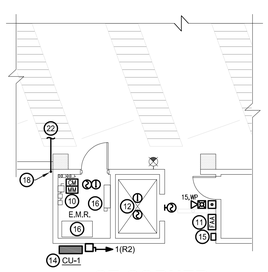


EAST GARAGE (EG)
LEVEL 1 PLAN - FIRE ALARM - NEW WORK
1 SCALE: 1/16" = 1'-0"

PIC-1



NW CORNER



SE CORNER

ELEVATOR MACHINE ROOM

SE CORNER EXTERIOR

ENLARGED STAIRWELL PLANS - FIRE ALARM - NEW WORK
2 SCALE: 1/8" = 1'-0"

☐ IT DRAWING NOTES:

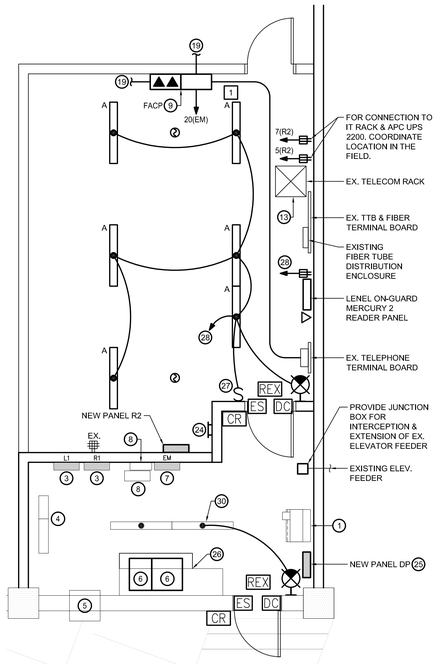
1. PROVIDE (2) CAT-6 TELEPHONE CABLES FROM NEW FACP TO EX TELEPHONE TERMINAL BOARD (TTB).
2. PROVIDE NEW 110 TERMINATION BLOCK FOR NEW TELEPHONE WALL FIELD TERMINATIONS. MOUNT ADJACENT TO EXISTING TELEPHONE BUILDING ENTRY PROTECTOR (BEP). PROVIDE CROSS CONNECTS TO PROVIDE SERVICE TO EACH TELEPHONE LINE.
3. PROVIDE NEW 110 BLOCK FOR NEW TELEPHONE LINE TERMINATIONS.

GENERAL NOTES:

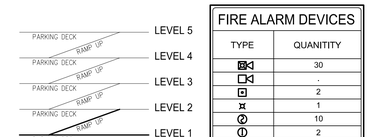
1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. ALL AREAS HAVE EXPOSED CONCRETE STRUCTURAL CEILINGS, UNLESS NOTED OTHERWISE.
3. ALL RACEWAYS RUN EXPOSED IN EAST GARAGE SHALL BE TYPE 'RGS'. WHEREVER POSSIBLE, RACEWAYS SHALL BE RUN VERTICALLY ON STAIR TOWERS (REFER TO FLOOR PLANS FOR LOCATIONS). IN LOCATIONS WHERE FLOOR SLABS MUST BE PENETRATED OR CORE DRILLED, SLAB SHALL BE X-RAYED TO ENSURE STRUCTURE IS MAINTAINED (SLABS ARE POST-TENSION CONSTRUCTION).
4. ALL BOXES UTILIZED IN UNCONDITIONED SPACES OF EAST GARAGE SHALL BE WEATHERPROOF (CAST BOXES WITH HUBS & GASKETED).
5. FIRE ALARM DEVICES INSTALLED IN UNCONDITIONED SPACES SHALL BE WEATHERPROOF TYPE WITH GASKETTING TO MAKE WATERTIGHT.
6. WHERE NEW FIRE ALARM DEVICE LOCATION INTERFERES WITH EXISTING OBSTRUCTIONS (IE, STORM WATER PIPES, SIGNS, ETC.) CONTRACTOR SHALL MOUNT FIRE ALARM DEVICE AS CLOSE TO THE BOTTOM OF OBSTRUCTION AS POSSIBLE & COORDINATE REMOVAL OR RELOCATION OF SIGNS WITH MONTGOMERY COLLEGE PROJECT MANAGER.

○ DRAWING NOTES:

1. C.T CABINET & METER (ETR)
2. DISCONNECT (ETR)
3. ELECTRICAL PANELBOARD (ETR)
4. LIGHTING RELAY PANEL (ETR)
5. A/C UNIT (ETR)
6. PROVIDE 10 KVA INVERTER SYSTEM AS MANUFACTURED BY MYERS MODEL 1-G-10-S-R90-B-E-50-01-BCF-C-T-BIP-2YWT.
7. EX. PANEL 'EM': 50 A MCB, 208 / 120 V, 3 PH, 4 W, SQUARE-D TYPE NQOB. PROVIDE (2) 20 A, 1P CIRCUIT BREAKERS (MATCH EXISTING AIC RATING) IN EX SPACE #20 & 22 TO SERVE NEW FIRE ALARM CONTROL PANEL & 'NAC' PANEL.
8. BATTERY STATUS INDICATOR PANEL (ETR - UNLESS REMOVED DURING DEMOLITION PHASE). REFER TO DRAWING NOTE 8 ON DRAWING E101 FOR ADDITIONAL INFORMATION.
9. NEW FIRE ALARM CONTROL PANEL.
10. PROVIDE (4) CONTROL MODULES (PRIMARY RECALL, SECONDARY RECALL, SHUNT-TRIP & FIRE MAN'S HAT) & (1) MONITORING MODULE (SHUNT-TRIP CIRCUIT) FOR CONNECTION TO EXISTING ELEVATOR CONTROLLER. COORDINATE LOCATIONS WITH OWNER & THEIR ELEVATOR CONTRACTOR PRIOR TO INSTALLATION. REFER TO SPECIFICATION SECTION #260100, 3.14 FOR ADDITIONAL INFORMATION.
11. FIRE ALARM REMOTE ANNUNCIATOR (ALPHA NUMERIC DISPLAY) PANEL IN SURFACE MOUNTED 'WP' PLEXI GLASS BOX WITH HINGED DOOR & SECURITY KEY LOCK. COORDINATE EXACT LOCATION WITH MONTGOMERY COLLEGE REPRESENTATIVE. COORDINATE LOCATION & PHASING WITH EXISTING REMOTE ANNUNCIATOR PANEL IN THIS AREA.
12. MOUNT IN ELEVATOR PIT.
13. PROVIDE RACK MOUNTED UPS IN TELECOM RACK. PROVIDE APC SMART UPS MODEL SRT2200RMXLA-NC. PROVIDE DATA DROP FROM PATCH PANEL TO UPS NETWORK CARD.
14. CONDENSING UNIT CU-1: 34A MCA, 50A MOCP, 208V, 1PH. PROVIDE 60A, 2P NFSS IN NEMA 3R ENCLOSURE. EXTEND 2 #6, 1 #10 GW IN 3/4" CONDUIT TO CONDENSING UNIT & CIRCUIT INDICATED. EXTEND 2 #12, 1 #12 GW IN 3/4" CONDUIT TO ASSOCIATED INDOOR UNIT.
15. 'KNOX-VAULT'
16. EX ELEVATOR CONTROLLER & ASSOCIATED EQUIPMENT TO REMAIN.
17. CONNECTION TO INDOOR UNIT AC-1: 208V, 1PH, EXTEND 2 #12, 1 #12 GW IN 3/4" CONDUIT TO ASSOCIATED OUTDOOR UNIT.
18. RUN NEW FIRE ALARM RISER UP TO FLOOR ABOVE (RUN ADJACENT TO EX BLUE PHONE RISER). SIZE FIRE ALARM CONDUIT(S) PER NEC & FIRE ALARM MANUFACTURER'S RECOMMENDATIONS.
19. TO OTHER FIRE ALARM DEVICES IN THIS AREA.
20. FIRE ALARM DEVICE LOCATED ON RAMP UP TO LEVEL 2.
21. FIRE ALARM DEVICE LOCATED IN STORAGE ROOM. PROVIDE WITH WIRE GUARD.
22. TO FACP (SEE DRAWING NOTE 9).
23. ADD SIGN INDICATING 'FIRE ALARM CONTROL PANEL' TO EXTERIOR SIDE OF DOOR INTO ELECTRICAL ROOM 003.
24. NEW 4" x 12" x 1/4" THICK COPPER GROUND BAR MOUNTED ON 2 - INCH INSULATED MOUNTING BRACKETS. MOUNT BAR 18" ABOVE FINISHED FLOOR. PROVIDE 1 #3/0 AWG INSULATED COPPER GROUND WIRE & EXTEND TO EXISTING GROUND SYSTEM SERVING THE GARAGE. COORDINATE EXACT LOCATION IN THE FIELD.
25. PROVIDE FLOOR MOUNTED KINDORF OR UNISTRUT SUPPORT UP TO CEILING STRUCTURE FOR MOUNTING OF NEW PANEL DP FLUSHED WITH CONCRETE BEAM ABOVE. PROVIDE CROSS BRACING AS REQUIRED.
26. EXTEND EXISTING CONCRETE HOUSEKEEPING PAD FOR NEW 10 KVA INVERTER, HEIGHT TO MATCH EXISTING.
27. PROVIDE LINE VOLTAGE SWITCH.
28. CONNECT TO EXISTING PANEL EM. PROVIDE 20A, 1P BRANCH CIRCUIT BREAKER IN EXISTING SPACE FOR NEW CONNECTION.
29. CONTRACTOR TO REWORK EXISTING LIGHTING CONTROL SWITCHING IN THIS ROOM. REMOVE EXISTING SWITCH AND PROVIDE TWO NEW THREE WAY SWITCH. LOCATE ONE THREE WAY SWITCH AT EACH DOOR. COORDINATE LOCATION IN THE FIELD.
30. RECONNECT NEW EXIT LIGHT TO EXISTING LIGHTING AS INDICATED.



PART PLAN
ELECTRICAL ROOM 003
ELECTRICAL - NEW WORK
3 SCALE: 1/4" = 1'-0"



PLAN ELEVATION
SCALE: NONE

FIRE ALARM DEVICES	
TYPE	QUANITITY
	30
	.
	2
	1
	10
	2
	4
	1

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

N

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EAST GARAGE FIRE ALARM UPGRADE PHASE No.3 at Montgomery College Takoma Park Campus

SEAL:

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3/17/23	100% CD SUBMISSION
3/29/24	100% FOR CONSTRUCTION
12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

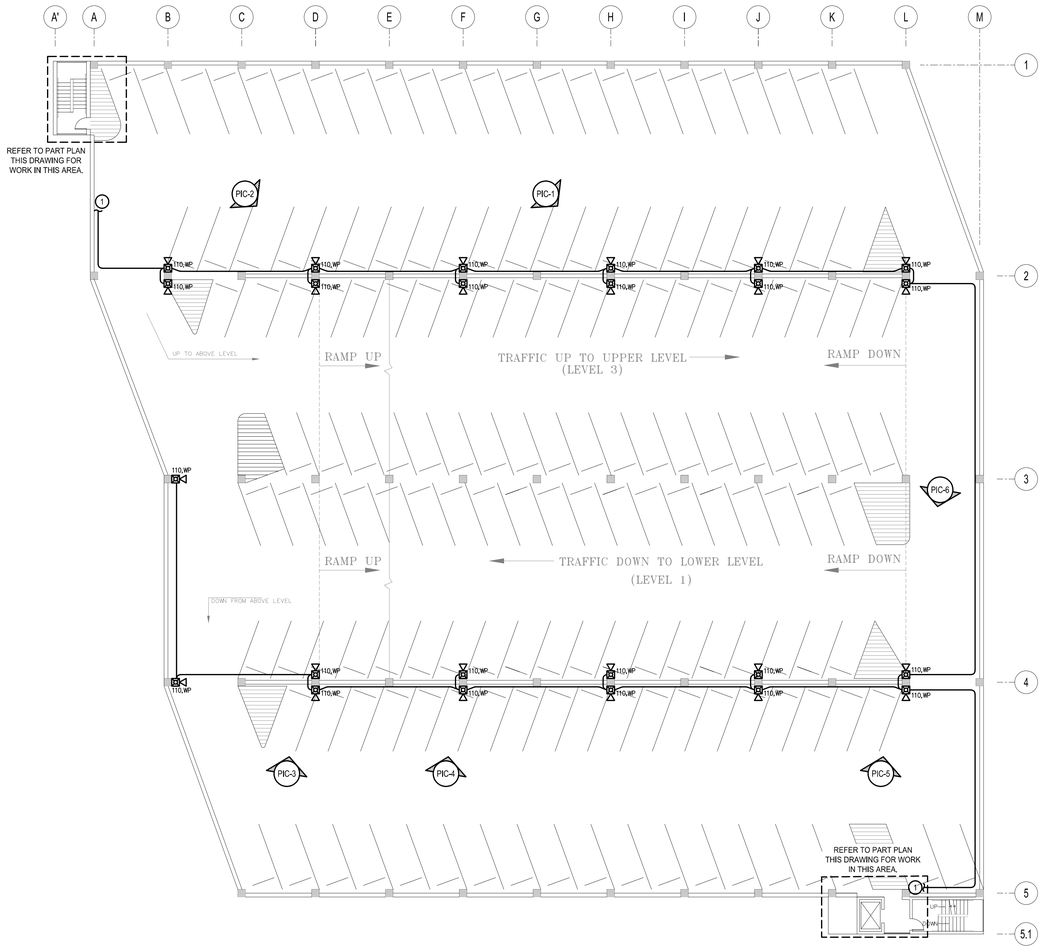
LEVEL 1 PLAN
FIRE ALARM - NEW WORK

DRAWING NO:

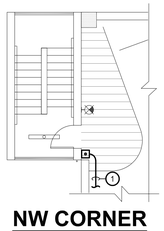
E1.06

BKM: 13058.06

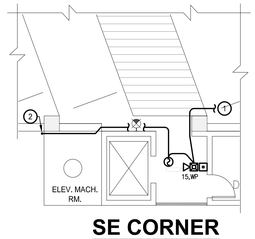
ARL: G:\13058.06\Drawings\Acad\LE\EG E106 L1 Flr FA N
Plotted By: Ron Boulosta | 12/22/2025 11:49 AM



EAST GARAGE (EG)
1 LEVEL 2 PLAN - FIRE ALARM - NEW WORK
SCALE: 1/16" = 1'-0"



NW CORNER



SE CORNER

2 ENLARGED PLANS - FIRE ALARM - NEW WORK
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO E0.01 & E2.06 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.

DRAWING NOTES:

1. TO OTHER FIRE ALARM DEVICES IN THIS AREA.
2. RUN NEW FIRE ALARM RISER DOWN TO FACP ON LEVEL 1 (RUN ADJACENT TO EX BLUE PHONE RISER). SIZE FIRE ALARM CONDUIT(S) PER NEC & FIRE ALARM MANUFACTURER'S RECOMMENDATIONS.

PIC-1

PIC-2

PIC-3

PIC-4

PIC-5

PIC-6

PLAN ELEVATION
SCALE: NONE

FIRE ALARM DEVICES	
TYPE	QUANITITY
	25
	.
	2
	.
	1
	.
CV	.
WV	.

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

N

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PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

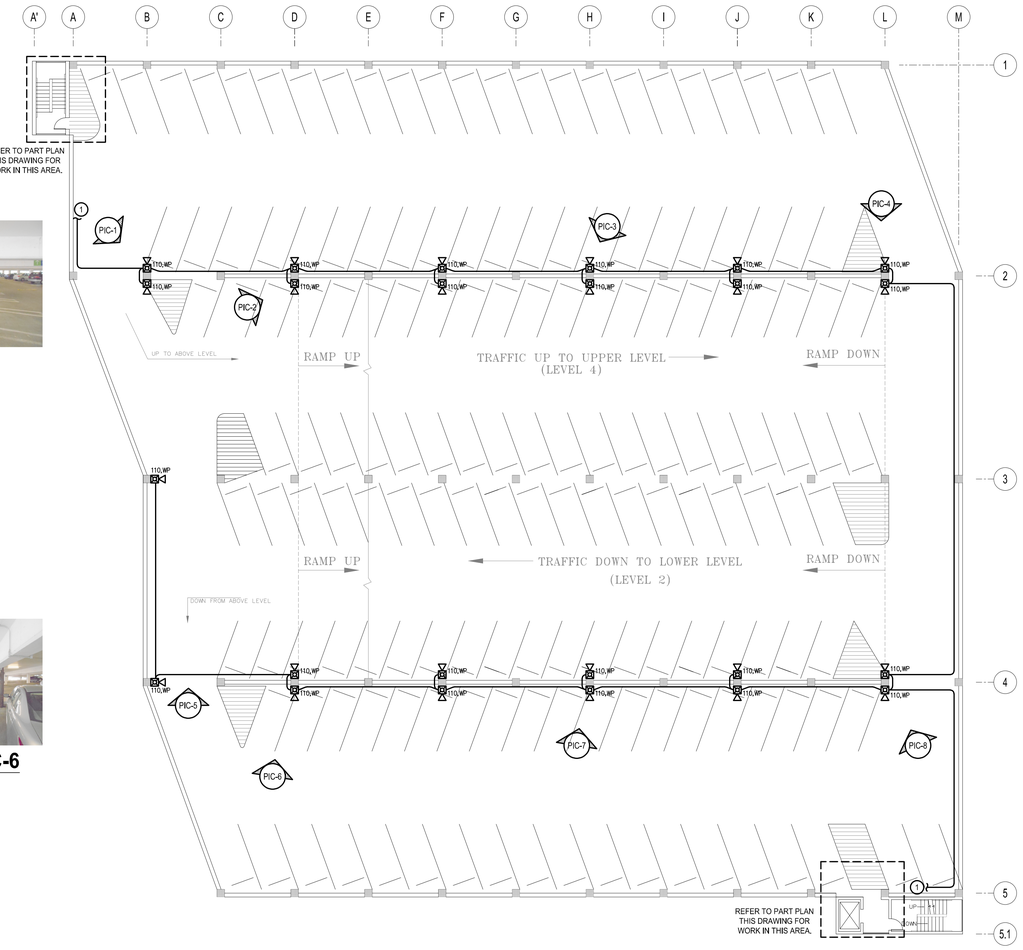
LEVEL 2 PLANS
FIRE ALARM - NEW WORK

DRAWING NO:

E1.07

BKM: 13058.06

Plotted By: Ron Bautista | 12/19/2025 10:25 AM ARL: G:\13058.06\Drawings\Acad\E\EG E107 L2 Fir FA N



EAST GARAGE (EG)
1 LEVEL 3 PLAN - FIRE ALARM - NEW WORK
SCALE: 1/16" = 1'-0"

PIC-1

PIC-2

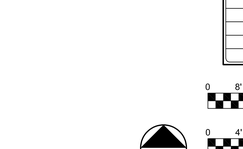
PIC-3

PIC-4

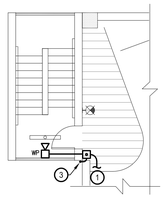
PIC-5

PIC-6

PIC-7



PIC-8



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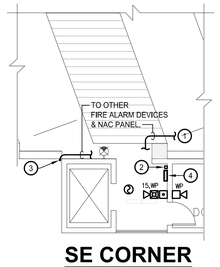

SE CORNER

2 ENLARGED PLANS - FIRE ALARM - NEW WORK
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO E0.01 & E2.06 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.

DRAWING NOTES:

1. TO OTHER FIRE ALARM DEVICES IN THIS AREA.
2. FIRE ALARM ' POWER ISOLATOR ' DEVICE. MOUNT THIS DEVICE NEXT TO 'NAC' PANEL.
3. RUN NEW FIRE ALARM RISER DOWN TO FACP ON LEVEL 1 (RUN ADJACENT TO EX BLUE PHONE RISER. SIZE FIRE ALARM CONDUIT(S) PER NEC & FIRE ALARM MANUFACTURER'S RECOMMENDATIONS.
4. 'NAC' PANEL IN 'WEATHERPROOF' HOFFMAN CABINET (NEMA-3R ENCLOSURE, WITH HINGED DOOR & SECURITY KEY LOCK). COORDINATE HOFFMAN CABINET SIZE (TO INSTALL POWER ISOLATOR IN THE SAME CABINET) & MOUNTING REQUIREMENTS WITH FIRE ALARM MANUFACTURER. CONNECT TO CIRCUIT #22(EM).

PLAN ELEVATION
SCALE: NONE

FIRE ALARM DEVICES	
TYPE	QUANITITY
	25
	2
	2
	.
	1
	.
	.
	.

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

N

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12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

LEVEL 3 PLANS
FIRE ALARM - NEW WORK

DRAWING NO:

E1.08

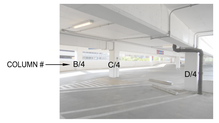
BKM: 13058.06

ARL: G:\13058.06\Drawings\Acad\E\EG E1.08_L3 Flr FA.N
Plotted By: Ron Bautista | 12/19/2025 10:26 AM

PIC-1

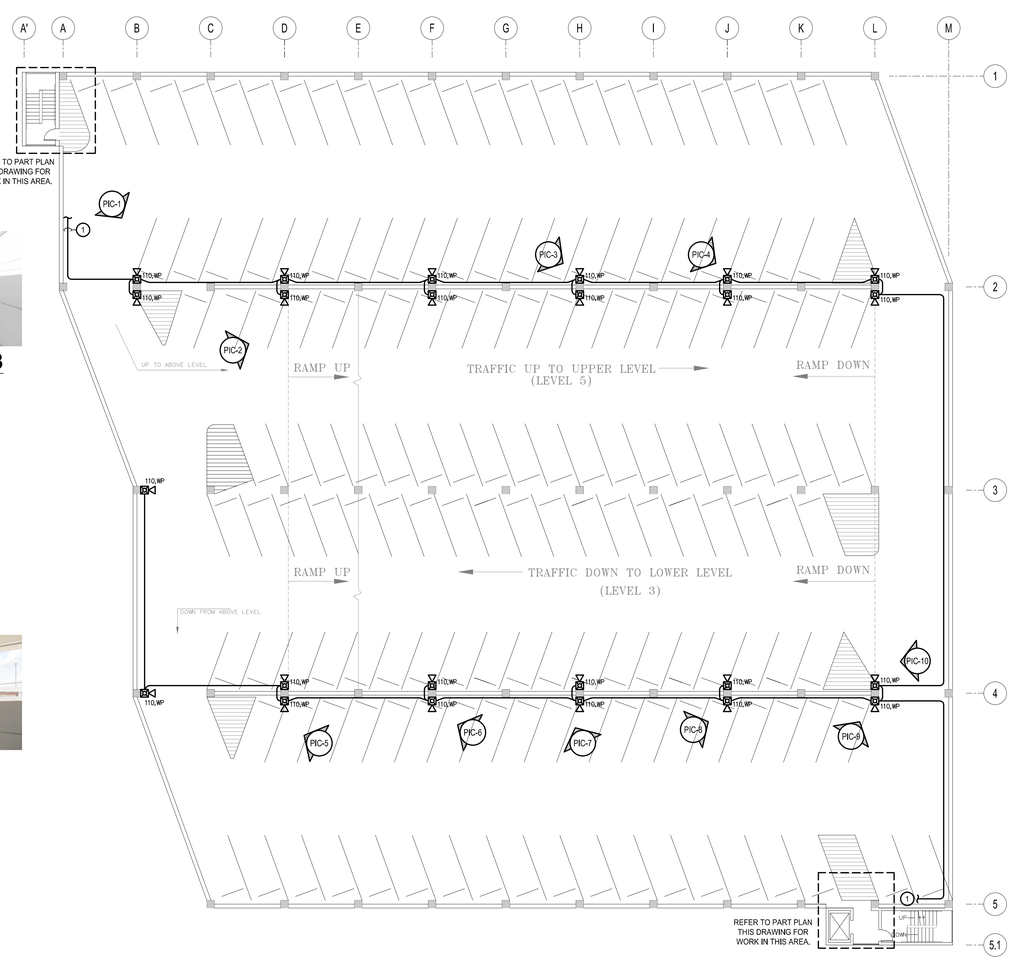
PIC-2

PIC-3

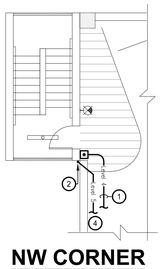


PIC-5

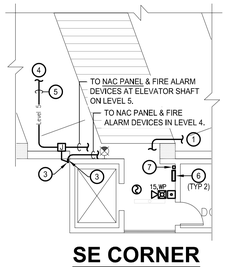
PIC-6



EAST GARAGE (EG)
1 LEVEL 4 PLAN - FIRE ALARM - NEW WORK
SCALE: 1/16" = 1'-0"



NW CORNER



SE CORNER

2 ENLARGED PLANS - FIRE ALARM - NEW WORK
SCALE: 1/8" = 1'-0"

PIC-4

PIC-7

PIC-8

PIC-9

PIC-10

PLAN ELEVATION
SCALE: NONE

FIRE ALARM DEVICES	
TYPE	QUANITITY
	25
	.
	2
	.
	1
	.
NM	.
WM	.

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

N

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12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

LEVEL 4 PLANS
FIRE ALARM - NEW WORK

DRAWING NO:

E1.09

BKM: 13058.06

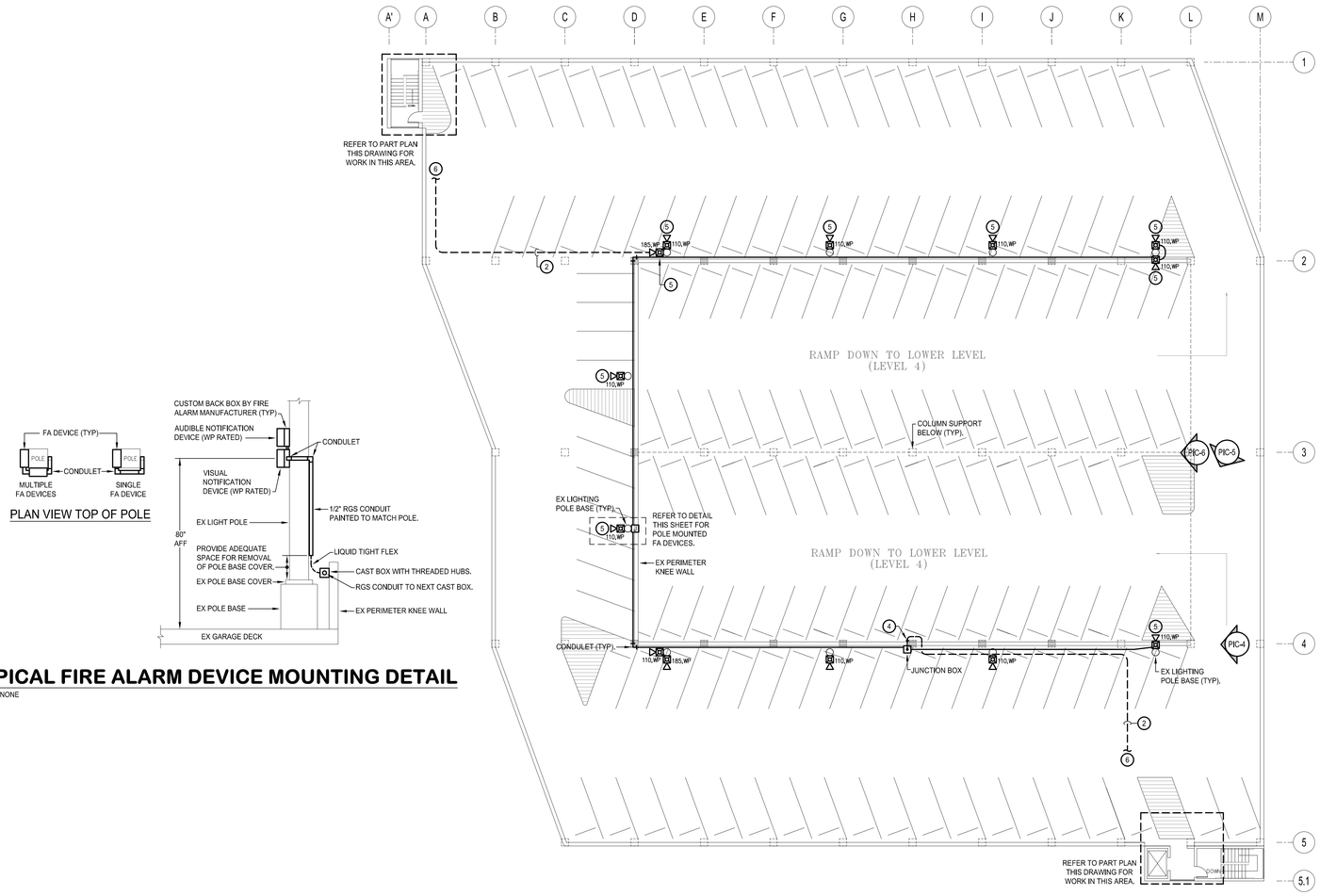
GENERAL NOTES:

1. REFER TO E0.01 & E2.06 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.

DRAWING NOTES:

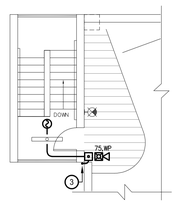
1. TO OTHER FIRE ALARM DEVICES IN THIS AREA.
2. FIRE ALARM CONDUIT TURNING UP TO FIRE ALARM DEVICE ON LEVEL 5, NE STAIRS.
3. RUN NEW FIRE ALARM RISER DOWN TO FACP ON LEVEL 1 (RUN ADJACENT TO EX BLUE PHONE RISER. SIZE FIRE ALARM CONDUIT(S) PER NEC & FIRE ALARM MANUFACTURER'S RECOMMENDATIONS.
4. REFER TO DRAWING E1.10 FOR CONTINUATION.
5. FIRE ALARM RISER SERVING LEVEL 5.
6. (2) 'NAC' PANELS IN 'WEATHERPROOF' HOFFMAN CABINET (NEMA-3R ENCLOSURE, WITH HINGED DOOR & SECURITY KEY LOCK). COORDINATE HOFFMAN CABINET SIZE (TO INSTALL POWER ISOLATOR IN THE SAME CABINET) & MOUNTING REQUIREMENTS WITH FIRE ALARM MANUFACTURER. CONNECT TO CIRCUIT #22(EM).
7. FIRE ALARM ' POWER ISOLATOR ' DEVICE. MOUNT THIS DEVICE NEXT TO 'NAC' PANELS.

Plotted By: Ron Bautista | 12/19/2025 10:27 AM ARL: G:\13058.06\Drawings\Acad\E\EG E109 L4 Flr FA N

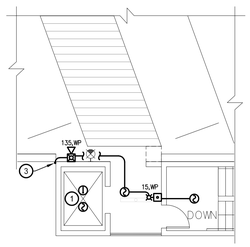


EAST GARAGE (EG)
1 LEVEL 5 PLAN - FIRE ALARM - NEW WORK
SCALE: 1/16" = 1'-0"

TYPICAL FIRE ALARM DEVICE MOUNTING DETAIL
SCALE: NONE



NW CORNER



SE CORNER

2 ENLARGED PLANS - FIRE ALARM - NEW WORK
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO E0.01 & E2.06 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.

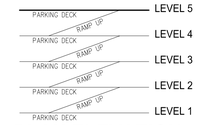
DRAWING NOTES:

1. MOUNT AT TOP OF ELEVATOR SHAFT.
2. RUN ON CEILING OF LEVEL 4 BELOW.
3. RUN NEW FIRE ALARM CONDUIT TURN DOWN TO LEVEL 4 & FACP ON LEVEL 1 (RUN ADJACENT TO EX BLUE PHONE RISER. SIZE FIRE ALARM CONDUIT(S) PER NEC & FIRE ALARM MANUFACTURER'S RECOMMENDATIONS.
4. PROPOSED LOCATION FOR NEW FIRE ALARM FEEDER CONDUIT TURNING UP (NEAR COLUMN) FROM LEVEL 4 TO SERVE FIRE ALARM DEVICES ALONG RAMP WALLS ON LEVEL 5. RUN & SUPPORT SURFACE MOUNTED CONDUIT ALONG WALLS & BETWEEN EXISTING LIGHTING POLE BASES AS SHOWN. REFER TO DETAIL THIS DRAWING.
5. FIRE ALARM DEVICE MOUNTED ON EX LIGHT POLE. REFER TO DETAIL THIS DRAWING.
6. REFER TO DRAWING E1.09 FOR CONTINUATION.

PIC-4

PIC-5

PIC-6



PLAN ELEVATION
SCALE: NONE

FIRE ALARM DEVICES	
TYPE	QUANITITY
	15
	.
	2
	1
	4
	1
	.
	.

0 8' 16' 32' 48'
SCALE: 1/16"=1'-0"

0 4' 8' 16' 24'
SCALE: 1/8"=1'-0"

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PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

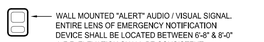
LEVEL 5 PLANS
FIRE ALARM - NEW WORK

DRAWING NO:

E1.10

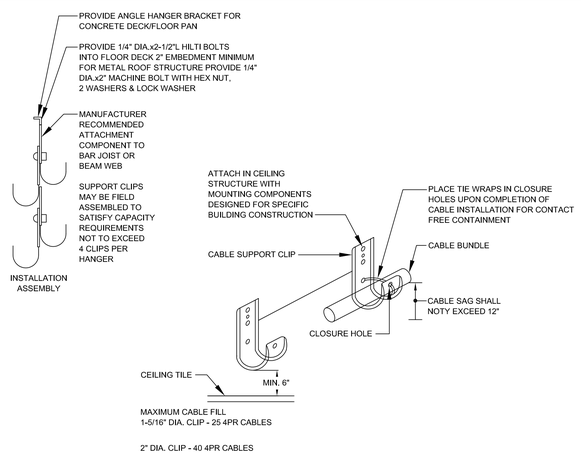
BKM: 13058.06

ARL: G:\13058.06\Drawings\Acad\E\EG E110 L5 Flr FA N
Plotted By: Ron Boulsits | 12/19/2025 10:29 AM



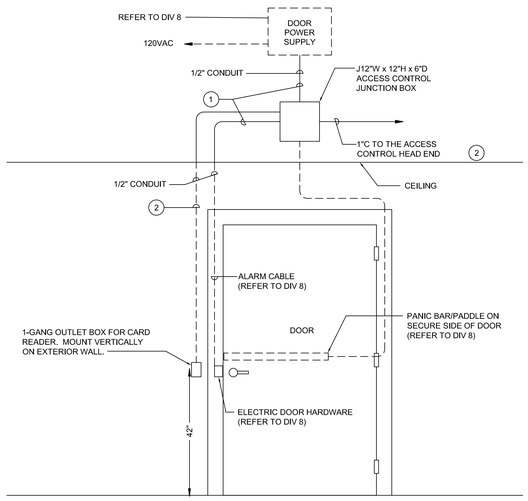
1 **TYPICAL DEVICE MOUNTING HEIGHTS**

SCALE: NONE



2 **J-HOOK CABLE SUPPORT**

SCALE: NONE

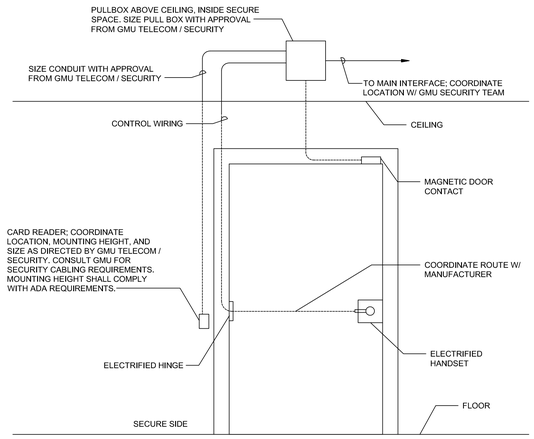


1 LOCK POWER: ONE 4 CONDUCTOR #18 AWG STRANDED. CARD

2 READER: ONE 6 CONDUCTOR #18 AWG TWISTED SHIELDED PAIR.

3 **ACCESS CONTROL SYSTEM CARD READER DETAIL**

SCALE: NONE

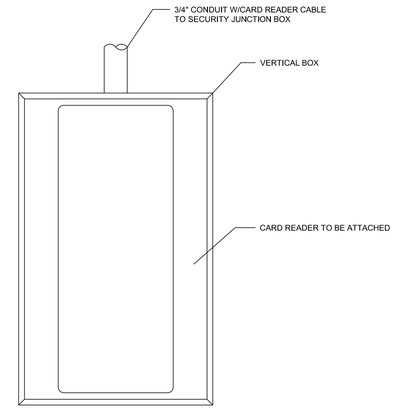


GENERAL NOTES:

1. SEE ARCH DRAWINGS FOR VARIATION DUE TO DOOR
2. TYPES. CONNECTION TO EACH SYSTEM BY OTHERS.
3. DETAIL IS DIAGRAMMATIC TO CONVEY SCOPE OF WORK ONLY. TELECOM / SECURITY PULL BOXES, CONDUITS AND BACKBOXES SHALL BE SIZED BY THE CONTRACTOR WITH APPROVAL OF THE GMU TELECOM / SECURITY TEAM. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS AND MOUNTING HEIGHTS OF SECURITY COMPONENTS WITH GMU TELECOM / SECURITY TEAM PRIOR TO BEGINNING THE WORK.
4. PROVIDE ALL PATHWAY, PULL BOXES, AND BACK BOXES AS REQUIRED FOR SELECTED DOOR HARDWARE. COORDINATE EXACT DOOR HARDWARE WIRING REQUIREMENTS WITH GMU TELECOM / SECURITY TEAM. CONCEAL ALL CONDUIT / WIRING.
5. COORDINATE EXACT LOCATION OF ACCESS CONTROL MAIN INTERFACE PANEL WITH GMU. PROVIDE CONDUIT RUN FROM SECURITY PULL BOX BACK TO MAIN INTERFACE PANEL. PROVIDE (2) MR-52 CONTROL BOARDS IN ACCESS CONTROL PANEL AND POWER SUPPLY. COORDINATE EXACT CONDUIT SIZE AND ROUTING PRIOR TO BEGINNING THE WORK.

4 **TYPICAL DOOR PREPARED FOR CARD READER**

SCALE: NONE



PLAN SYMBOL: CR

5 **TYPICAL VERTICAL MOUNTED CARD READER**

SCALE: NONE

GENERAL NOTES:

1. CONTRACTOR SHALL COORDINATE MOUNTING HEIGHTS OF ALL ROUGH-INS & DEVICES WITH COLLEGE IN FIELD & OBTAIN APPROVAL IN ADVANCE OF WORK.

bkm
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PROJECT NAME:

Montgomery College

MONTGOMERY COLLEGE

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Rockville, MD 20850
Telephone: 240-567-7363

EAST GARAGE FIRE ALARM UPGRADE PHASE No.3 at Montgomery College Takoma Park Campus

SEAL:

PROFESSIONAL CERTIFICATION:

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. _____. EXPIRATION DATE: _____.

ISSUED FOR:

DATE	DESCRIPTION
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11/18/22	95% CD RESUBMISSION
3/17/23	100% CD SUBMISSION
3/29/24	100% FOR CONSTRUCTION
12/19/25	100% FOR CONSTRUCTION

PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **JWW / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

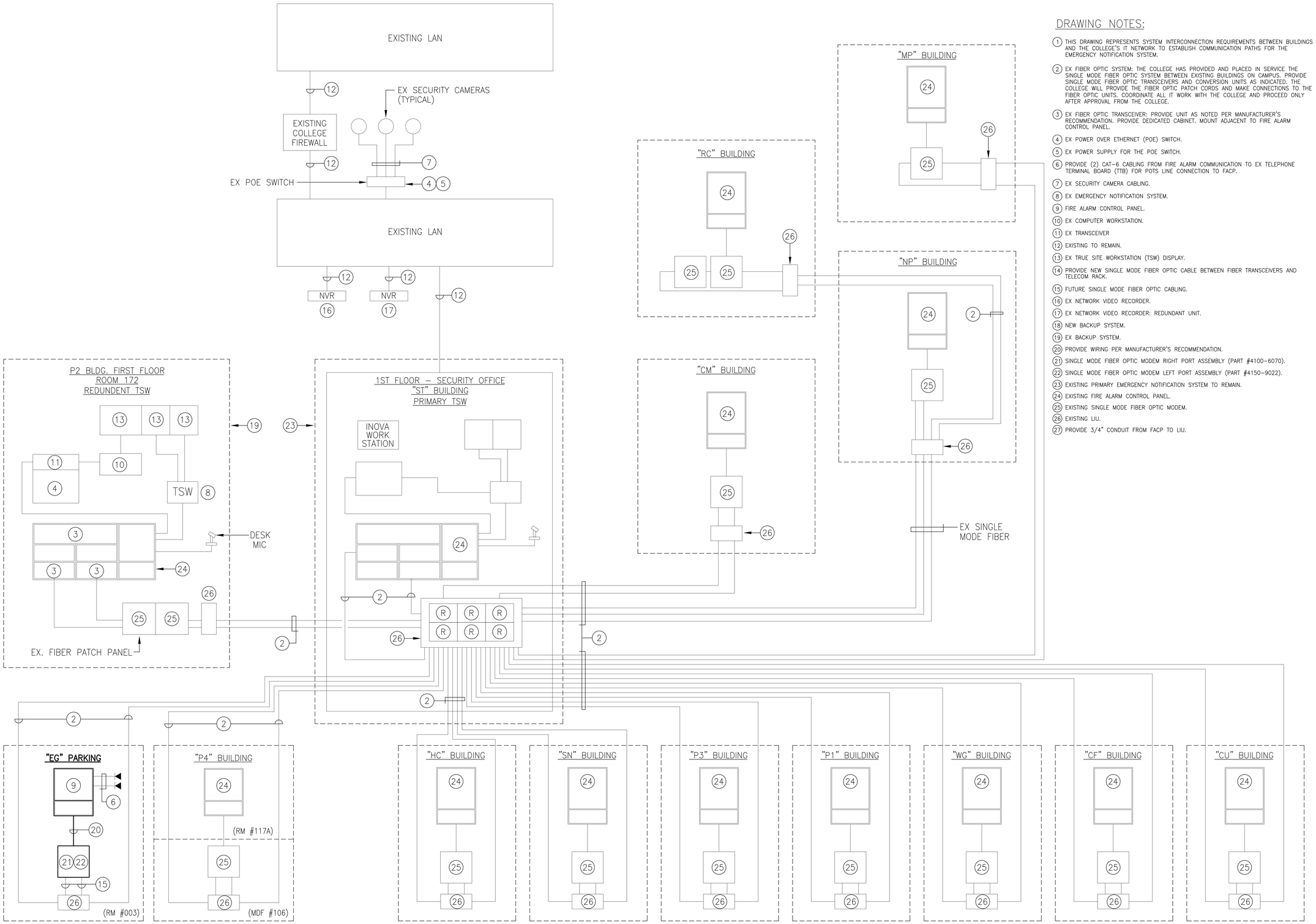
TELECOM DETAILS

DRAWING NO:

E2.01

BKM: 13058.06

Plotted By: Ron Bautista | 12/22/2025 9:05 AM ARL: G:\13058.06\1Drawings\Arch\E\EG E201-2 Details



TAKOMA PARK CAMPUS CONNECTIONS DETAIL (1)

SCALE: NONE

DRAWING NOTES:

1. THIS DRAWING REPRESENTS SYSTEM INTERCONNECTION REQUIREMENTS BETWEEN BUILDINGS AND THE COLLEGE'S IT NETWORK TO ESTABLISH COMMUNICATION PATHS FOR THE EMERGENCY NOTIFICATION SYSTEM.
2. EX FIBER OPTIC SYSTEM: THE COLLEGE HAS PROVIDED AND PLACED IN SERVICE THE SINGLE MODE FIBER OPTIC SYSTEM BETWEEN EXISTING BUILDINGS ON CAMPUS. PROVIDE SINGLE MODE FIBER OPTIC TRANSCEIVERS AND CONVERSION UNITS AS INDICATED. THE COLLEGE WILL PROVIDE THE FIBER OPTIC PATCH CORDS AND MAKE CONNECTIONS TO THE FIBER OPTIC UNITS. COORDINATE ALL IT WORK WITH THE COLLEGE AND PROCEED ONLY AFTER APPROVAL FROM THE COLLEGE.
3. EX FIBER OPTIC TRANSCEIVER: PROVIDE UNIT AS NOTED PER MANUFACTURER'S RECOMMENDATION. PROVIDE DEDICATED CABINET. MOUNT ADJACENT TO FIRE ALARM CONTROL PANEL.
4. EX POWER OVER ETHERNET (POE) SWITCH.
5. EX POWER SUPPLY FOR THE POE SWITCH.
6. PROVIDE (2) CAT-6 CABLING FROM FIRE ALARM COMMUNICATION TO EX TELEPHONE TERMINAL BOARD (TTB) FOR POTS LINE CONNECTION TO FACP.
7. EX SECURITY CAMERA CABLING.
8. EX EMERGENCY NOTIFICATION SYSTEM.
9. FIRE ALARM CONTROL PANEL.
10. EX COMPUTER WORKSTATION.
11. EX TRANSCEIVER
12. EXISTING TO REMAIN.
13. EX TRUE SITE WORKSTATION (TSW) DISPLAY.
14. PROVIDE NEW SINGLE MODE FIBER OPTIC CABLE BETWEEN FIBER TRANSCEIVERS AND TELECOM RACK.
15. FUTURE SINGLE MODE FIBER OPTIC CABLING.
16. EX NETWORK VIDEO RECORDER.
17. EX NETWORK VIDEO RECORDER: REDUNDANT UNIT.
18. NEW BACKUP SYSTEM.
19. EX BACKUP SYSTEM.
20. PROVIDE WIRING PER MANUFACTURER'S RECOMMENDATION.
21. SINGLE MODE FIBER OPTIC MODEM RIGHT PORT ASSEMBLY (PART #4100-6070).
22. SINGLE MODE FIBER OPTIC MODEM LEFT PORT ASSEMBLY (PART #4150-9022).
23. EXISTING PRIMARY EMERGENCY NOTIFICATION SYSTEM TO REMAIN.
24. EXISTING FIRE ALARM CONTROL PANEL.
25. EXISTING SINGLE MODE FIBER OPTIC MODEM.
26. EXISTING LIU.
27. PROVIDE 3/4" CONDUIT FROM FACP TO LIU.

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PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **JWW / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

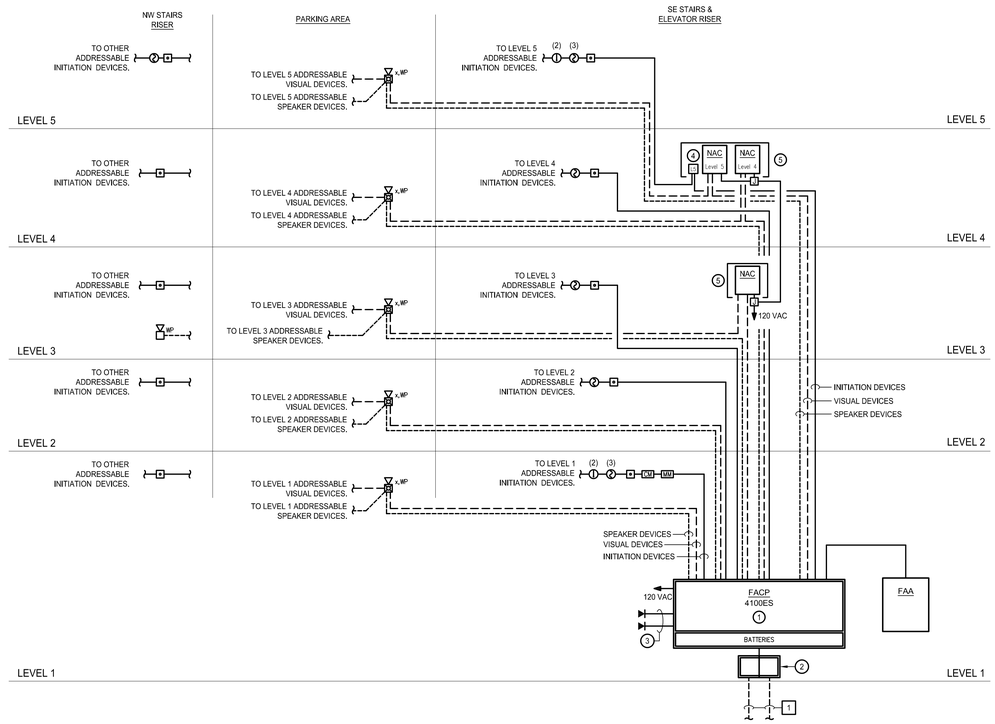
CAMPUS CONNECTION DETAILS

DRAWING NO:

E2.02

BKM: 13058.06

ARL: G:\13058.06\Drawings\Acad\E\EG E201-2 Details
Plotted By: Ron Bautista | 12/22/2025 9:05 AM



NOTE: REFER TO FLOOR PLANS FOR QUANTITY & TYPE OF DEVICES.

1 FIRE ALARM RISER DIAGRAM - NEW WORK

SCALE: NTS

FIRE ALARM SEQUENCE OF OPERATION

NOTES:

SYSTEM INPUTS		SYSTEM OUTPUTS																			
LOCATION	DEVICE TYPE	GENERAL ALARM CONDITION AT THE FACP, ANNUNCIATOR PANEL & BACNET	ACTIVATE ALL AUDIBLE DEVICES (STEADY) UNTIL SILENCE	ACTIVATE VISUAL APPLIANCES UNTIL RESET	ACTIVATE ALARM TO DACT FOR OFF-SITE MONITORING	SHUTDOWN ASSOCIATED AHU	ACTIVATE SUPERVISOR TO DACT FOR OFF-SITE MONITORING	ACTIVATE TROUBLE DACT FOR OFF-SITE MONITORING	ACTIVATE ELEVATOR RECALL SEQUENCE	ACTIVATE ELEVATOR RECALL SEQUENCE - ALTERNATE STOP	ACTIVATE ELEVATOR RED HAT	ACTIVATE ELEVATOR SHUNT TRIP	GENERATE SUPERVISORY CONDITIONS AT FACP, ANNUNCIATOR & BACNET	GENERATE TROUBLE CONDITIONS AT FACP, ANNUNCIATOR & BACNET	RECORD EVENTS ON PRINTER	RELEASE ACCESS CONTROLLED DOORS (CARD READERS)		
ANY	SMOKE DETECTOR	X	X	X	X										X	X					
ANY	PULL STATION	X	X	X	X										X	X					
ELEVATOR LOBBY	SMOKE DETECTOR	X	X	X	X				X						X	X					
ELEVATOR LOBBY MAIN	SMOKE DETECTOR	X	X	X	X					X					X	X					
ELEV. MACH. RM. & HOISTWAY	HEAT DETECTOR	X	X	X	X						X	X			X	X					
ELEV. MACH. RM. & HOISTWAY	SMOKE DETECTOR	X	X	X	X				X		X				X	X					
ANY	SYSTEM FAULT							X						X	X						
ANY	GROUND FAULT							X						X	X						
ANY	BATTERY FAULT							X						X	X						
-	-																				

GENERAL NOTES:

1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. COORDINATE WIRING RECOMMENDATIONS & REQUIREMENTS OF ALL FIRE ALARM DEVICES WITH FIRE ALARM MANUFACTURER.
3. REFER TO FLOOR PLANS FOR QUANTITY & TYPE OF DEVICES.
4. FIRE SEAL & WATER-PROOF ALL NEW FLOOR & WALL PENETRATIONS & MAINTAIN EXISTING FIRE RATING.

DRAWING NOTES:

1. PROVIDE SIMPLEX 4100ES FACP.
2. PROVIDE TRANSCEIVER FOR FIBER OPTIC CABLING FOR FUTURE FIBER OPTIC CONNECTION. REFER TO E2.02 FOR CONTINUATION AND ADDITIONAL DETAILS.
3. PROVIDE (2) CAT-6 CABLES FROM FIRE ALARM COMMUNICATOR IN FACP TO EX TELEPHONE TERMINAL BOARD IN EAST GARAGE (EG). COORDINATE EXACT LOCATION IN FIELD.
4. PROVIDE ' POWER ISOLATOR ' MANUFACTURED BY SIMPLEX #4090-9116. COORDINATE DEVICE QUANTITY WITH FIRE ALARM MANUFACTURER.
5. PROVIDE HOFFMAN WEATHER-PROOF CABINET TO PROTECT NAC PANEL & POWER ISOLATOR MODULE. ALL WIRING SHALL ENTER FROM BOTTOM OF CABINET. COORDINATE ENCLOSURE SIZE & MOUNTING REQUIREMENTS WITH FIRE ALARM MANUFACTURER.

IT DRAWING NOTES:

1 REFER TO DRAWING E2.02 FOR ADDITIONAL INFORMATION.

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PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

FIRE ALARM RISER DIAGRAM NEW WORK

DRAWING NO:

E2.11

BKM: 13058.06

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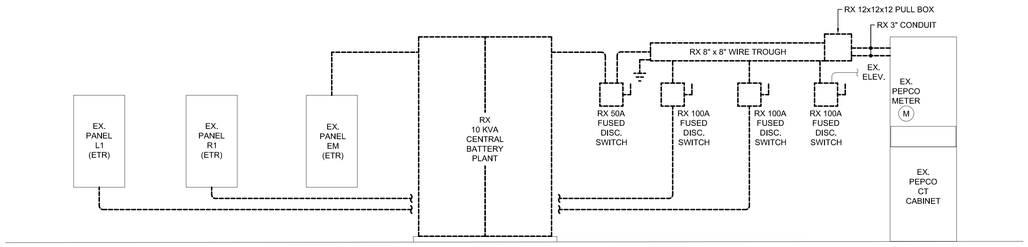
Plotted By: Ron Bouliste | 12/22/2025 9:05 AM



1 POWER RISER DIAGRAM - DEMOLITION

NO SCALE

PANEL: DP RATING: 400 AMPS MAIN: MCB VOLTAGE: 208 Y 120 V 3 PH 4 W
AIC: 22,000 MOUNTING: SURFACE NOTE: SERVICE ENTRANCE LABELED
LOCATION: -

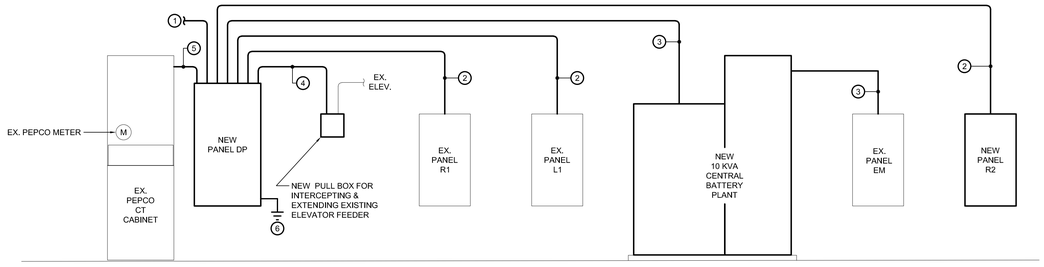
CKT	EQUIPMENT SERVED	LOAD (KVA) AØ	BØ	CØ	CB	BUS	CB	LOAD (KVA) AØ	BØ	CØ	EQUIPMENT SERVED	CKT
1	EX. PANEL L1	10			100	ABC	100	7.1			EX. ELEVATOR	2
3	- - - - - - - - - - - - - - -		9						7.1		- - - - - - - - - - - - - - -	4
5	- - - - - - - - - - - - - - -			9						7.1	- - - - - - - - - - - - - - -	6
7	EX. PANEL R1	7.2			100		50	2			10 KVA INVERTER - PANEL EM	8
9	- - - - - - - - - - - - - - -		7.2						2		- - - - - - - - - - - - - - -	10
11	- - - - - - - - - - - - - - -			7.2						3	- - - - - - - - - - - - - - -	12
13	NEW PANEL R2	3.2			100						SPACE	14
15	- - - - - - - - - - - - - - -		3.0								SPACE	16
17	- - - - - - - - - - - - - - -			0.2							SPACE	18
19	SPACE										SPACE	20
21	SPACE										SPACE	22
23	SPACE										SPACE	24
25	SPACE										SPACE	26
27	SPACE										SPACE	28
29	SPACE										SPACE	30
31	SPACE										SPACE	32
33	SPACE										SPACE	34
35	SPACE										SPACE	36
37	SPACE										SPACE	38
39	SPACE										SPACE	40
41	SPACE										SPACE	42
		20.4	19.2	16.4		SUB-TOTALS		9.1	9.1	9.1		

CONNECTED LOAD:
AØ: 29.5 KVA= 245.8 A
BØ: 28.3 KVA= 235.8 A
CØ: 25.5 KVA= 212.5 A

PANEL: R2 RATING: 100 AMPS MAIN: MLO VOLTAGE: 208 Y 120 V 3 PH 4 W
AIC: 22,000 MOUNTING: SURFACE NOTE:
LOCATION: -

CKT	EQUIPMENT SERVED	LOAD (KVA) AØ	BØ	CØ	CB	BUS	CB	LOAD (KVA) AØ	BØ	CØ	EQUIPMENT SERVED	CKT
1	CU-1 & AC-1	3			50	ABC	20				SPARE	2
3	- - - - - - - - - - - - - - -		3		20		20				SPARE	4
5	RECEPTACLE			0.2	20		20				SPARE	6
7	RECEPTACLE	0.2			20		20				SPARE	8
9	SPARE				20		20				SPARE	10
11	SPARE				20		20				SPARE	12
13	SPACE										SPACE	14
15	SPACE										SPACE	16
17	SPACE										SPACE	18
19	SPACE										SPACE	20
21	SPACE										SPACE	22
23	SPACE										SPACE	24
25	SPACE										SPACE	26
27	SPACE										SPACE	28
29	SPACE										SPACE	30
		3.2	3.0	0.2		SUB-TOTALS		0.0	0.0	0.0		

CONNECTED LOAD:
AØ: 3.2 KVA= 26.7 A
BØ: 3.0 KVA= 25.0 A
CØ: 0.2 KVA= 1.7 A



2 POWER RISER DIAGRAM - NEW WORK

NO SCALE

GENERAL NOTES:

1. REFER TO E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO FLOOR PLANS FOR ADDITIONAL INFORMATION.

DRAWING NOTES:

1. PROVIDE 1 #2 GROUND WIRE IN 1" CONDUIT TO EXISTING BUILDING GROUND SYSTEM.
2. 4 #2, 1 #8 GW IN 1 1/4" CONDUIT.
3. 4 #6, 1 #10 GW IN 1" CONDUIT.
4. 3 #2, 1 #8 GW IN 1 1/4" CONDUIT.
5. (2 SETS) 4 #3/0, 1 #3 GW IN 2" CONDUIT.
6. PROVIDE NEW SERVICE ENTRANCE GROUNDING PER NEC ARTICLE 250.
7. RECONNECT TO EXISTING 50A MCB PANEL EM.

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PROJECT NO: **13058.06**

SCALE: **AS NOTED**

DRAWN BY: **MB**

CHECKED BY: **LSF / RAM**

DATE: 12/19/2025

SHEET TITLE:

EAST GARAGE (EG)

POWER RISER DIAGRAM DEMOLITION & NEW WORK & PANEL SCHEDULES

DRAWING NO:

E3.00

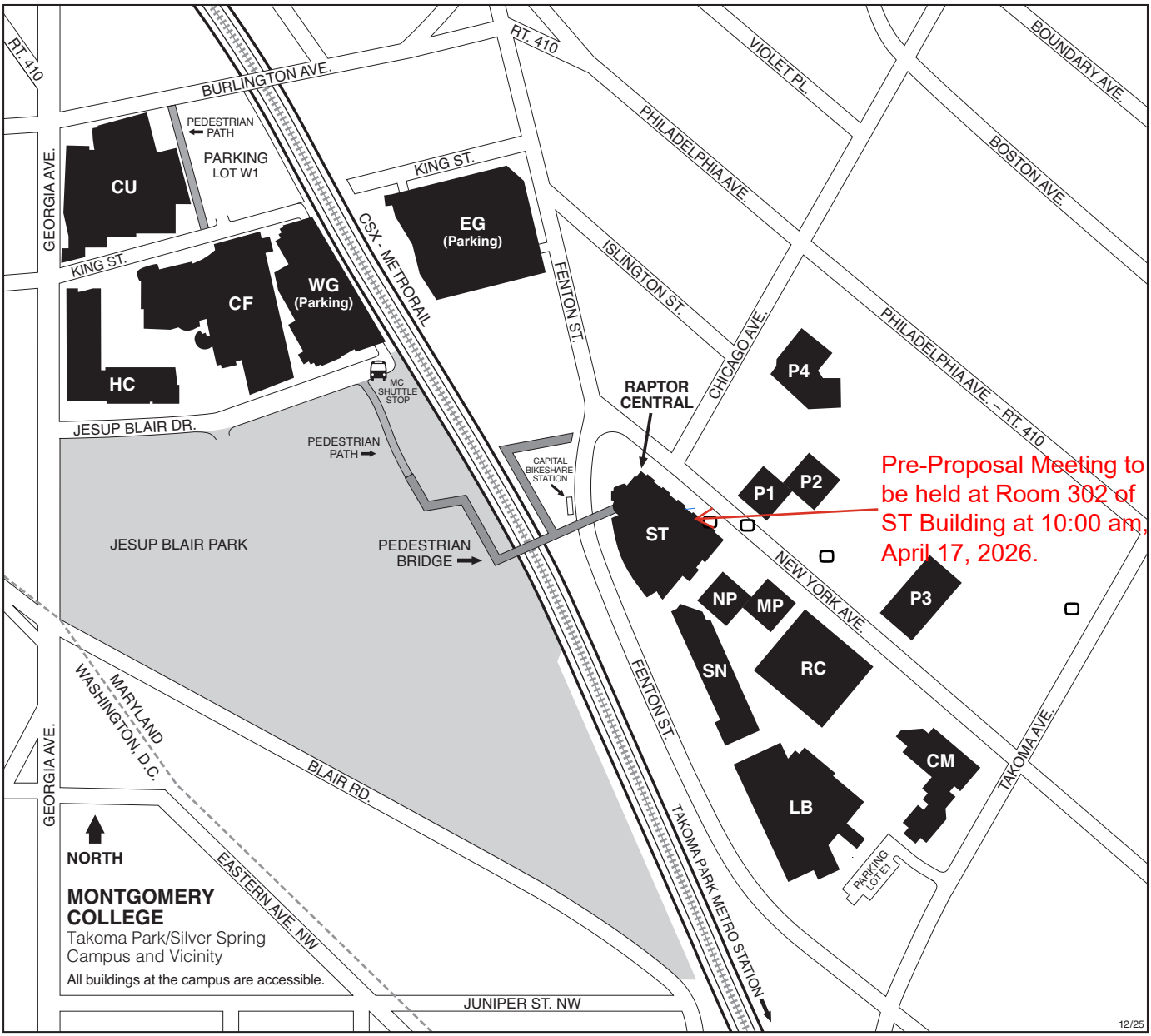
BKM: 13058.06

ARL: G:\13058.06\Drawings\Acad\E\EG E3D0 Riser Diagram D N
Plotted By: Ron Bautista | 12/22/2025 1:42 PM

APPENDIX A Direction to the Pre-Proposal Meeting on the Takoma Park/Silver Spring Campus

MONTGOMERY COLLEGE

Takoma Park/Silver Spring Campus and Vicinity



MONTGOMERY COLLEGE

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7600 Takoma Avenue
Takoma Park, MD 20912
240-567-5000; TTY 301-587-7207

Public Safety: 240-567-3333 (24/7)
montgomerycollege.edu/safety

montgomerycollege.edu/maps

Legend of Campus Buildings

(as of December 2025)

- CF The Morris and Gwendolyn Cafritz Foundation Arts Center
  - *Refugee Training Center*
  - *Workforce Development and Continuing Education (WDCE)*
- CM Catherine F. Scott Commons
- CU Cultural Arts Center
- EG East Garage (parking)
- HC Health Sciences Center
- LB Catherine and Isiah Leggett Math and Science Building
  - *Greenhouse*
  - *Planetarium*
- MP Mathematics Pavilion
- NP North Pavilion
- P1 Pavilion One
- P2 Pavilion Two
- P3 Pavilion Three
- P4 Pavilion Four
- RC Resource Center
  - *Library*
- SN Science North Building
- ST Charlene R. Nunley Student Services Center
  - *Cafeteria*
  - *Counseling and Advising*
  - *Financial Aid Office*
  - *Public Safety Office*
  - *Raptor Central (Admissions, Enrollment, Visitor Services)*
  - *Records and Registration Office*
  - *Student Life Office*
  - *Student Lounge & Distribution HUB*
- WG West Garage (parking)