



UNIVERSITY of MARYLAND

ADMINISTRATION & FINANCE

FACILITIES MANAGEMENT

PENN STREET GARAGE LIGHTING UPGRADE

UNIVERSITY PROJECT # 18-374 BUILDING INVENTORY No. 8078

BID PACKAGE

PROJECT MANUAL

February 22, 2019

Owner

University of Maryland, Baltimore
Office of Facilities Management
620 W Lexington Street, 6th Floor
Baltimore, Maryland 21201

Board of Public Works

Lawrence J. Hogan Jr., Governor
Peter Franchot, Comptroller
Nancy K. Kopp, Treasurer

Maryland General Assembly

Thomas V. Miller Jr, Senate President
Michael Erin Busch, House Speak

Architect

Design & Construction In-House

Civil/Site Engineer

n/a

Structural Engineer

n/a

Information Technology

Design & Construction In-House

MEP Engineer

Design & Construction In-House

Construction Manager

n/a

TABLE OF CONTENTS

DIVISION 1 – GENERAL REQUIREMENTS

01010	SUMMARY OF WORK
01027	APPLICATIONS FOR PAYMENT
01035	MODIFICATION PROCEDURES
01040	COORDINATION
01045	CUTTING AND PATCHING
01095	REFERENCE STANDARDS AND DEFINITIONS
01200	PROJECT MEETINGS
01300	SUBMITTALS
01400	QUALITY CONTROL
01700	CONTRACT CLOSEOUT

DIVISION 16 – ELECTRICAL

DIV 16	SHORT FORM – ELECTRICAL SPECIFICATIONS
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SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Project consists of removing existing parking level lighting, stairwell lighting, elevator lobby lighting, exterior wall sconce and replace with new LED type lighting. Note: Women's Clinic space is not in contract.
- B. Type 'C' lighting fixtures, which will be installed in existing precast opening, the contractor shall provide dimension of existing fixture being replaced before ordering these fixtures.
- C. Contract Documents, dated February 22, 2019 were prepared for the Project by University of Maryland, Design and Construction – Facilities Management.
- D. The project shall not exceed 24 weeks from issuance of P.O., with an additional eight (8) weeks for closeout.
- E. In order for UMB to receive BGE incentives, Contractor must submit an application to BGE *Smart Energy Saver* program and become an approved *Energy Solutions for Business Service Provider* prior to being awarded this contract.
- F. REPAIRS & RESTORATION OF SURFACES AND FINISHES:
 - 1. Restore all finishes, equipment and surfaces to original condition, where affected by the work. Provide the following, where applicable, in accordance with accepted trade standards and to Owner's satisfaction.
 - 2. Replace damaged ceiling tiles.
 - 3. Replace ceiling tiles where removal has left holes or cuts in original tiles.
 - a. 24 x 48, 5/8" thick, Square edge – 24 x 24, 5/8" thick, Square edge. Type, Form, and Finish: Provide Type III, Form 2 units per ASTM E 1264 with painted finish white. Armstrong Fine Fissured or equal.
 - 4. Patch, repair and repaint all walls and surfaces cut, penetrated or otherwise disturbed by the work.
 - 5. Patch holes and penetrations in wood, masonry and plaster.
 - 6. Provide suitable cover plates for all recessed back boxes of equipment removed

and not covered by new devices.

7. Provide larger trim or cover plates for new devices, where old back boxes, holes, etc. are not concealed by new work.

1.3 CONTRACTOR USE OF PREMISES

- A. General: During the construction period the Contractor shall have full use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited only by the University's right to perform work or to retain other contractors on portions of the Project.
- B. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
- C. University Occupancy: Allow for University occupancy and use by the public.
- D. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the University, the University's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- E. Use of the Existing Building: Maintain the existing building condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1.4 OCCUPANCY REQUIREMENTS

- A. Full University Occupancy: The University will occupy the site and existing building during the entire construction period. Cooperate with the University during construction operations to minimize conflicts and facilitate University usage. Perform the Work so as not to interfere with the University's operations.
- B. Perform work as quietly as possible to avoid unnecessary disturbance. Unusual precaution may be necessary in the conduct or work in some areas to achieve satisfactory compliance.
- C. Coordinate with the Owner to perform work producing high noise levels, dust, or hazards to occupants in occupied areas.
- D. Comply with regulations of the Owner pertaining to circulation, sanitation, and behavior of

Contractor's personnel.

- E. Working hours: All work shall be performed during normal business hours – 7:00 AM to 3:30 PM Monday – Friday (garage is closed on weekends except during baseball season). Noise related work shall be done from 6:00 AM to 7:00 AM. Contractor shall provide traffic directions/control (flaggers) when working in the drive aisles. Contractor also has the option to work during the weekends when the garage is closed and there is no traffic.

1.5 PROTECTION OF EXISTING CONSTRUCTION AND FURNISHINGS

- A. The Contractor shall take all necessary precautions to protect the University's property and furnishings. The Contractor shall promptly remedy damage and loss to the University's property caused in whole or in part by the Contractor, a Subcontractor, a Sub-Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible.

1.6 ALTERATIONS TO EXISTING SYSTEMS

- A. Removal and/or relocation of existing services shall be closely coordinated with the Facilities Management if they impact adjacent areas which shall remain operational.
- B. While performing connections and alterations to existing work, the contractor shall take extreme care to protect all existing materials, equipment, casework, etc. from dirt, debris, and damage. Any damage caused by the contractor to existing materials, equipment, casework, etc. shall be repaired to UMB's satisfaction and specifications at the contractor's expense.

1.7 FIRE STOPS AND SMOKE SEALS

- A. Provide fire stops and smoke seals for all services installed and existing services in the project area that pass through fire rated partitions, walls, floors, etc. Services shall include conduit, cables, etc. The area around penetrations including any voids between them must be filled in and sealed with UL fire rated materials equal to adjoining materials. All fire stop insulation devices and sealants shall maintain the fire resistance integrity of the floor, wall partition, etc. and meet ASTM 814-83 F&T rating for time, hours and temperature rise. All fire stopping and sealants shall allow for expansion and contraction movement without pumping free openings. Provide U.L. System Numbers in product submittals for each Fire Stop and Smoke Seal Application.
- B. The installer of fire stop and smoke seal materials shall be a firm licensed or otherwise approved by the manufacturer of the materials and have at least five (5) years experience installing fire stop and smoke seal materials. Installer shall comply with the material manufacturer's recommendations and installation requirements and ASTM and applicable code requirements.

C. All fire stop and smoke seal materials shall be as manufactured by any one of the following manufacturers:

1. Specified Technologies Inc. (STI)
2. DOW Corning Corp.
3. 3M Inc.
4. Hilti.

1.8 Contractor must obtain and pay for photo identification cards for all employees who will be at the construction site.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION

SECTION 01027 - APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Schedules: The Contractor's Construction Schedule and Submittal Schedule are specified in Division 1 Section "Submittals."

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
 - a. Contractor's Construction Schedule.
 - b. Application for Payment forms, including Continuation Sheets.
 - c. List of subcontractors.
 - d. List of products.
 - e. List of principal suppliers and fabricators.
 - f. Schedule of submittals.
 - 2. Submit the Schedule of Values to the University at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Applications for Payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the Schedule of Values:

- a. Project name and location.
 - b. University's Project number.
 - c. Contractor's name and address.
 - d. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - h. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.
 4. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
 5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.
 6. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 7. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.
 8. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications for payment as paid for by the University.
1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
- B. Refer to the University of Maryland Baltimore Standard General Condition of Construction for requirements and procedures governing applications for payment.
- C. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:
1. List of subcontractors.
 2. List of principal suppliers and fabricators.
 3. Schedule of Values.
 4. Contractor's Construction Schedule.
 5. Schedule of principal products.
 6. Submittal Schedule.
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of authorizations and licenses from governing authorities for performance of the Work.
 10. Initial progress report.
 11. Report of preconstruction meeting.
 12. Certificates of insurance and insurance policies.
 13. Performance and payment bonds.
 14. Data needed to acquire the University's insurance.
 15. Initial settlement survey and damage report, if required.
- D. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for University occupancy of designated portions of the Work.
 2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Warranties (guarantees) and maintenance agreements.
 - b. Test/adjust/balance reports.
 - c. Operation and Maintenance Manuals.
 - d. Meter readings if appropriate.

- e. Startup performance reports.
- f. Final cleaning.
- g. Application for reduction of retainage and consent of surety.
- h. Advice on shifting insurance coverages.
- i. List of incomplete Work, recognized as exceptions to University's Certificate of Substantial Completion.

E. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:

- 1. Completion of Project closeout requirements.
- 2. Completion of items specified for completion after Substantial Completion.
- 3. Resolve all previously unsettled claims.
- 4. Resolve all previously incomplete Work.
- 5. Transmittal of required Project construction records to the University.
- 6. Proof that taxes, fees, and similar obligations were paid.
- 7. Removal of temporary facilities and services.
- 8. Removal of surplus materials, rubbish, and similar elements.
- 9. Change of door locks to University's access.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01035 - MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing contract modifications.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Submittals" for requirements for the Contractor's Construction Schedule.
 - 2. Division 1 Section "Applications for Payment" for administrative procedures governing Applications for Payment.

1.3 MINOR CHANGES IN THE WORK

- A. The University will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time.

1.4 CHANGE ORDER PROPOSAL REQUESTS

- A. University-Initiated Proposal Requests: The University will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal requests issued by the University are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
 - 2. Within a mutually agreed upon time period, submit an estimate of cost necessary to execute the change to the University for review.
 - a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities. Include required labor hours and unit costs, with totals for each labor category. Include all credits for deleted work.

- b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts, for new work and deleted work.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.
- B. Contractor-Initiated Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the University.
1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 2. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities. Include required labor hours and unit costs, with totals for each labor category. Include all credits for deleted work.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts, for new work and deleted work.
 4. Comply with requirements in Section "Product Substitutions" if the proposed change requires substitution of one product or system for a product or system specified.
- C. Proposal Request Form: Use forms provided by the Owner for Change Order Proposals.

1.5 CHANGE ORDER PROCEDURES

- A. Upon the University's approval of a Proposal Request, the University will issue a Change Order Requisition for signatures of the Contractor followed by a Notice to Proceed.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. General project coordination procedures.
2. Conservation.
3. Coordination Drawings.
4. Administrative and supervisory personnel.
5. Cleaning and protection.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Project Meetings" for progress meetings, coordination meetings, and preinstallation conferences.
2. Division 1 Section "Submittals" for preparing and submitting all submittals.
3. Division 1 Section "Materials and Equipment, Delivery, Storage and Handling" for coordinating general installation.
4. Division 1 Section "Contract Closeout" for coordinating contract closeout.

1.3 COORDINATION

- A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to assure required minimum accessibility for maintenance, service, and repair.
 3. Make provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
1. Prepare similar memoranda for the University and sub-contractors where coordination of their work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of CPM schedules.
 2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Work coordination meetings.
 6. Project closeout activities.
- D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components. At a minimum, prepare coordination drawings for all mechanical rooms, electrical rooms and substation rooms.
1. Show the relationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.
 3. Comply with requirements contained in Section "Submittals."

- B. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.
1. Post copies of the list in the Project meeting room, the temporary field office, and at each temporary telephone.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.2 CLEANING AND PROTECTION

- A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration until Substantial Completion.
- B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.
- C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 1. Excessive static or dynamic loading.
 2. Excessive internal or external pressures.
 3. Excessively high or low temperatures.
 4. Thermal shock.
 5. Excessively high or low humidity.

6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining, and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. Electrical current.
20. High-speed operation.
21. Improper lubrication.
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

END OF SECTION

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for cutting and patching.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Coordination" for procedures for coordinating cutting and patching with other construction activities.
 - 2. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - a. Refer to Division 16 Sections for additional requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the University requires approval of these procedures before proceeding. Obtain approval to proceed from the University. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required. Show how it to structural elements and operating components as well as changes in the will be performed and indicate why it cannot be avoided.
 - 2. Describe anticipated results in terms of changes to existing construction. Include changes building's appearance and other significant visual elements.
 - 3. List products to be used and firms or entities that will perform Work.
 - 4. Indicate dates when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
 - 6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.

7. Approval by the University to proceed with cutting and patching does not waive the University's right to later require complete removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain hot work permit from the University for cutting, burning, welding, etc. (See attached).
2. Obtain approval of the cutting and patching proposal before cutting and patching the structural elements.

- B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal from the University before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment.
 - b. Air or smoke barriers.
 - c. Water, moisture, or vapor barriers.
 - d. Fire protection systems.
 - e. Noise and vibration control elements and systems.
 - f. Control systems.
 - g. Communication systems.
 - h. Conveying systems.
 - i. Electrical wiring systems.

- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the University's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner when directed by the University.

1.5 WARRANTY

- A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials. Refer to applicable spec sections for materials.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.
 - 1. Before proceeding, meet at the Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them or to take them out of service.

3.3 PERFORMANCE

- A. General: Employ skilled workmen or experienced subcontractors to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.
 1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 3. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
 4. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Ensure all services have been de-energized or drained before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat. Prepare entire surface to receive final coat as necessary for proper adhesion.
 4. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.4 CLEANING

- A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar

features before applying paint or other finishing materials.

END OF SECTION

SECTION 01095 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic contract definitions are included in the Conditions of the Contract.
- B. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.
- C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the University, requested by the University, and similar phrases.
- D. "Approved": The term "approved," when used in conjunction with the University's action on the Contractor's submittals, applications, and requests, is limited to the University's duties and responsibilities as stated in the Conditions of the Contract.
- E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are

required to be experienced in the operations they are engaged to perform.

1. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
 2. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
- J. "Project Site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on CSI's 16-Division format and UMB's Master format numbering system.
- B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:
 1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Streamlined Language: The Specifications generally use the imperative mood and

streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

- a. The words "shall be" are implied where a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

- A. **Applicability of Standards:** Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. **Publication Dates:** Comply with the standards in effect as of the date of the Contract Documents.
- C. **Conflicting Requirements:** Where compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer to the University before proceeding for a decision on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.
 1. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum acceptable. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the University for a decision before proceeding.
- D. **Copies of Standards:** Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.
- E. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations," available in most libraries.

1.5 SUBMITTALS

- A. Permits, Licenses, and Certificates: For the University's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
 - 1. Preconstruction conferences.
 - 2. Progress meetings.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Coordination" for procedures for coordinating project meetings with other construction activities.
 - 2. Division 1 Section "Submittals" for submitting the Contractor's Construction Schedule.

1.3 PRECONSTRUCTION CONFERENCE

- A. The University shall schedule a preconstruction conference before starting construction, at a time convenient to the Contractor and the University, but no later than 15 days after execution of the Agreement. The conference will be held at a site identified by the University.
 - 1. The University will conduct the meeting. Minutes will be recorded and distributed to participants in accordance with contract requirements.
- B. Attendees: Authorized representatives of the University, University, and their consultants; the Contractor and its superintendent; major subcontractors; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: Discuss items of significance that could affect progress, including, but not limited to, the following:
 - 1. Tentative construction schedule.
 - 2. Critical work sequencing.

3. Designation of responsible personnel.
4. Procedures for processing field decisions and Change Orders.
5. Procedures for processing Applications for Payment.
6. Procedures for processing Requests for Information (RFI's).
7. Procedures for processing University's Supplemental Instructions and Contract Clarification.
8. Distribution of Contract Documents.
9. Submittal of Shop Drawings, Product Data, and Samples.
10. Preparation of record documents.
11. Use of the premises.
12. Parking availability.
13. Office, work, and storage areas.
14. Equipment deliveries and priorities.
15. Safety procedures.
16. First aid.
17. Security.
18. Housekeeping.
19. Working hours.
20. Utility outages.
21. Testing.

1.4 PROGRESS MEETINGS

- A. The University shall schedule and administer bi-weekly progress meetings throughout the progress of work. The progress meetings will be held at a site identified by the University.
 1. The Contractor will conduct the meeting, record minutes, and distribute copies to participants.
- B. Attendees: In addition to representatives of the University and the University, each subcontractor, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.
 1. Contractor's Construction Schedule: Review progress since the last meeting. Determine status of each activity in relation to the Contractor's Construction Schedule, whether on time, ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and

- subsequent activities will be completed within the Contract Time. Identify additional tasks becoming critical due to delays.
2. Review the present and future needs of each entity present, including, but not limited to, the following:
 - a. Interface requirements.
 - b. Time.
 - c. Sequences.
 - d. Status of submittals.
 - e. Deliveries.
 - f. Off-site fabrication problems.
 - g. Access.
 - h. Site utilization.
 - i. Temporary facilities and services.
 - j. Hours of work.
 - k. Hazards and risks.
 - l. Housekeeping.
 - m. Quality and work standards.
 - n. Change Orders.
 - o. Documentation of information for payment requests.
 - p. Review submittal log.
 - q. Review RFI log.
 - r. Review Change Order log.
 - s. Review upcoming outages, testing and inspections.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for all submittals, required for the installation and completion of the work for the project. Submittals include three (3) types of submittals, Construction Submittals, Administrative Submittals and Quality Control Submittals as defined hereinafter,

- B. Related Sections: The following Sections contain requirements that relate to this Section:

- 1. Division 1 Section "Applications for Payment" specifies requirements for submittal of the Schedule of Values.
- 2. Division 1 Section "Coordination" specifies requirements governing preparation and submittal of required Coordination Drawings.
- 3. Division 1 Section "Project Meetings" specifies requirements for submittal and distribution of meeting and conference minutes.
- 4. Division 1 Section "Quality Control" specifies requirements for submittal of inspection and test reports.
- 5. Division 1 Section "Contract Closeout" specifies requirements for submittal of Project Record Documents and warranties at project closeout.
- 6. Division 1 Section "Schedules and Reports" specifies requirements for submittal of required schedules and reports, including the submittal schedule.

- C. UMB Standard Project Forms

- 1. The CM, Contractors, and A/E shall use the following UMB Standard Project Submittal Forms for all submissions as follows:
 - a. UMB Standard Project Submittal Tracking Form
 - b. UMB Standard Project Submittal Form
 - c. UMB Standard Project RFI Form
- 2. These forms are included in Part 2 Products for reference and each form's individual electronic file is available at the UMB Architecture Engineering and Construction

Documents web site at <http://www.umbfm.umaryland.edu> then through the link for AEC Standards.

1.3 DEFINITIONS

A. Construction Submittals: Construction Submittals are defined as submittals which include all information related to products, materials, and equipment used for the construction of the project. Unless otherwise indicated all references to "Submittals" in the documents are for Construction Submittals. Construction Submittals: Such submittals shall include, but are not limited to, the following:

1. Contractor's construction schedule.
2. Submittal schedule.
3. Daily construction reports.
4. Shop Drawings.
5. Product Data.
6. Quality assurance submittals.
7. Fabrication drawings.
8. Installation drawings.
9. Shopwork manufacturing instructions.
10. Templates and patterns.
11. Schedules.
12. Requests for Information (RFI's).

B. Administrative Submittals: Administrative Submittals are defined as submittals which include all information related to administrative documentation for the project. Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals shall include, but are not limited to, the following:

1. Permits.
2. Applications for Payment.
3. Performance and payment bonds.
4. Insurance certificates.
5. List of subcontractors.

C. Quality Control Submittals: Quality-control submittals are defined as submittals which include all information related to administrative documentation for the project. Such submittals shall include, but are not limited to, the following:

1. Design data.
2. Certifications.
3. Manufacturer's instructions.
4. Manufacturer's field reports.

D. Product Data: Product data shall include, but are not limited to, the following:

1. Manufacturer's product specifications.
2. Manufacturer's installation instructions.
3. Standard color charts.
4. Catalog cuts.
5. Roughing-in diagrams and templates.
6. Standard wiring diagrams.
7. Printed performance curves.
8. Operational range diagrams.
9. Standard product operating and maintenance manuals.
10. Certified capacity and performance data.

1.4 GENERAL SUBMITTAL PROCEDURES

- A. Submissions: UMB requires that all construction and administration type submittals be transmitted electronically in “pdf” format for all products, materials, and equipment related to construction and all documentation related to the administration of the project. However UMB will accept hard copies (paper copies) of construction and administration type submittals from the CM when electronic files cannot be used.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay, and in accordance with the project schedule.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The University reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
 3. Scheduling: Division 1 Section “Schedules and Reports” includes the Submittal Schedule listing submittals and indicating time requirements for coordination of submittal activity with related construction operations.
 4. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for

resubmittals.

- a. Allow four (4) weeks for initial review. Allow additional time if the University must delay processing to permit coordination with subsequent submittals.
- b. If an intermediate submittal is necessary, process the same as the initial submittal.
- c. Allow four (4) weeks for reprocessing each submittal.
- d. No extension of Contract Time will be authorized because of failure to transmit submittals to the University sufficiently in advance of the Work to permit processing.
- e. The Contractor and CM shall conduct an internal review of every submittal to ensure accuracy and completeness prior to submission to the A/E.

C. Submittal Preparation: The Contractor or CM shall attach the UMB Standard Project Submittal Tracking Form to one (1) electronic file for each submittal. The Contractor or CM shall also attach the UMB Standard Project Submittal Form to the electronic file for each submittal. The contractor or CM shall complete the upper portion of the forms as appropriate.

D. Submittal Transmittal: Include an electronic transmittal with each submittal file for transmittal and handling. Each submittal file shall be transmitted electronically from the Contractor to the CM, then to the A/E. Forward a copy of the electronic transmittal to the UMB OFM Project Manager. The A/E and the University will not accept submittals received from sources other than the Contractor or CM.

1. On the transmittal, record relevant project information.
2. Include Contractor's certification that information submitted complies with Contract Document requirements.
3. Transmittal Form: Prepare. Use the UMB Standard Submittal Transmittal Form. In the places on the form provide the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of the subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Submittal and transmittal distribution record.
 - i. Remarks.
 - j. Signature of transmitter.

E. Requests for Information (RFI's): Use the UMB Standard RFI Form for all Requests for Information. The CM or contractor shall submit each RFI to the A/E and copy the UMB OFM Project Manager.

F. Shop Drawings

1. In addition to the general submittal procedures, the following requirements apply to shop drawings and coordination drawings:
 - a. Submit newly prepared information drawn accurately to scale. Indicate deviations from the Contract Documents. The CM or contractor shall not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
2. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
 - a. Dimensions.
 - b. Identification of products and materials included by sheet and detail number.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
3. Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
4. Hard Copy Submittal: When hard copy submittals are used submit one (1) reproducible drawing for review by the A/E. The A/E will review and make appropriate comments on the reproducible drawing, sign off the UMB forms with action taken, make one (1) print for their record, and forward the reproducible drawing to the University. The University will review and make additional comments as necessary, forward their comments to the A/E for their record and information, make one (1) copy for their use and return the reproducible drawing to the Contractor. For submittals requiring resubmission, the process will be repeated until submittals are considered acceptable by the A/E and the University.
5. Electronic Copy Submittal: When electronic copy submittals are used submit one (1) electronic file for each drawing for review by the A/E. The A/E will review and make appropriate comments on the electronic file, sign off the UMB forms

with action taken, retain one (1) copy for their record, and forward the electronic

file to the University. The University will review and make additional comments as necessary; forward their comments to the A/E for their record and information, retain one (1) copy of the electronic file for their use, and return the electronic file to the CM or Contractor. For submittals requiring resubmission, the process will be repeated until submittals are considered acceptable by the A/E and the University.

6. Shop Drawing shall not be used without an appropriate final stamp indicating the action taken.

B. Product Data

1. In addition to the general submittal procedures, the following requirements apply to product data submittals:
 - a. Collect Product Data into a single submittal for each element of construction or system. Product Data shall include printed information, such as manufacturer's general product information, installation instructions, catalog cuts, standard color charts, roughing-in dimensions, diagrams and templates, standard wiring diagrams, and performance data and curves.
 - b. Mark each copy to show applicable choices and options. Where printed product data includes information on several products that are either not required or are optional materials, arrangements or components that require a selection or indicator, mark copies to indicate the applicable information. Include the following information:
 - 1) Manufacturer's printed recommendations.
 - 2) Compliance with trade association standards.
 - 3) Compliance with recognized testing agency standards.
 - 4) Application of testing agency labels and seals.
 - 5) Notation of dimensions verified by field measurement.
 - 6) Notation of coordination requirements.
 - 7) Compliance with contract documents.
 - 8) Specification Section and paragraph.
 - c. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 - d. Hard Copy Submittals: When hard copy submittals are used submit six (6) copies, plus the number required for the CM and Contractor's use, of each required submittal for review by the A/E. The A/E will review and make

appropriate comments on each copy, sign off the UMB forms with action taken, retain two (2) copies for their records and forward the remaining

submittals to the University. The University will review the submittals, make additional comments as necessary, forward their comments to the A/E for their records, retain one (1) copy of each submittal, and return the remaining submittals to the Contractor. For submittals requiring resubmission, the process will be repeated until submittals are considered acceptable by the A/E and the University.

- e. Electronic Copy Submittals: When electronic copy submittals are used submit one (1) electronic file for each required submittal for review by the A/E. The A/E shall review and make appropriate comments on the electronic file, sign off the UMB forms with action taken, retain one (1) copy for their record and forward the electronic file to the University. The University will review and make additional comments as necessary, sign off the UMB forms, retain one (1) copy of the electronic file for their use, forward their comments to the A/E for their record and information, and return the electronic file to the CM or Contractor. For submittal files requiring resubmission, the process will be repeated until submittals are considered acceptable by the A/E and the University.
- f. Distribution: Forward one (1) copy of each approved submittal file to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
- g. Do not proceed with installation until a copy of approved Product Data is in the Installer's possession.
- h. Do not permit use of unmarked copies of Product Data in connection with construction.
- i. The Contractor shall retain three (3) copies of the final submittals for inclusion in the O&M Manuals.

C. Quality Assurance Submittals

- 1. In addition to the general submittal procedures, the following requirements apply to quality assurance submittals:

- a. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.
- b. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.
- c. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.
- d. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 1 Section "Quality Control."

D. Architect/Engineer's (A/E) Action

1. The A/E will review each submittal, mark to indicate action taken, and transmit the submittals promptly to the UMB OFM Project Manager.
 - a. Compliance with the contract documents is the Contractor's responsibility.
2. Submittal Action: The A/E will fill in the appropriate boxes on the UMB Standard Project Submittal Tracking Form attached to each set of submittals. The A/E will also fill in the appropriate boxes on the UMB Standard Project Submittal Form attached to each submittal and attach their comments as necessary. The University will fill in the lower portion of the form as necessary on each submittal to indicate the University has reviewed the submittals. The A/E's submittal stamp should not be used on submittals for UMB projects

E. Construction Manager's (CM) Or Contractor Action

1. The CM shall be responsible for the collection of all project submittals from the suppliers and sub contractors for distribution to the A/E and the University for review. The CM is responsible for the redistribution of the reviewed submittals back to the sub contractors and suppliers for appropriate action based on the A/E and University review comments.
2. Submittal Action: The UMB Standard Project Submittal Form will indicate how the CM or Contractor needs to proceed with each submittal as follows:
 - a. Action – "No Exceptions Taken": Submittals returned to the CM as "No

Exceptions Taken" indicates the submitted material and equipment appears to comply with requirements of the Contract Documents and therefore the work related to the submittal can proceed. Final payment depends on that compliance.

- b. Action – "Note Markings/Attachments": Submittals returned to the CM as "Note Markings/Attachments" indicates the submitted material and equipment will appear to comply with requirements of the Contract Documents provided the noted comments become a part of the submission and therefore the work related to the submittal can proceed. Final payment depends on that compliance.
 - c. Action – "Amend & Resubmit": Submittals returned to the CM as "Amend & Resubmit" indicates some of the submitted material and equipment does not comply with the requirements of the Contract Documents and therefore the work related to the submittal cannot proceed until the re-submittal process confirms that the material and equipment complies with the requirements of the Contract Documents. Final payment depends on that compliance.
 - d. Action – "Rejected/Resubmit": Submittals returned to the CM as "Rejected/Resubmit" indicates that there are significant and fundamental deficiencies indicated in the submitted material and equipment, and does not comply with the requirements of the Contract Documents. Therefore the work related to the submittal cannot proceed until the re-submittal process confirms that the material and equipment complies with the requirements of the Contract Documents. Final payment depends on that compliance.
3. When the CM or Contractor receives submittals as "Amend & Resubmit" or "Rejected/Resubmit," the CM or Contractor shall not proceed with work covered by these submittals, including purchasing, fabrication, delivery, or other activity. Revise or prepare new submittals according to the notations; resubmit without delay. Repeat as necessary to obtain acceptance from the A/E and UMB.
 4. Do not use, or allow others to use, submittals marked "Amend & Resubmit" or "Rejected/Resubmit" at the Project Site or elsewhere where work is in progress.
 5. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the University will return the submittal marked "Action Not Required."

PART 2 - PRODUCTS

2.1 UMB STANDARD PROJECT SUBMITTAL TRACKING FORM

- A. The electronic file for this form is available at the UMB Architecture Engineering and Construction Documents web site.

UMB STANDARD PROJECT SUBMITTAL TRACKING FORM

Contractor/Subcontractor: _____

Type of Submittal	Date:
<input type="checkbox"/> Shop Drawing	
<input type="checkbox"/> Product Data	Spec. Description:
<input type="checkbox"/> Samples	
<input type="checkbox"/> Certifications	Submittal No.
<input type="checkbox"/> Record Drawings	
<input type="checkbox"/> Other	Description:

To be filled out by CM/GC

Date: _____	Remarks:
To: _____	cc: UMB PM
Attn: _____	
From: _____	Submittal No.
Copies: _____	
Transmittal copy to UMB	Description:

To be filled out by Architect

Date: _____	Remarks:
To: _____	
Attn: _____	
From: _____	
Copies: _____	

No Exceptions Taken Note Markings/Attachments Amend & Resubmit Rejected/Resubmit

To be filled out by Engineer

Date: _____	Remarks:
To: _____	
Attn: _____	
From: _____	
Copies: _____	

No Exceptions Taken Note Markings/Attachments Amend & Resubmit Rejected/Resubmit

To be filled out by UMB-PM

Date: _____	Remarks:
To: _____	
Attn: _____	
From: _____	
Copies: _____	

No Exceptions Taken Note Markings/Attachments Amend & Resubmit Rejected/Resubmit

To be filled out by UMB Reviewer

Date: _____	Remarks:
To: _____	
Attn: _____	
From: _____	
Copies: _____	

No Exceptions Taken Note Markings/Attachments Amend & Resubmit Rejected/Resubmit

2.2 UMB STANDARD PROJECT SUBMITTAL FORM

A. The electronic file for this form is available at the UMB Architecture Engineering and

Construction Documents web site.

UMB STANDARD PROJECT SUBMITTAL FORM

UMB PROJECT NAME: _____ UMB PROJECT NUMBER: _____ UM SYSTEM CAMPUS: _____	
CONTRACTOR: Submission is in compliance with contract requirements, including dimensions, quantities and all trade coordination. <input type="checkbox"/> Submitted as specified <input type="checkbox"/> Substitution in accordance with <i>Insert Spec Section Here</i> Date: ___/___/___ By: _____	CM: Submittal No: _____ <i>Insert Submittal # above</i> <input type="checkbox"/> Submission to the University and AE is in accordance with <i>Contract Insert Contract No. Here</i> <input type="checkbox"/> Disapproved Date: ___/___/___ By: _____
PROJECT ARCH: <input type="checkbox"/> No Exceptions Taken <input type="checkbox"/> Note Markings/Attachments <input type="checkbox"/> Amend & Resubmit <input type="checkbox"/> Rejected/Resubmit Review of the submission by the Architect is in accordance with and governed by the Architect Agreement <i>Insert Contract # here</i> . For explanation of the Architect's review comments, refer to Section <i>Insert Spec Section here</i> of the Specifications. Date: ___/___/___ By: _____	ASSOCIATED ARCH: <input type="checkbox"/> No Exceptions Taken <input type="checkbox"/> Note Markings/Attachments <input type="checkbox"/> Amend & Resubmit <input type="checkbox"/> Rejected/Resubmit Date: ___/___/___ By: _____
CIVIL ENGINEER: <input type="checkbox"/> No Exceptions Taken <input type="checkbox"/> Note Markings/Attachments <input type="checkbox"/> Amend & Resubmit <input type="checkbox"/> Rejected/Resubmit Date: ___/___/___ By: _____	STRUCTURAL ENGINEER: <input type="checkbox"/> No Exceptions Taken <input type="checkbox"/> Note Markings/Attachments <input type="checkbox"/> Amend & Resubmit <input type="checkbox"/> Rejected/Resubmit Date: ___/___/___ By: _____
MEP ENGINEER: <input type="checkbox"/> No Exceptions Taken <input type="checkbox"/> Note Markings/Attachments <input type="checkbox"/> Amend & Resubmit <input type="checkbox"/> Rejected/Resubmit Date: ___/___/___ By: _____	CONSULTANT: <input type="checkbox"/> No Exceptions Taken <input type="checkbox"/> Note Markings/Attachments <input type="checkbox"/> Amend & Resubmit <input type="checkbox"/> Rejected/Resubmit Date: ___/___/___ By: _____
OWNER: Date: ___/___/___ Regional Review By: _____ Date: ___/___/___ UMB Review By: _____ Owner Comments: _____ _____ Review by Owner does not relieve the CM and/or AE of their obligations under the above noted contracts respectively.	

2.3 UMB STANDARD PROJECT RFI FORM

A. The electronic file for this form is available at the UMB Architecture Engineering and

Construction Documents web site.

UMB STANDARD REQUEST FOR INFORMATION FORM

REQUEST FOR INFORMATION (RFI) No.:	Date:
Subject:	UMB Project Title:
Discipline:	UMB Project No.:
Specification Reference:	Importance:
Drawing Reference:	Return RFI By:

Information Requested:

Requested By:	Date Requested:
----------------------	------------------------

Contractors Proposed Solution:

Submitted By:	Date Submitted:
----------------------	------------------------

A/E Response:

Reviewed By:	Date Reviewed:
---------------------	-----------------------

UMB Response:

Reviewed By:	Date Reviewed:
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PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality-control services.
- B. Quality-control services include inspections, tests, and related actions, including reports, performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by the University.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
 - 1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services required by the University or authorities having jurisdiction are not limited by provisions of this Section.
- E. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Cutting and Patching" specifies requirements for repair and restoration of construction disturbed by inspection and testing activities.
 - 2. Division 1 Section "Submittals" specifies requirements for development of a schedule of required tests and inspections.

1.3 RESPONSIBILITIES

- A. Contractor Responsibilities: Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum.
1. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor may perform testing by its own workforce. The Contractor shall employ and pay a qualified independent testing agency to perform quality-control services for the following list of testing requirements: Costs for these services are included in the Contract Sum.
 2. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the University's responsibility, the University will employ and pay a qualified independent testing agency to perform those services.
- B. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.
1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.
- C. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:
1. Provide access to the Work.
 2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
 3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
 4. Provide facilities for storage and curing of test samples.
 5. Deliver samples to testing laboratories.
 6. Provide the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 7. Provide security and protection of samples and test equipment at the Project Site.

- D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the University and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.
1. The agency shall notify the University and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
 3. The agency shall not perform any duties of the Contractor.
- E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

1.4 SUBMITTALS

- A. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the University. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.
1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
 2. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:
 - a. Date of issue of report.
 - b. Project title and number.
 - c. Name, address, and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the Work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - i. Test results and an interpretation of test results.
 - j. Ambient conditions at the time of sample taking and testing.
 - k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.
 - m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

- A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.
 - 1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.
- C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:

- 1. Inspection procedures.
- 2. Project record document submittal, including the following:
 - a. Marked-up copies of Contract Drawings.
 - b. Marked-up copies of Shop Drawings.
 - c. Newly prepared drawings.
 - d. Marked-up copies of Specifications, addenda, and Change Orders.
 - e. Marked-up Product Data submittals.
 - f. Field records for variable and concealed conditions.
 - g. Record information on Work that is recorded only schematically.
- 3. Operation and maintenance manual submittal.
 - a. Preparing and submitting operation and maintenance manuals for building operating systems and equipment.
 - b. Preparing and submitting instruction manuals covering the care, preservation, and maintenance of University products and finishes.
 - c. Instruction of the University's operating personnel in the operation and maintenance of building systems and equipment.
- 4. Submittal of warranties.
- 5. Final cleaning.

- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 16.

- C. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and antipollution regulations.

- 1. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.
- 2. Burning or burying of debris, rubbish, or other waste material on the premises is not

permitted.

- D. Maintenance of Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and Samples available at all times for the University's inspections.
- E. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 DEFINITIONS

- A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the University.
- B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the University.

1.4 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the University has benefited from use of the Work through a portion of its anticipated useful service life.
- D. University's Recourse: Expressed warranties made to the University are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise

available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the University can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The University reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the University reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.5 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
 - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
2. Advise the University of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
4. Obtain and submit releases enabling the University unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra stock, and similar items, including inventory list.
7. Make final changeover of permanent locks and transmit keys to the University. Advise the University's personnel of changeover in security provisions.
8. Complete startup testing of systems and instruction of the University's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
9. Complete final cleanup requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred, exposed finishes.

- B. Inspection Procedures: On receipt of a request for inspection, the University will either proceed with inspection or advise the Contractor of unfilled requirements. The University will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The University will repeat inspection when requested and assured that the Work is substantially complete.
 2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.6 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the University's final punch list of items to be completed or corrected, endorsed and dated by the University. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and will be endorsed and dated by the University.
 4. Submit consent of surety to final payment.
 5. Submit a final liquidated damages settlement statement.
 6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection Procedure: The University will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the University.
1. Upon completion of reinspection, the University will prepare a certificate of final acceptance. If the Work is incomplete, the University will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated.

1.7 QUALITY ASSURANCE

- A. Maintenance Manual Preparation: In preparation of maintenance manuals, use personnel thoroughly trained and experienced in operation and maintenance of equipment or system involved.
1. Where maintenance manuals require written instructions, use personnel skilled in technical writing where necessary for communication of essential data.
 2. Where maintenance manuals require drawings or diagrams, use draftsmen capable of preparing drawings clearly in an understandable format.
- B. Instructions for the University's Personnel: Use experienced instructors thoroughly trained and experienced in operation and maintenance of equipment or system involved to instruct the University's operation and maintenance personnel.

1.8 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the University's reference during normal working hours.
- B. Record Drawings (As-Built):
1. Markup Procedure: During construction, maintain a set of blue- or black-line white prints of Contract Drawings and Shop Drawings for Project Record Document (As-Built) purposes.
 - a. Mark these Drawings to show the actual installation where the installation varies from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to, the following:
 - 1) Dimensional changes to the Drawings.
 - 2) Revisions to details shown on the Drawings.
 - 3) Revisions to routing of conduits.
 - 4) Revisions to electrical circuitry.
 - 5) Actual equipment locations.
 - 6) Locations of concealed internal utilities.
 - 7) Changes made by change order.
 - 8) Changes made following the University's written orders.
 - 9) Details not on original Contract Drawings.
 - b. Mark record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on

- Contract Drawings location.
- c. Mark record sets with red erasable colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - d. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - e. Note change-order numbers, and similar identification.
2. Responsibility for Markup: The individual or entity who obtained record data, whether the individual or entity is the Installer, subcontractor, or similar entity, shall prepare the markup on record drawings.
- a. Accurately record information in an understandable drawing technique.
 - b. Record data as soon as possible after obtaining it. Record and check the markup prior to enclosing concealed installations.
 - c. At time of Substantial Completion, submit record drawings to the University for the University's records. Organize into sets and bind and label sets for the University's continued use.

C. Record Specifications:

1. During the construction period, maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.
 - a. Mark the Specifications to indicate the actual installation where the installation varies from that indicated in Specifications and modifications issued. Note related project record drawing information, where applicable. Give particular attention to substitutions, selection of product options, and information on concealed installations that would be difficult to identify or measure and record later.
 - 1) In each Specification Section where products, materials, or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
 - 2) Record the name of the manufacturer, supplier, installer, and other information necessary to provide a record of selections made and to document coordination with record Product Data submittals and maintenance manuals.
 - 3) Note related record Product Data, where applicable. For each principal product specified, indicate whether record Product Data has been submitted in maintenance manual instead of submitted as record Product Data.
 - b. Upon completion of markup, submit record Specifications to the University.

- D. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
3. Upon completion of markup, submit three complete sets of record Product Data to the University for the University's records.

E. Miscellaneous Record Submittals:

1. Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the University for the University's records.
 - a. Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:
 - 1) Testing and qualification of tradesmen.
 - 2) Documented qualification of installation firms.
 - 3) Load and performance testing.
 - 4) Inspections and certifications by governing authorities
 - 5) Final inspection and correction procedures.

G. Operation and Maintenance Manuals:

1. Submittal Schedule: Comply with the following schedule for submitting operation and maintenance manuals:
 - a. Before Substantial Completion, when each installation that requires operation and maintenance manuals is nominally complete, submit 2 draft copies of each manual to the University for review. Include a complete index or table of contents of each manual.
 - 1) The University will return 1 copy of the draft with comments within 15 days of receipt.
 - b. Submit 1 copy of data in final form at least 15 days before final inspection. The University will return this copy within 15 days after final inspection, with comments.
 - c. After final inspection, make corrections or modifications to comply with the University's comments. Submit three (3) copies of each approved manual to the University within 15 days of receipt of the University's comments.
2. Form of Submittal: Prepare operation and maintenance manuals in the form of an instructional manual for use by the University's operating personnel. Organize into

suitable sets of manageable size. Where possible, assemble instructions for similar equipment into a single binder.

- a. Binders: For each manual, provide heavy-duty, commercial-quality, 3-ring, vinyl-covered, loose-leaf binders, in thickness (3 to 4 inch) necessary to accommodate contents, sized to receive 8-1/2-by-11- inch (115-by-280-mm) paper. Provide a clear plastic sleeve on the spine to hold labels describing contents. Provide pockets in the covers to receive folded sheets.
 - 1) Where 2 or more binders are necessary to accommodate data, correlate data in each binder into related groupings according to the Project Manual table of contents. Cross-reference other binders where necessary to provide essential information for proper operation or maintenance of the piece of equipment or system.
 - 2) Identify each binder on front and spine, with the printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter covered. Indicate volume number for multiple volume sets of manuals.
 - b. Dividers: Provide heavy paper dividers with celluloid-covered tabs for each separate Section. Mark each tab to indicate contents. Provide a typed description of the product and major parts of equipment included in the Section on each divider.
 - c. Protective Plastic Jackets: Provide protective, transparent, plastic jackets designed to enclose diagnostic software for computerized electronic equipment.
 - d. Text Material: Where maintenance manuals require written material, use the manufacturer's standard printed material. If manufacturer's standard printed material is not available, provide specially prepared data, neatly typewritten, on 8-1/2-by-11-inch (115-by-280-mm), 20-lb/sq. ft. (75-g/sq. m) white bond paper.
 - e. Drawings: Where maintenance manuals require drawings or diagrams, provide reinforced, punched binder tabs on drawings and bind in with text.
 - 1) Where oversize drawings are necessary, fold drawings to the same size as text pages and use as a foldout.
 - 2) If drawings are too large to be used practically as a foldout, place the drawing, neatly folded, in front or rear pocket of binder. Insert a typewritten page indicating drawing title, description of contents, and drawing location at the appropriate location in the manual.
3. Operation and Maintenance Manual Content:
- a. In each manual include information specified in the individual Specification Section and the following information for each major component of building equipment and its controls:
 - 1) General system or equipment description.
 - 2) Copies of applicable Shop Drawings and Product Data, including all Division 15 and Division 16 submittals.

- 3) System or equipment identification, including:
 - a) Name of manufacturer.
 - b) Model number.
 - c) Serial number of each component.
 - 4) Operating instructions.
 - 5) Emergency instructions.
 - 6) Wiring diagrams.
 - 7) Installation instructions.
 - 8) Inspection and test procedures.
 - 9) Maintenance procedures and schedules.
 - 10) Precautions against improper use and maintenance.
 - 11) Copies of warranties and completed UMB Warrantee Schedules.
 - 12) Repair instructions including spare parts listing.
 - 13) Sources of required maintenance materials and related services/repair and replacement parts.
 - 14) Manual index.
- b. Organize each manual into separate Sections for each piece of related equipment. As a minimum, each manual shall contain a title page; a table of contents; copies of Product Data, supplemented by Drawings and written text; and copies of each warranty, bond, and service contract issued.
- 1) Title Page: Provide a title page in a transparent, plastic envelope as the first sheet of each manual. Provide the following information:
 - a) Subject matter covered by the manual.
 - b) Name and address of the Project.
 - c) Date of submittal.
 - d) Name, address, and telephone number of the Contractor.
 - e) Name and address of the University.
 - f) Cross-reference to related systems in other sections of the operation and maintenance manual.
 - 2) Table of Contents: After title page, include a typewritten table of contents for each volume, arranged systematically according to the Project Manual format. Include a list of each product included, identified by product name or other appropriate identifying symbol and indexed to the content of the volume.
 - a) Where a system requires more than one volume to accommodate data, provide a comprehensive table of contents for all volumes in each volume of the set.
 - 3) General Information: Provide a general information Section immediately following table of contents, listing each product included in the manual, identified by product name.
 - a) Under each product, list the name, address, and telephone number of the subcontractor or Installer and the maintenance contractor.

- b) Clearly delineate the extent of responsibility of each of these entities. Include a local source for replacement parts and equipment.
- 4) Product Data: Where the manuals include manufacturer's standard printed data, include only sheets that are pertinent to the part or product installed.
 - a) Mark each sheet to identify each part or product included in the installation.
 - b) Where the Project includes more than one item in a tabular format, identify each item, using appropriate references from the Contract Documents.
 - c) Identify data that is applicable to the installation, and delete references to information that is not applicable.
- 5) Manufacturer's Information: For each manufacturer of a component part or piece of equipment, provide the following:
 - a) Printed operation and maintenance instructions.
 - b) Assembly drawings and diagrams required for maintenance.
 - c) List of items recommended to be stocked as spare parts.
- 6) Maintenance Procedures: Provide information detailing essential maintenance procedures, including the following:
 - a) Routine operations.
 - b) Troubleshooting guide.
 - c) Disassembly, repair, and reassembly.
 - d) Alignment, adjusting, and checking.
- 7) Operating Procedures: Provide information on equipment and system operating procedures, including the following:
 - a) Startup procedures.
 - b) Equipment or system break-in.
 - c) Routine and normal operating instructions.
 - d) Regulation and control procedures.
 - e) Instructions on stopping.
 - f) Shutdown and emergency instructions.
 - g) Summer and winter operating instructions.
 - h) Required sequences for electric or electronic systems.
 - i) Special operating instructions.
- 9) Controls: Provide a description of the sequence of operation and as-installed control diagrams by the control manufacturer for systems requiring controls.
- 12) Written Text: Prepare written text to provide necessary information where manufacturer's standard printed data is not available, and the information is necessary for proper operation and maintenance of

equipment or systems. Prepare written text where it is necessary to provide additional information or to supplement data included in the manual. Organize text in a consistent format under separate headings for different procedures. Where necessary, provide a logical sequence of instruction for each operation or maintenance procedure.

- 13) Drawings: Provide specially prepared drawings where necessary to supplement manufacturer's printed data to illustrate the relationship of component parts of equipment or systems or to provide control or flow diagrams. Coordinate these drawings with information contained in project record drawings to assure correct illustration of the completed installation.
 - a) Do not use original project record documents as part of operation and maintenance manuals.
- 15) Warranties, Bonds, and Service Contracts: Provide a copy of each warranty, bond, or service contract in the appropriate manual for the information of the University's operating personnel. Provide written data outlining procedures to follow in the event of product failure. List circumstances and conditions that would affect validity of warranty or bond.

H. Warranty Submittals:

1. Submit written warranties to the University prior to the date certified for Substantial Completion. If the University's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the University.
 - a. When a designated portion of the Work is completed and occupied or used by the University, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the University within 15 days of completion of that designated portion of the Work.
2. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the University, through the University, for approval prior to final execution.
3. Forms for special warranties are included at the end of this Section. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Submit a draft to the University, through the University, for approval prior to final execution.
 - a. Refer to Division 16 Sections for specific content requirements and particular requirements for submitting special warranties.

4. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
5. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.
 - a. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.
 - b. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor.
 - c. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.9 INSTRUCTIONS FOR THE UNIVERSITY'S PERSONNEL

- A. Prior to final inspection, instruct the University's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Provide instruction at mutually agreed upon times.
 1. For equipment that requires seasonal operation, provide similar instruction during other seasons.
 2. Use operation and maintenance manuals for each piece of equipment or system as the basis of instruction. Review contents in detail to explain all aspects of operation and maintenance.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the University's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Identification systems.
5. Control sequences.

6. Cleaning.
7. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

END OF SECTION

DIVISION 16 - ELECTRICAL SPECIFICATIONS

PART I – GENERAL REQUIREMENTS:

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including the General and supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE:

- A. The electrical contractor shall furnish all labor, material, tools, equipment and services necessary and incidental for installing all electrical systems shown on the drawings, indicated in the specifications, or necessary to provide a finished installation. The finished installation shall be in perfect working condition and be ready for continuous and satisfactory operation. The project area is located in: Penn Street Garage.

1.3 RESPONSIBILITY

- A. The general contractor shall be responsible for all work included in the Electrical Division. The delegation of work to subcontractors shall not relieve him of this responsibility. Subcontractors who perform work under these sections shall be responsible to the general contractor.

1.4 CODES & REGULATIONS:

- A. All materials furnished and all work installed shall comply with the latest rules, regulations, and recommendations of the following bodies:
 - 1. International Building Code
 - 2. International Mechanical Code
 - 3. National Electric Code
 - 4. Maryland State Health Department
 - 5. National Fire Protection Association
 - 6. Fire Prevention Bureau Baltimore City
 - 7. Fire Protection Bureau State of Maryland
 - 8. Underwriters Laboratories
 - 9. National Electrical Manufacturer Association
 - 10. National Electrical Testing Agency
 - 11. Insulated Power Cable Engineers Association

1.5 CONTRACT DOCUMENTS:

- A. Contract drawings for electrical work are diagrammatic, intended to convey scope and general arrangement.
- B. Correction of faulty work due to resolving discrepancies without authorization shall be the responsibility of the Contractor.
- C. Should the Contractor discover any discrepancies or omissions on the drawings or in the specifications, he shall notify the Engineer 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 Engineer.

1.6 SUBMITTALS:

A. General:

- 1. UMB requires that all submittals, which includes shop drawings, product data, related operation and maintenance manuals, warranty documentation and all other pertinent information be submitted electronically by the manufacturer, trade contractors, and construction manager as a “pdf” file including the UMB Standard Submittal Stamp Form and the UMB Standard Submittal Tracking Form for review as required by Division I. Partial submittals are not acceptable and will be returned without review. Also see Division 1 for requirements regarding operation & maintenance manual organization and review.
- 2. After contract award and before material is ordered submit electrically all shop drawings, drawings and such other descriptive data as the Engineer may require to demonstrate compliance with the contract documents as required by the contract clauses, plus the number required for himself and his subcontractors, for review and approval.
- 3. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable publication references, years of satisfactory service, and other information necessary to establish contract compliance of each item the Contractor proposes to furnish.
- 4. Submittals for Fire Stops and Smoke Seals required for the project shall be by the same manufacturer. Additional requirements shall be as indicated below:
 - a. Submittals for Fire Stops and Smoke Seals shall include a certification from the manufacturer that each submitted product complies with the local regulations controlling the use of volatile organic compounds (VOC's) and or non toxic to the building.

- b. These submittals shall also include data, diagrams and details showing the UL assemblies to be installed.
 - c. Engage a technician who has installation experience, using the approved materials, to provide training to the various trade personnel who will install the materials required for the project. Training period shall be for four (4) hours. Submit a Certificate of Training from the manufacturer of the material to the UMB Project Manager documenting the required training.
5. All electrical equipment shall be approved and listed by Underwriters' Laboratories (U.L.) and shall bear nameplate indicating same.
6. Submittals will be reviewed for general compliance with design concept in accordance with contract documents, but dimensions, quantities, or other details will not be verified.
7. Submittals shall include the following items:
- a. Raceway
 - b. Boxes and Enclosures
 - c. Wire and Cable
 - d. Grounding
 - e. Devices
 - f. Identification
 - g. Lighting
 - h. Lighting Controls
 - i. Fire Stops and Smoke Seals
 - j. Installer's Qualifications
 - k. Provide additional submittals for items identified on the contract drawings.
 - l. Operation & Maintenance Manuals
- 1.7 COORDINATION:
- A. Coordinate all work and cooperate with all other trades to facilitate execution of work.
- 1.8 SITE EXAMINATION:
- A. Failure to visit the site and become familiar with existing project conditions prior to bidding will not relieve the Contractor of responsibility for complying with the Contract Documents.
- 1.9 QUALITY ASSURANCE:

- A. **Manufacturer's Qualifications:** Firms regularly engaged in manufacture of electrical products, of types and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.
- B. **Installer's Qualifications:** Electrical Installer shall submit the following evidence:
 - 1. Contractor must submit an application to BGE *Smart Energy Saver* program and become and approved *Energy Solutions for Business Service Provider* prior to being awarded this contract.

1.10 WORK PERFORMANCE

- B. All electrical work must comply with the requirements of NFPA 70 (NEC), NFPA 70B, NFPA 70E, OSHA Part 1910 subpart J, OSHA Part 1910 subpart S and OSHA Part 1910 subpart K in addition to other references required by the contract.
- C. Before initiating any work, a job specific work plan must be developed by the contractor. The work plan must include procedures to be used on and near the live electrical equipment, barriers to be installed, and safety equipment to be used and exit pathways.
- D. Job site and worker safety are the responsibility of the contractor. Compliance with the requirements of NFPA 70E is subject to ongoing inspection by University personnel and failure to comply will result in an immediate Stop Work order being issued and enforced at the contractor's expense.
- E. Energized electrical conductors and circuit parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee performs work any time the employee is within the limited approach boundary or, where an increased risk of injury from an exposure to an arc flash hazard exists.
- F. Outages should be scheduled a minimum of ten (10) days in advance.
- G. **Mandatory Requirements:** The following requirements are mandatory:
 - 1. **Protective Equipment:** Electricians must use full protective equipment (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools, etc.) while working on energized systems in accordance with NFPA 70E.
 - 2. **UMB Energized Work Permit:** A UMB Energized Work Permit is required for any work on energized circuits or equipment. Permit must be approved by UMB Department of Operations and Maintenance prior to performing energized work. Submit the work permit with the outage request.

1.11 FIELD INSTRUCTION:

- A. Upon completion of work, instruct Owner's representative in the proper operation and maintenance of the electrical systems.

1.12 DEMOLITION:

- A. 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.
- B. 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.
- C. Provide temporary electrical service to equipment disturbed by the demolition until such time as the permanent service can be restored.
- D. 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.
- E. Exposed conduit to be demolished shall be removed in its entirety. Concealed conduit, abandoned in place, shall be cut out approximately two (2) inches beyond the face of adjacent construction, plugged, and the adjacent surface patched to match existing.
- F. 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.
- G. Equipment specified or indicated to be demolished, shall be removed from the project site and shall not be reused.

1.13 FIRE STOPS & SMOKE SEALS:

- A. Provide fire stops and smoke seals for all mechanical services installed and existing services in the project area that pass through fire rated partitions, wall, floors etc. Services shall include all ductwork, conduit, metal and plastic piping, cables, etc. The area around penetrations including any voids between them must be filled in and sealed with UL fire rated materials equal to the adjoining materials. All fire stop insulation devices and sealants shall maintain the fire resistance integrity of the floor, wall partition, etc. and meet ASTM 814-83 F&T rating for time, hours and temperature rise. All fire stopping and sealants shall allow for expansion and contraction movement without

pumping free of openings. Provide U. L. System Numbers in product submittals for each Fire Stop & Smoke Seal Application.

- B. The installer of firestop and smoke seal materials shall be a firm licensed or otherwise approved by the manufacturer of the materials and have at least five (5) years experience installing firestop and smoke seal materials. Installer shall comply with the material manufacturer's recommendations and installation requirements and ASTM and applicable code requirements.
- C. All fire stop and smoke seal materials shall be as manufactured by any one of the following manufacturers:
 - 1. Specified Technologies Inc. (STI)
 - 2. DOW Corning Corp.
 - 3. 3M Inc.
 - 4. Hilti

1.14 CUTTING AND PATCHING:

- A. Cutting and patching associated with the work in the existing structure shall be performed a neat and workmanlike manner. Existing surfaces that are damaged by the contractor shall be repaired or provided with new materials to match existing.
- B. Structural members shall not be cut or penetrated. Holes cut through concrete and/or masonry to accommodate new work shall be cut by reciprocating or rotary, non-percussive methods.
- C. Patching of areas disturbed by installation of new work and/or required demolition shall match existing adjacent surfaces as to material, texture and color.

1.15 OUTAGES:

- A. For all work requiring an outage, the contractor shall submit an outage request to the University of Maryland, Baltimore (UMB) Project Manager, using the UMB Standard Request for Outage Form which is available through the UMB Web Site at <http://www.umaryland.edu/designandconstruction/>, under the Documents Link. The existing mechanical/electrical systems shall remain operational unless turned off by University personnel during the construction of the project. For each electrical outage request include a photograph of the panel index schedule for each panel affected by the outage.
- 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 Office of Facilities Management. All such outages shall be performed on 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 at the convenience of the University.
- D. The operation of valves or switches; required to achieve an outage must be accomplished by University personnel only. Prospective subcontractors under this section are cautioned that the unauthorized operation of valves, power switches, or other control devices by their personnel can result in extremely serious consequences for which the contractor will be held accountable.
- E. The contractor shall advise the Office of Facilities Management ten (10) days in advance for all work requiring outages. The existing mechanical/electrical systems shall remain operational unless turned off by University personnel during the construction of the project.

1.16 SAMPLES:

- A. Samples of materials to be used on the work shall be submitted when requested and shall be subject to approval by the Engineer of Office of Facilities Management.

1.17 OPERATION AND MAINTENANCE MANUAL ELECTRONIC FILES:

- A. Electrical O & M Manual File: Provide one (1) electronic file “pdf format” for the projects Electrical Operation and Maintenance Manual for the Material and Equipment installed in the project included in Division 16 on a CD-R. The electronic Electrical O & M manual shall include one copy of each approved submittal, any manufacturer’s maintenance manuals, all warranty certificates, arranged in file folders for each submittal. Also include the address, phone number and contact person for each supplier. Files shall be stacked and include both a book mark and tree structure for accessing each submittal file as indicated in Division 1 Closeout Procedures.
- B. Alternate O & M File: The CM/General Contractor has the option to include all disciplines in a single O&M Manual file for smaller type renovation projects. The electronic O & M manual shall include one copy of each approved submittal, approved TAB report, any manufacturers maintenance manuals, all warranty certificates, arranged in file folders under each discipline for each submittal. Files shall be stacked and include both a book mark and tree structure for accessing each submittal file The electronic file structure for the single file shall be as follows:

- 1. Cover Sheet

2. Forward
3. General Information
4. Subcontractors List
5. Suppliers List
6. General Warranty Statement – include the manufacturer’s warranty with the equipment submittal in the appropriate discipline.
7. Architectural: group all architectural data under this heading with a tree structure.
8. Mechanical: group all mechanical data under this heading with a tree structure.
9. Electrical: group all electrical data under this heading with a tree structure.
10. Fire Protection: group all fire protection data under this heading with a tree structure.
11. As Built Drawings: Contractors Markups.

1.18 CLEAN – UP:

- A. Excessive debris and dirt, such as occurs from cutting through masonry or plaster walls shall be cleaned up from the equipment and removed immediately after the work of cutting through the walls.
- B. Debris shall be removed from UMB property.
- C. Ceiling panels shall be replaced as soon as work is finished in the area, and shall be kept free of dirty finger prints. Where work is being done in corridors used by patients and visitors, ceiling panels shall be replaced at the close of the days work even if work is at the particular location is incomplete.
- D. All areas shall be left broom-clean at the end of the work period.

1.19 IDENTIFICATION BADGES:

- A. Contractors must obtain photo identification cards for all employees who will be at the construction site. The University will charge the contractor \$25.00 for each badge as a deposit of which \$20.00 will be returned when the badge is returned. Lost photo I.D. card will cost \$25.00 for another replacement card. (The above charges are subject to change without notice.)

1.20 HAZARDOUS MATERIALS:

- A. Identification and removal of hazardous materials (asbestos, lead paint, PCBs) is not part of this contract. If questionable material is encountered, notify the University Project Manager and the University Environmental Health and Safety in writing immediately. The University shall then arrange for investigation and possible abatement of the material. Contractor shall schedule his work to accommodate hazardous material removal by the Owner.

1.21 GENERAL:

- A. General provisions of the contract apply. All work performed and materials provided shall conform to all applicable codes and standards and the National Electrical Code (NEC).
- B. Prior to starting work, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- C. Avoid interference with structure and with work of other trades, preserving adequate headroom and clearing all doors and passageways.
- D. Confirm the locations of all existing utilities. Repair any damage to existing utilities caused by construction forces.
- E. Leave all areas broom clean daily. Remove all construction debris and trash from the site daily.
- F. Before ordering any materials or equipment, submit to the engineer data for all materials and equipment. Check equipment dimensions of proposed substitute equipment. The cost of any redesigning caused by a substitution shall be borne by the Contractor.
- G. Contractor shall do all cutting, drilling and patching required by his work. All repairs to finish shall be of like kind, color and quality as existing. Structural members shall not be cut without approval from the architect.
- H. Provide temporary power as may be required for construction or as may be required to maintain critical operations during changeover of feeders or services. Provide all equipment, make all arrangements, and make all connections required for temporary power. Remove all provisions for temporary power upon completion of the project.
- I. Schedule in advance all outages of building utilities. Outages shall be as short as possible. All services shall be restored and placed in operation when Contractor's personnel leave the site each day.
- J. Take necessary precautions to protect building's occupants and contents, and prevent the spread of dust and dirt into occupied areas.
- K. Electrical contractor shall identify existing circuits and existing panels for the renovation area and trace and identify existing circuits. Identifying and tracing of the circuits shall be done with machinery and appropriate safety gear. Should an outage become necessary, it

will need to be requested a minimum of ten (10) working days in advance through the UMB Project Manager.

- L. Contractor shall update panel board circuit directory cards.

1.22 COMMISSIONING NEW ELECTRICAL SYSTEMS

- A. Summary: This section includes the requirements for commissioning electrical systems, assemblies and equipment related to the project area.
- B. Commissioning Agent (CxA): The CxA for the project shall be as assigned by UMB.
- C. Description: The following equipment and/or accessories shall be commissioned as part of this project:
 - 1. Lighting fixtures.
 - 2. Lighting Controls.

1.23 GUARANTEE/WARRANTEE:

- A. All materials, equipment, etc. provided by the general contractor and/or his subcontractors shall be guaranteed and warranted to be free from defects in workmanship and materials for a period of two (2) years from the date of substantial completion and acceptance of work by UMB. Any defects in workmanship, materials, or performance which appear within the guarantee period shall be corrected by the contractor without cost to the owner, within a reasonable time, to be specified by UMB. In default thereof, owner may have such work done and charge the cost of same to the contractor. In addition to the above statement the Guarantee/Warranty Period shall include all labor cost related to all warranty work. For compressorized equipment include an additional three (3) year Guarantee/Warranty Period. LED lighting fixtures and equipment include an additional five (5) year Guarantee/Warranty Period.
- 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.

PART II – PRODUCTS:

2.1 LISTED MANUFACTURERS:

- A. The manufacturers indicated in Part 2 represent the basis for design and identify the minimum level of quality for materials and equipment, specified in this section, that are acceptable to UMB. Unless otherwise indicated in this Section, contractors may submit material and equipment by non listed manufacturers provided said submittals meet the

requirements of these specifications. All submitted materials and equipment are subject to approval by the A/E and UMB.

2.2 RACEWAY:

- A. For indoors above floor slab, use EMT conduit with compression fittings with a minimum size of three quarter (3/4) inch (regardless of function/purpose) and maximum size of two (2) inches. Above two (2) inches, conduit shall be rigid steel conduit, zinc coated with threaded type fittings.
1. For low-voltage, special systems provide the following color-coated EMT raceway:
 - a. Fire Alarm - Red.
 - b. Telecommunications - Green.
 - c. Security - White.
- B. Non-Metallic Raceway: Provide expansion joints in every twenty (20) foot of run and at least once in every run in all outdoor, rooftop, and garage locations. Provide PVC 40 pipe, non-metallic NEMA 4X boxes and non-metallic NEMA 4X enclosures supported via non-metallic fiberglass strut and/or pipe clamps at the following locations:
1. All outdoor locations including, but not limited to, inside garages and on rooftops.
 2. Embedded in concrete, brick, CMU or other structural material.
 3. Below-slab and -grade.
 4. All unconditioned-air spaces/rooms in Parking Garages.
- C. Utilize PVC-Coated Rigid Galvanized Steel in exterior locations above grade where there is a potential for damage or below 8 feet in vehicle/cart traffic areas and where otherwise required by the NEC.
- D. Flexible Metal Conduit: Provide flexible metal conduit (liquidtight in outdoor or underfloor locations) for the following installations (consult the UMB Project Manager prior to using flexible metal conduit for any other locations):
1. Vibrating Equipment (motors, transformers, etc.) – Limited to the last 36 inches prior to termination.
 2. Embedded in CMU walls.
 3. Flexible connections to motors shall contain a 90 degree bend.
- E. Supports: For all indoor, conditioned-space locations utilize conduit clamps, conduit straps, bean clamps, etc. and/or channel strut supports. For all outdoor applications (as specified above for PVC 40) and where non-metallic raceway is provided, provide only non-metallic fiberglass (or other non-metallic material) or PVC-Coated Galvanized Steel

conduit supports and/or channel strut. Support conduits at a minimum of two (2) times per ten (10) ft. length and at a frequency rate as directed by the NEC.

- F. Bushings: Provide only threaded type for IMC, RGS and PVC-RGS raceway. Provide only steel compression type for all EMT raceway systems. Provide insulated-throat, threaded type bushings for all tel/data raceway systems.
- G. Surface metal raceways shall be used only in finished areas and only where specifically noted on the drawings. Raceway must be compatible with UMB's standard Ortronics and/or Siemens tel/data jacks and faceplates. Surface mounted raceways shall be Wiremold 500, 700, 1000, or 4000 series or pre-approved equivalent with buff finish used as follows:
1. # 500: 2-#10 or 3-#12 wires maximum.
 2. # 700: 3-#10 or 4-#12 wires maximum.
 3. #1000: 9-#10 or 12-#12 wires maximum.
 4. Other combinations of conductors shall be in accordance with the manufacturer's published data and the National Electrical Code.
 5. All elbows, boxes fittings supports, etc., shall be by the raceways manufacturer. Finish shall match that of the raceway.
 6. Wire trough shall be steel enclosed wireway meeting all U.L. requirements.
- H. All new raceways in finished areas shall be concealed unless specifically noted otherwise.
- I. Grout around all conduits at ceiling, floor, and wall penetrations to provide airtight seal. All floor slab and fire-rated wall penetrations shall be sealed with a rated system/installation that is pre-approved by the UMB Fire Marshal. Submit manufacturer's engineering drawing of the proposed fire-proofing system to the UMB Project Manager for approval.
- J. Group together exposed conduit insofar as possible. Install all conduits parallel or perpendicular to the building surfaces. Maintain minimum six (6) inch spacing from parallel flues, steam pipes, or hot water pipes and two (2) inches from perpendicular flues, steam or hot water pipes.
- K. All conduits shall be rigidly supported to building structure. Conduits shall not be supported from suspended ceiling support wires.
- L. All conduit bends shall be made with an approved conduit bender and no bend shall have a centerline radius less than six times the diameter of the conduit.
- M. Core Drilling/Floor Penetrations: Coordinate with the UMB Project Manager prior to making any core drills for floor penetrations. Prior to core drilling/floor penetrations

provide X-ray examination/GPD of the floor structure to locate structural steel for avoidance. The contractor is responsible for maintaining structural integrity of all floors and walls after core drills for conduits are made.

2.3 BOXES AND ENCLOSURES:

- A. Indoor Applications: Provide NEMA 250 interior galvanized steel, minimum 14 gauge, outlet boxes, no less than four (4) inches square with extension rings and mounting brackets at the following locations:
 - 1. Dry and Clean Locations: NEMA Type 1.
 - 2. Locations with Dust, Falling Dirt and Dripping Noncorrosive Liquids: NEMA Type 12.
 - 3. Mechanical and Electrical Rooms: NEMA Type 12.
- B. Outdoor Applications: Provide NEMA 4X non-metallic weatherproof boxes and enclosures supported via non-metallic fiberglass strut at the following locations:
 - 1. All outdoor locations including, but not limited to, inside garages and on rooftops
 - 2. Where raceway is embedded in concrete, brick, CMU or other structural material
 - 3. Below slab and grade.
 - 4. All unconditioned air spaces/rooms in Parking Garages.
- C. Outlet boxes shall be rigidly and securely fastened in place. Outlet boxes in finished areas shall be flush mounted unless otherwise noted.
- D. Boxes shall be sized in accordance with NEC Article 370.
- E. All conduit connectors and entry hubs shall be insulated or have insulated bushings.
- F. Outlets shown adjacent to one another on the plans at the same mounting height shall be ganged except where noted.
- G. Outlets shown adjacent to one another on the plans at different mounting heights shall be located with the upper outlet centered directly over the lower outlet.
- H. GEM Boxes – Recessed GEM Boxes are prohibited.

2.4 WIRE AND CABLE:

- A. All wire shall be copper with insulation rated at 600 volts, 75°C minimum. **Aluminum wire is strictly prohibited.**

- B. Minimum wire sizes shall be #12 for power wiring, #14 for control wiring and as specially noted for systems wiring.
- C. Wire shall be solid type THHN or THWN up to size 10 AWG and stranded type THWN, XHHW, or THHN for size 8 AWG and larger. (Unless noted otherwise.) Do not use "BX" type cable (unless directed otherwise in writing by UMB Project Manager). For high temperature equipment connections use type TFE wire. Unless directed otherwise, do not exceed 40% conduit fill.
- D. MC Cable - Type steel-clad MC cable with separate, isolated ground conductor (i.e. do not use the jacket for the ground conductor) may be used in concealed locations for lighting and receptacle circuits or as otherwise directed on the contract drawings. Individual conductor color-coding scheme must follow color-code scheme described below. For renovation projects, the application of MC Cable shall mirror the standards followed for the building's original electrical raceway system fit-out. Do NOT run MC Cable in exposed locations (e.g. all open ceiling locations, Mechanical and Electrical Equipment Rooms, IT Rooms, etc.).
- E. MC Cable Installation Requirements:
 - 1. Install in compliance with NFPA 70.
 - 2. Locations: In dry wall partitions and above accessible ceilings. Do not install in masonry partitions or walls.
 - 3. Independently support all MC Cable runs; do not piggy-back on plumbing/HVAC, lighting fixture, and/or ceiling grid supports.
 - 4. Do not bundle more than three (3) runs together for supporting purposes.
 - 5. MC cable shall be installed in a neat and orderly fashion using batwings type supports.
 - 6. Minimum bend radius shall be as recommended by the manufacturer.
 - 7. MC cable run to switches shall have a neutral conductor.
 - 8. Cable larger than #8AWG shall not be permitted.
 - 9. All acceptable homeruns from panels in electrical rooms shall be installed in EMT conduit to a junction box/wire trough outside electrical rooms in accessible ceiling of corridor.
 - 10. Homeruns from panelboard to junction box outside of electrical room: wire in EMT or IMC raceway.
 - 11. Do NOT run MC Cable in exposed locations (e.g. all open ceiling locations, Mechanical and Electrical Equipment Rooms, IT Rooms, etc.).
 - 12. MC cable shall be secured at intervals not exceeding six (6) feet and within twelve (12) inches of every outlet box or fitting. Luminaire whips may be six (6) feet maximum without support.

- F. Molded connectors (wire nuts) may be used for splicing size 10 AWG or smaller wires on lighting and receptacle circuits only. "Scotch Blocks" must be submitted for prior approval. All other wiring shall be spliced only with lugs and/or terminal blocks.
- G. Terminal lugs shall be mechanical clamp or compression type unless part of a circuit breaker or switch assembly.
- H. Special lugs may be required to accommodate conductor sizes shown on the drawings. Contractor shall verify lug requirements for all circuit breakers and equipment terminals and shall provide correct lugs as required.
- I. Pre-insulated crimp connectors and terminals shall be used on alarm wiring.
- J. Under no circumstances shall feeders be spliced and/or tapped.
- K. Lighting and receptacle branch circuit homeruns over one hundred (100) feet long shall be size 10 AWG minimum.
- L. Color code the entire power wiring system as follows:
 - 1. 120/208 Volt System
 - a. Phase A - black
 - b. Phase B - red
 - c. Phase C - blue
 - d. Neutral - white
 - e. Ground - green
 - 2. 277/480 Volt System
 - a. Phase A - brown
 - b. Phase B - orange
 - c. Phase C - yellow
 - d. Neutral - gray
 - e. Ground - green

2.5 GROUNDING:

- A. Provide a complete equipment safety ground system ("greenwire" ground) for the entire electrical system as required by Article 250 of the NEC, and as specified herein.
- B. Provide additional grounding as indicated on the plans.
- C. All grounding wire, lugs, jumpers and bus shall be copper.

- D. All feeder and branch circuits shall contain an equipment ground wire. No conduit or raceway of any kind or length shall be used as the equipment grounding conductor.
- E. Equipment grounding conductors and straps shall be sized in accordance with the NEC. Refer to feeder schedules for ground wire requirements which may exceed the NEC. All equipment grounding conductors shall be provided with green insulation equivalent to the insulation on the associated phase conductors.
- F. The equipment grounding system shall be installed so all metallic structures, enclosures, raceways, piping, systems, junction boxes, outlet boxes, cabinets, machine frames and portable equipment frames operate continuously at ground potential and provide a low impedance path for ground fault currents.
- G. Grounding conductors shall be continuous and no splicing shall be allowed.
- H. Receptacles shall be bonded to their outlet boxes with #12 copper straps.

2.6 DEVICES:

- A. All wiring devices shall be Specification Grade.
- B. The Contractor shall verify color, location and mounting height of all devices prior to installation.
- C. Receptacles shall be flush, duplex, grounding type, 20A, 2P, 3W, 125VAC, NEMA 5-20R straight blade, ivory nylon or high-strength thermoplastic material unless indicated as special purpose outlet. Receptacles shall be designed to accept standard two-wire parallel connector caps and shall grip both sides of the connector wire.
- D. Provide 0.04 inch thick satin finish, Type 302, stainless steel plates at all receptacle and switch outlets unless otherwise specified. Provide galvanized steel plates in unfinished spaces.
- E. Receptacles shall be mounted with the bottom of the receptacle 18 inches above the finished floor unless otherwise noted. Gang multiple outlets at one location under a single multi-gang cover plate.
- F. Receptacle Orientation:
 - 1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.
- G. Switches shall be vertically aligned with Thermostats, other wall switches, fire alarm devices with the top of the switch 48 inches above the finished floor unless otherwise

indicated. Notify engineer of any discrepancies before roughing in outlet and obtain a new location. Gang multiple switches at one location under a single multi-gang plate. Locate switches on strike side of door between six (6) inches and twelve (12) inches from edge of door frame.

- H. Device plates shall be fitted tight to the wall.
- I. Delay installation of device plates until painting is complete.
- J. Provide RED devices when supplied by emergency power. Coordinate with UMB Project Manager to confirm. For special type receptacles on emergency power, provide RED cover plate.

2.7 IDENTIFICATION:

- A. Coordinate names, abbreviations and other designations used in electrical work with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as recommended by manufacturers or as required for proper identification and operation/maintenance of electrical systems and equipment.
- B. Delay installation of identification until painting is complete.
- C. Comply with governing regulations and requests of governing authorities for identification of electrical work.
- D. Install engraved plastic-laminate nameplates on all switchboards, motor control centers, starters, panelboards, telephone cabinets, disconnect switches and other electrical boxes and cabinets installed under this contract (black letters on white background).
- E. Install engraved plastic-laminate nameplates at each protective device in all switchboards identifying circuit service (black letters on white background).
- F. Where electrical conduit is exposed, apply identification (e.g. noting voltage, service/signal type, emergency power, etc.) on conduit. Except as otherwise indicated, use permanent vinyl, self-adhering markers with black letters on orange background.
- G. Apply self-adhering vinyl or heat-shrink plastic cable/conductor identification markers on each cable and conductor in each box, enclosure or cabinet where wires of more than one circuit are present, except where another form of identification (such as color-coded conductors) is provided. Match identification with marking system used in panelboards, shop drawings and contract documents.
- H. Wherever reasonably required to ensure safe and efficient operation and maintenance of electrical systems and electrically connected mechanical systems, install self-adhesive

plastic signs with appropriate instructions or warnings. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for intended purposes.

- I. Install warning signs at the entrances to all rooms and spaces in which electrical conductors or equipment are installed (white letters on red background).
- J. All field installed control circuits shall have tubular sleeve-type wire markers at each end of the circuit and at all splice points. Wire markers shall be permanently stamped with a numbering system selected by the Contractor. The numbering system shall be thoroughly documented and provided to the Engineer.
- K. Each receptacle shall be neatly marked on the inside cover with indelible marker identifying the panel and breaker from which it is fed and durable markers or tag inside outlet box. This to ensure the correct covers are restored after room renovations and/or painting. In addition to marking circuit identification inside the cover, also provide laminated label with circuit number on device cover plates.
- L. Dymo (or equivalent) labels shall not be used.
- M. Ceiling Markers: Provide labels on ceiling grid for accessible electrical equipment that is installed above the ceiling.

2.8 LIGHTING:

- A. Provide LED lighting fixtures of the sizes, types and ratings indicated on the drawings and in the schedules. Fixtures shall be complete with housings, energy efficient lamps, lamps/drivers, lenses, louvers and reflectors. LED lighting fixtures scheduled on the drawings are found to offer products similar to the basis of design product, including performance, appearance, and quality. Listed equals must comply with minimum performance criteria. Additional documentation and calculations for LED lighting fixtures compliance should be made available upon request.
- B. Exit Signs:
 - 1. General Requirements for Exit Signs: Comply with UL 924; for, visibility, luminance, and lettering size, comply with authorities having jurisdiction. Provide RED color sign.
- C. LED Lighting Products:
 - 1. Luminaires:
 - a. Refer to Luminaire Schedule for specified parameters such as correlated

- color temperature (CCT) value(s), lumen output, efficiency, etc.
 - b. Products shall be fabricated to be Reduction of Hazardous Substances (RoHS) compliant.
 - c. Must maintain their warranted life while operating within the manufacturers' specified environmental parameters.
 - d. The lumen value specification listed in the Luminaire Schedule is a delivered lumen value specification. Products supplied shall deliver not less than the lumen value specified.
 - e. The lumen maintenance specification of any assembled LED based chip, array, module, driver, and luminaire combination shall be a minimum of L70, at fifty thousand (50,000) hours, as tested and measured in compliance with IES documents LM-79 and LM-80.
 - f. Except as otherwise stated in the Luminaire Schedule, the light source shall provide a minimum CRI of 80.
- 2. Acceptable Manufacturers:
 - a. Refer to the Luminaire Schedule.
- 3. Drivers: Listed and so labeled per UL 8750 and UL 1310, and shall meet or exceed the following general specification criteria:
 - a. Designed and tested to be compatible with the luminaire light source operating current, voltage, and output power requirements.
 - b. Inaudible above 27 dBA ambient sound level.
 - c. Designed, fabricated, and tested to operate at an input voltage of 120 – 277VAC, $\pm 10\%$, at 60 Hz, with no perceptible change in light source output.
 - d. Contribute less than 20% total harmonic distortion, operating at full rated load, and shall not exceed the maximum allowable THD requirements allowed per standard ANSI C82.11.
 - e. Provided with integral short circuit, open circuit, and overload protection.
 - f. Have an operating power factor ≥ 0.9 .
 - g. Limit conducted and radiated interference in compliance with FCC 47 CFR Part 15.
 - h. Housed in a UL compliant and listed enclosure, suitable for remote installation where required, and listed for installation within spaces used for environmental air (plenum), as defined in NFPA 70 – the National Electrical Code.
 - i. Acceptable Manufacturers:
 - 1) Cree.
 - 2) EldoLED.
 - 3) Philips/Advance.

- 4) Thomas Research Products.
 - 5) Or as supplied by the luminaire manufacturer, in compliance with these Specifications.
4. Dimmable Drivers - In addition to the general specification criteria specified above:
- a. Have an operating power factor of ≥ 0.9 at full load, and not less than 0.8 at dimmed level.
 - b. Provide smooth, flicker-free, dimmable light output from 100% to less than 1%.
 - c. 0-10VDC "sinking" type dimming control protocol per enforced version of IEC Standard 60929, unless otherwise noted or required.
 - d. Acceptable Manufacturers:
 - 1) Cree.
 - 2) EldoLED.
 - 3) Philips/Advance.
 - 4) Thomas Research Products.
 - 5) Or as supplied by the luminaire manufacturer, in compliance with these Specifications.
- D. Fixtures shall be secured to structural supports and shall not rely on ceiling systems for support. Pendant fixtures shall be plumb and level. Pendant mounted fixtures, larger than two (2) feet shall be installed with two (2) stem hangers. Stem hangers shall have ball aligners and provisions for minimum one inch vertical adjustment. Plaster frames shall be provided for all recessed fixtures, installed in other than a suspended access ceiling system.
- E. Surface mounted fixtures greater than two (2) feet in length shall be supported from at least one point in addition to the fixture outlet box stud.
- F. Lighting Control: Provide lighting control as directed on the contract drawings.

PART III – EXECUTION:

3.1 TESTING:

- A. Thoroughly clean the electrical equipment and associated electrical materials before energization of any part of the electrical system. It is the Contractor's responsibility to have all the electrical equipment, raceways, cabling, cable insulation and other related electrical systems tested. All test results shall be recorded, dated and submitted to the Engineer and Owner for record. Test procedures and results shall be per NETA standards. In the absence of relevant NETA standards, the Contractor shall substitute appropriate

test procedures from IEEE or ANSI. The substitute test procedures shall be submitted to the engineer for approval before conducting the tests.

B. During the course of and after completion of installation, the Engineer shall:

1. Inspect the installation, workmanship, testing and operation of key electrical systems.

C. The Contractor shall verify that each key system interfaces correctly with all related systems. The Contractor shall furnish all test data to the Engineer verifying that all systems have been installed correctly and work together to provide a completely operational electrical power system as designed.

D. The Engineer reserves the right to accept or reject test data which does not conform to the manufacturer's data or is not obtained in accordance with these specifications.

3.2 COMMISSIONING NEW ELECTRICAL SYSTEMS

A. Testing Preparation:

1. Certify in writing to the CxA that electrical systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.

2. Place systems, subsystems, and equipment into operating mode to be tested.

3. Inspect and verify the position of each device and interlock identified on checklists.

4. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

B. General Testing Requirements:

1. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.

2. Scope of electrical testing shall include lighting controls and power riser inspections.

3. Test all operating modes and verify proper response of controllers and sensors.

4. The CxA along with the lighting contractor shall prepare detailed testing plans, procedures, and checklists for applicable new lighting systems, subsystems, and equipment.

5. Tests will be performed using design conditions whenever possible.
6. Electrical Equipment: Includes new lighting.
 - a. Verify that all new equipment has been installed in accordance with the manufactures recommendations and all equipment can be easily accessed for maintenance and operates as intended.
 - b. Verify that all new connections, controls, and accessories have been installed correctly and operates as intended.
 - c. Verify that all new equipment test, training, and startup procedures have been completed per the specifications.
 - d. Verify that all required new interfaces with for Life Safety the BAS have been installed correctly and operates as intended.
 - e. Operate new equipment as intended to ensure the design conditions can be obtained.

END OF DIVISION 16