

Roof Replacement
H. Temple Spears
1515 Cypress Street
Proposal # 1533

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SECTION 01 1000 - SUMMARY

PART 1 - GENERAL

1.1 PROJECT INFORMATION

- A. Roof Replacement H. Temple Spears Apartments.
 - 1. 1515 Cyprus Street, Louisville, Kentucky 40210
- B. Owner: Louisville Metro Housing Authority, 420 South Eighth Street, Louisville, Kentucky 40203.
- C. Architect: Lockett & Associates, Architects and Engineers, 153 Thierman Lane, Louisville, Kentucky 40207-5000.
- D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Construction Documents.
 - 1. Kerr-Greulich Engineers, Inc.
1534 Ormsby Station Court
Louisville, Kentucky 40223
D. Scott Setliffe, (502) 813-7700
Mechanical and Electrical
 - 2. TriEco, LLC.
10331 Linn Station Road
Louisville, KY 40223
Suzanne Arnzen, (502) 489-0850
Abatement
- E. The Work consists of:
 - 1. Salvage refrigerant from affected rooftop units for future reuse.
 - 2. Disconnect and relocate affected rooftop units. Store or dispose of units in accordance with drawings. Coordinate relocation with reroofing.
 - 3. Repair damaged parapet masonry.
 - 4. Prepare existing roofs and roof perimeters for installation of new roofing, flashing, blocking, and drainage. Spud gravel surfaces to prepare for new work. Remove flashing and metal trim where being superseded by new flashing, blocking, and trim. Rebuild roof tapers to match the planes at the north and south corners of the upper roof.
 - 5. Install substrate board, insulation, blocking, new TPO roofing, TPO flashing, and new cap flashing. Install new gutters, downspouts, and splash blocks where required.
 - 6. Reinstall, connect, and recharge rooftop mechanical units. Coordinate reinstallation with reroofing.
 - 7. Install roof-access ladder as indicated.

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1.2 WORK RESTRICTIONS

- A. Contractor's Use of Premises: During construction, Contractor will have limited use of area indicated.
 - 1. Contractor's use of premises is limited by Owner's right to perform work or employ other contractors on portions of Project.
 - 2. Tenants will occupy buildings during entire construction period. Perform the Work so as to minimize interference with Tenants' day-to-day operations.
- B. On-Site Work Hours: Limit work to normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday. Other hours and days by specific authorization of the Owner.
- C. Nonsmoking Building: Smoking is not permitted within the buildings or within 25 feet of entrances, operable windows, or outdoor-air intakes.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 1000

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SECTION 01 2500-SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section.

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Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

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1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- b. Requested substitution provides sustainable design characteristics that specified product provided.
- c. Substitution request is fully documented and properly submitted.
- d. Requested substitution will not adversely affect Contractor's construction schedule.
- e. Requested substitution has received necessary approvals of authorities having jurisdiction.
- f. Requested substitution is compatible with other portions of the Work.
- g. Requested substitution has been coordinated with other portions of the Work.
- h. Requested substitution provides specified warranty.
- i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Architect.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include

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compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

- b. Requested substitution does not require extensive revisions to the Contract Documents.
- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Requested substitution provides sustainable design characteristics that specified product provided.
- e. Substitution request is fully documented and properly submitted.
- f. Requested substitution will not adversely affect Contractor's construction schedule.
- g. Requested substitution has received necessary approvals of authorities having jurisdiction.
- h. Requested substitution is compatible with other portions of the Work.
- i. Requested substitution has been coordinated with other portions of the Work.
- j. Requested substitution provides specified warranty.
- k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2500

SECTION 01 2600 - CONTRACT 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 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect.

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- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining 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 the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 01 2500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use form acceptable to Architect.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2600

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SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 PROJECT MANAGEMENT AND COORDINATION

- A. Subcontract List: Submit a written summary identifying individuals or firms proposed for each portion of the Work
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. List e-mail addresses and telephone numbers.
- C. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the work.
- D. Requests for Information (RFIs): On discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI.

1.2 PROJECT MEETINGS

- A. General: Owner shall designate time and place for Project Meetings.
 - 1. Attendees: Contactor to require attendance of each subcontractor or other entity concerned with current progress or involved in planning, coordination, or performance of future activities.
 - 2. Decisions, instructions, and interpretations given by the Owner or his representative at these meetings shall be binding and conclusive on the Contractor
 - 3. Minutes: Proceedings of these meetings will be recorded and Contractor will be furnished one copy for his use. Contractor shall distribute copies to everyone concerned.
- B. Preconstruction Conference: Contractor shall be present and accompanied by his project coordinator, job superintendent, and all major subcontractors including testing agencies.
- C. Progress Meetings: Contractor, subcontractors, material men, and vendors whose presence is necessary or requested must attend meeting when called by the Owner or his representatives for the purpose of discussing execution of work.
 - 1. Progress Meetings shall be bi-weekly.
 - 2. Contractor shall be prepared to discuss construction schedule

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1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 1. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 2. Submit four copies of each action submittal. Architect will return two copies.
 - 3. Submit two copies of each informational submittal. Architect will not return copies.
 - 4. Architect will discard submittals received from sources other than Contractor.
- C. Paper Submittals: Place a permanent label or title block on each submittal for identification. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect. Include the following information on the label:
 - 1. Project name.
 - 2. Date.
 - 3. Name and address of Contractor.
 - 4. Name and address of subcontractor or supplier.
 - 5. Number and title of appropriate Specification Section.
- D. Identify options requiring selection by Architect.
- E. Identify deviations from the Contract Documents on submittals.
- F. Contractor's Construction Schedule Submittal Procedure:
 - 1. Submit required submittals in the following format:
 - a. Two paper copies.
 - 2. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 3. Coordinate Contractor's construction schedule with the schedule of values submittal schedule, progress reports, payment requests, and other required schedules and reports.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. Submit four paper copies of each submittal unless otherwise indicated. Architect will return two copies.

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- B. Product Data: Mark each copy to show applicable products and options. Include the following:
 - 1. Manufacturer's written recommendations, product specifications, and installation instructions.
 - 2. Wiring diagrams showing factory-installed wiring.
 - 3. Printed performance curves and operational range diagrams.
 - 4. Testing by recognized testing agency.
 - 5. Compliance with specified standards and requirements.

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data. Submit on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches. Include the following:
 - 1. Dimensions and identification of products.
 - 2. Fabrication and installation drawings and roughing-in and setting diagrams.
 - 3. Wiring diagrams showing field-installed wiring.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.

- D. Samples: Submit Samples for review of kind, color, pattern, and texture and for a comparison of these characteristics between submittal and actual component as delivered and installed. Include name of manufacturer and product name on label.
 - 1. If variation is inherent in material or product, submit at least three sets of paired units that show variations.

2.2 INFORMATIONAL SUBMITTALS

- A. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
- B. Qualification Data: Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type schedule within 5 days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

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- C. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
- D. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and indicate date by which recovery will be accomplished.

PART 3 - EXECUTION

3.1 SUBMITTAL REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Architect will review each action submittal, make marks to indicate corrections or modifications required, will stamp each submittal with an action stamp, and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

3.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Updating: At bi-monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribute copies of approved schedule to Owner, Architect, subcontractors, testing and inspecting agencies, and parties identified by Contractor with a need-to-know schedule responsibility. When revisions are made, distribute updated schedules to the same parties.

END OF SECTION 01 3000

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SECTION 01 4200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 4200

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SECTION 01 6000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- B. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced.
 - 1. Show compliance with requirements for comparable product requests.
 - 2. Architect will review the proposed product and notify Contractor of its acceptance or rejection.
- C. Basis-of-Design Product Specification Submittal: Show compliance with requirements.
- D. Compatibility of Options: If Contractor is given option of selecting between two or more products, select product compatible with products previously selected.
- E. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Deliver products to Project site in manufacturer's original sealed container or packaging, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 3. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 - 4. Store materials in a manner that will not endanger Project structure.
 - 5. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- F. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

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PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. Provide products that comply with the Contract Documents, are undamaged, and, unless otherwise indicated, are new at the time of installation.
1. Provide products complete with accessories, trim, finish, and other devices and components needed for a complete installation and the intended use and effect.
 2. Where products are accompanied by the term "as selected," Architect will make selection.
 3. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Where the following headings are used to list products or manufacturers, the Contractor's options for product selection are as follows:
1. Products:
 - a. Where requirements include "one of the following," provide one of the products listed that complies with requirements.
 - b. Where requirements do not include "one of the following," provide one of the products listed that complies with requirements or a comparable product.
 2. Manufacturers:
 - a. Where requirements include "one of the following," provide a product that complies with requirements by one of the listed manufacturers.
 - b. Where requirements do not include "one of the following," provide a product that complies with requirements by one of the listed manufacturers or another manufacturer.
- C. Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 6000

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SECTION 01 7000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 EXECUTION REQUIREMENTS

A. Cutting and Patching:

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities.

- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.2 CLOSEOUT SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

- B. Certified List of Incomplete Items: Final submittal at Final Completion.

- C. Operation and Maintenance Data: Submit one copy of manual.

- D. PDF Electronic File: Assemble manual into a composite electronically indexed file. Submit on digital media.

- E. Record Drawings: Submit one set(s) of marked-up record prints.

- F. Record Product Data: Submit one paper copy of each submittal.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

- A. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.

- B. Submittals Prior to Substantial Completion: Before requesting Substantial Completion inspection, complete the following:

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1. Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other sections, including project record documents, operation and maintenance manuals, final certifications, and similar documents.
- C. Procedures Prior to Substantial Completion: Before requesting Substantial Completion inspection, complete the following:
1. Complete startup and testing of systems and equipment.
 2. Perform preventive maintenance on equipment used prior to Substantial Completion.
 3. Remove temporary facilities and controls.
 4. Complete final cleaning requirements, including touchup painting.
 5. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will proceed with inspection or advise Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued.

1.4 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting inspection for determining final completion, complete the following:
1. Submit a final Application for Payment.
 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare final Certificate for Payment after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

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PART 2 - PRODUCTS

2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
- B. Cleaning Agents: Use cleaning materials and agents recommended by 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.

2.2 OPERATION AND MAINTENANCE DOCUMENTATION

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.

2.3 RECORD DRAWINGS

- A. Record Prints: Maintain a set of prints of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued. Mark to show actual installation where installation varies from that shown originally. Accurately record information in an acceptable drawing technique.
 - 1. Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Verify compatibility with and suitability of substrates.
 - 2. Examine roughing-in for mechanical and electrical systems.
 - 3. Examine walls, floors, and roofs for suitable conditions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Take field measurements as required to fit the Work properly. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication.

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- D. Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.2 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 3. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations.
- C. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- D. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
- E. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- F. Use products, cleaners, and installation materials that are not considered hazardous.

3.3 CUTTING AND PATCHING

- A. Provide temporary support of work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- D. Cutting: Cut in-place construction using methods least likely to damage elements retained or adjoining construction.
 - 1. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

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- E. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
 - 1. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - 2. Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance.
 - 3. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - 4. Provide full room replacement floor tile in Basement tenant rooms with new tiles to match existing color and pattern.
 - 5. Replace flooring in common spaces with tiles matching existing tiles to remain in color and pattern. Coordinate with Owner to determine if there is sufficient "attic stock" available.

3.4 CLEANING

- A. Clean Project site and work areas daily, including common areas. Dispose of materials lawfully.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 - 3. Remove debris from concealed spaces before enclosing the space.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion:
 - 1. Clean Project site, yard, and grounds, in areas disturbed by construction activities. Sweep paved areas; remove stains, spills, and foreign deposits. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - 2. Sweep paved areas broom clean. Remove spills, stains, and other foreign deposits.
 - 3. Remove labels that are not permanent.
 - 4. Clean transparent materials, including mirrors. Remove excess glazing compounds.
 - 5. Clean exposed finishes to a dust-free condition, free of stains, films, and foreign substances. Sweep concrete floors broom clean.
 - 6. Vacuum carpeted surfaces and wax resilient flooring.
 - 7. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and foreign substances. Clean plumbing fixtures. Clean light fixtures, lamps, globes, and reflectors.
 - 8. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

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3.5 OPERATION AND MAINTENANCE MANUAL PREPARATION

- A. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- B. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are unavailable and where the information is necessary for proper operation and maintenance of equipment or systems.
- C. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams.

3.6 DEMONSTRATION AND TRAINING

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system. Include a detailed review of the following:
 - 1. Include instruction for basis of system design and operational requirements, review of documentation, emergency procedures, operations, adjustments, troubleshooting, maintenance, and repairs.

END OF SECTION 01 7000

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SECTION 01 7419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Action Submittals:

1. Waste Management Plan: Submit plan within ten days of date established for commencement of the Work.

B. Informational Submittals:

1. Recycling and Processing Facility Records: Manifests, weight tickets, receipts, and invoices.
2. Landfill and Incinerator Disposal Records: Manifests, weight tickets, receipts, and invoices.
3. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations.

C. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

D. Waste Management Conference: Conduct conference at Project site to review methods and procedures related to waste management.

E. Waste Management Plan: Develop a waste management plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

1. Salvaged Materials for Reuse: Identify materials that will be salvaged and reused.
2. Salvaged Materials for Sale: Identify materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: Identify materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total nonhazardous solid waste generated by the Work.

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Clean salvaged items and install salvaged items to comply with installation requirements for new materials and equipment.
- B. Salvaged Items for Sale: Not permitted on Project site.
- C. Salvaged Items for Owner's Use: Clean salvaged items and store in a secure area until delivery to Owner.
- D. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs.
- E. Lighting Fixtures: Separate lamps by type and protect from breakage.

3.3 RECYCLING WASTE

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.

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3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

C. Metals: Separate metals by type.

D. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

E. Conduit: Reduce conduit to straight lengths and store by type and size.

3.4 DISPOSAL OF WASTE

A. Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

B. Do not burn waste materials.

END OF SECTION 01 7419

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SECTION 02 4119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

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1.5 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property , for environmental protection , for dust control and , for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of stairs.
- C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- D. Predemolition Photographs or Video: Submit before Work begins.
- E. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.7 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- D. Storage or sale of removed items or materials on-site is not permitted.

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- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
 - 2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
1. Arrange to shut off indicated utilities with utility companies.
 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Comply with requirements for access and protection specified in Section 01 5000 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 5000 "Temporary Facilities and Controls."

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 5. Maintain adequate ventilation when using cutting torches.
 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 9. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 7419 "Construction Waste Management and Disposal."
- B. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable,

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protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 01 7419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 4119

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SECTION 02 8213 – ASBESTOS ABATEMENT

TECHNICAL SPECIFICATION FOR THE REMOVAL OF ASBESTOS CONTAINING MATERIALS

TEMPLE SPEARS
1500 CYPRESS STREET
LOUISVILLE, JEFFERSON CO., KENTUCKY

Pre-Renovation Asbestos Containing Materials Abatement Louisville, Jefferson County, Kentucky

PART 1: GENERAL

1.01 WORK INCLUDED

- A. Furnish all labor, materials, services, insurance, appliances, permits, patents, decontamination facilities, and equipment in accordance with the most stringent requirements of the U.S. Environmental Protection Agency (EPA), the U.S. Occupational Safety and Health Administration (OSHA), these specifications, and all other applicable regulatory agencies to complete asbestos containing materials (ACM) abatement at 1500 Cypress Street in Louisville, Jefferson County, Kentucky prior to the renovation of the structure.
- B. Full and/or partial enclosure methods of removal shall be employed, as deemed suitable by the consultant and the Owner, to ensure safe abatement of the asbestos. These methods are described herein.
- C. Removal of the following listed asbestos containing materials prior to the scheduled building demolition. **No asbestos containing materials are to remain in the scheduled work areas.**

ASBESTOS CONTAINING MATERIALS

ITEM	MATERIAL	APPROX QUANTITY*	LOCATION/NOTES
1	Auditorium Roof – Building B	25 LF	Gray Square Vent Flashing
2	Low Level Roof – Building B	10 SF	Black Tar on Brick
3	High Level Roof – Building A	80 SF	Black Tar on Red Air Handlers

**All quantities of materials to be abated are approximate and must be field verified by the abatement contractor*

- D. The designated locations of asbestos materials removal will be further defined during the pre-bid meeting and site walk. The Contractor shall be responsible for verifying all quantities of asbestos containing materials and locations of removal of the defined asbestos containing materials by performing a thorough site inspection prior to commencing work, including the obtaining of permits. The Owner and its representatives will not be held responsible for additional work caused by the Contractor not performing a thorough site inspection.

- E. This specification is not intended to describe nor illustrate the material, labor and equipment necessary to perform the work. These documents represent the Owner's and Owner's Representative's best estimate of the quantity of the defined ACM to be removed during this project. It is the responsibility of the Contractor to determine the precise linear footage and square footage of the defined ACM for bidding purposes. No extra compensation will be allowed for differences between the best estimate and actual quantities of material to be removed. Additionally, the inspection report and this specification are considered complete, and the collection of additional samples of materials not included within the original report (if any) will be completed by the owner's representative. The collection of samples for the purposes of demonstrating materials previously analyzed and demonstrated or assumed to be positive as non-asbestos containing is prohibited.
- F. Bidders shall inform themselves of the conditions under which the work is to be performed at the work-site and all obstacles which may be encountered during the work. Bidders shall also inform themselves of all other relevant matters concerning the work to be performed, and, the bidder, if awarded the contract, shall not be allowed any extra compensation by reason of any matter or thing concerning which the bidder might have fully informed themselves, but failed to do so prior to bidding.
- G. Work in all Areas shall be accomplished with workmen wearing respiratory protection that will ensure a fiber level of less than one fiber per 100 cubic centimeters of air inside the mask. Decontamination chambers will be required. Sealing off spaces with plastic and curtained doorways, airlocks, etc., will be required in work areas. Additionally, due to the age of the structure, lead-based paints are known to exist on the subject property. The Contractor must perform all abatement and subsequent renovation activities in accordance with applicable local, state, and federal regulations including, but not limited to, OSHA regulations. (OSHA lead construction standard 29 CFR 1926.62).
- H. Clearance and area air samples will be conducted by the Owner's representative as further discussed within this specification. This does *not* alleviate the contractor from performing all applicable OSHA personnel monitoring. All sampling results conducted by the Contractor must be provided to the Owner and the Owner's Consultant at frequent intervals throughout the project (no more than 72 hours after occurrence of sampling activities) as required by OSHA and any other applicable regulations.
- I. The Owner's Consultant reserves the right to discontinue the method of removal should just reason be shown through air testing or visual inspection that the Contractor's performance of these procedures is unsafe.

1.02 COORDINATION

- A. It is the Contractor's responsibility to ensure that the asbestos abatement work, described within this section, is completed prior to the performance of any other work of this contract that would otherwise disturb or potentially disturb asbestos containing materials or contaminated surfaces.

- B. The Contractor will be required to coordinate with the Owner, Owner's Consultant and other on-site contractors with regard to project related details including, but not limited to, safety issues, scheduling, timing, site access, and priority of abatement activities.
- C. The Contractor shall notify the landfill in advance of dumping to allow an area to be set aside for the wastes. The Contractor shall provide to the Owner's Consultant certification that the landfill is an approved asbestos waste depository.
- D. The Contractor shall meet or exceed all requirements required by federal, state, and local law and regulations. The contractor shall submit to the Owner's Consultant proof of possession of a current Kentucky asbestos license, in good standing, to perform asbestos related work issued by state regulatory agencies.
- E. The Contractor must receive written "Notice to proceed" for abatement from the Owner and the Owner's Consultant. This notice will be provided at the Pre-abatement conference if all matters are in order.

1.03 DEFINITIONS

Aggressive method - means removal or disturbance of building material by sanding, abrading, grinding or other method that breaks, crumbles, or disintegrates intact ACM.

Air Monitoring Professional – Contractor selected representative not affiliated with abatement firm who will perform third party air monitoring and document project related activities.

Amended water - means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

Asbestos - includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered. For purposes of this standard, "asbestos" includes PACM, as defined below.

Asbestos-containing material (ACM) - means any material containing more than one percent asbestos.

Assistant Secretary - the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

Authorized person - any person authorized by the employer and required by work duties to be present in regulated areas.

Building/facility owner - is the legal entity, including a lessee, which exercises control over management and record keeping functions relating to a building and/or facility in which activities covered by this standard take place.

Certified Industrial Hygienist (CIH) – one who is certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

Class I asbestos work - activities involving the removal of TSI and surfacing ACM and PACM.

Class II asbestos work - activities involving the removal of ACM, which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

Class III asbestos work - repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed.

Class IV asbestos work - maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.

Clean room - an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

Closely resemble - the major workplace conditions, which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.

Competent person - in addition to the definition in 29 CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f): in addition, for Class I and Class II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR part 763) for supervisor, or its equivalent and, for Class III and Class IV work, who is trained in a manner consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92 (a)(2).

Contractor – for the purposes of this document means the firm that will be performing asbestos abatement activities

Critical barrier - one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

Decontamination area - an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition - the wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Director - the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

Disturbance - activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.

Employee exposure - exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

Equipment room (change room) - a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Fiber - a particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.

Glovebag - not more than a 60x 60-inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

High-efficiency particulate air (HEPA) filter - a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

Homogeneous area - an area of surfacing material or thermal system insulation that is uniform in color and texture.

Industrial hygienist - a professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards.

Intact - ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

LF - linear feet of thermal system insulation or other ACM

Micron – unit of measure equal to one millionth of a meter (1 meter = 39.37 inches)

Modification - a changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system. Omitting a procedure or component, or reducing or diminishing the stringency or strength of a material or component of the control system is not a "modification" for purposes of this section.

Negative Initial Exposure Assessment - a demonstration by the employer, which complies with the criteria in paragraph 29 CFR 1926.1101(f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PELs.

NESHAP - National Emissions Standards for Hazardous Air Pollutants

NIOSH - National Institute for Occupational Safety and Health

OSHA - Occupational Safety and Health Administration

Permissible exposure limits (PELS):

(1) *Time-weighted average limit (TWA)*. The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter of air as an eight (8) hour time-weighted average (TWA), as determined by the method prescribed in 29 CFR 1926.1101 Appendix A, or by an equivalent method.

(2) *Excursion limit*. The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes, as determined by the method prescribed in Appendix A to this section, or by an equivalent method.

PACM - "presumed asbestos containing material".

Presumed Asbestos Containing Material - thermal system insulation and surfacing material found in buildings constructed no later than 1980.

Project Designer - a person who has successfully completed the training requirements for an abatement project designer established by 40 U.S.C. 763.90(g).

Regulated area - an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit.

Removal - all operations where ACM and/or PACM is taken out or stripped from structures or substrates, and includes demolition operations.

Renovation - the modifying of any existing structure, or portion thereof.

Repair - overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

SF - Square feet, which are units of measure for area

Standard For Air Clearance - 0.01 fibers per cubic centimeter of air (f/cc) for asbestos under an aggressive environment

Surfacing material - material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

Surfacing ACM - surfacing material, which contains more than 1% asbestos.

Thermal system insulation (TSI) - ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.

Thermal system insulation ACM - is thermal system insulation, which contains more than 1% asbestos.

USEPA - United States Environmental Protection Agency

WSR- Waste Shipment Records

Work Areas - Areas where asbestos containing or contaminated materials are scheduled for removal

1.04 DISPOSAL SITES

- A. The asbestos materials and associated debris removed must be disposed of at an asbestos approved sanitary landfill. The Contractor selected for the work must make appropriate arrangements for disposal based on the notification requirements listed in subparagraph 1.07. The Contractor must also submit to the Owner and Owner's Consultant documentation stating the location of the disposed ACM in the landfill (degrees and minutes or sketch).

1.05 QUALITY ASSURANCE and ABATEMENT CONTRACTOR RESPONSIBILITY

- A. All asbestos removal and related work shall be accomplished by a Contractor specializing in, and having a record of, not less than two years successful experience in asbestos removal and related work. The Contractor's superintendent shall have not less than one year of full-time experience in responsible charge of asbestos removal operations within the 24-month period preceding the start of this project. The training of the superintendent and all workers shall be in compliance with current local (Louisville, Jefferson County, Kentucky), state (Kentucky Division for Air Quality), and federal (EPA/OSHA) regulations. The Abatement Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State and Local regulations related to any and all aspects of the abatement project. The contractor is responsible for providing and maintaining training and personal protective equipment as required by applicable Federal, state and local regulations. The Abatement Contractor shall hold the LMHA harmless for any failure of the Contractor to comply with any applicable abatement work, transporting, disposal, safety, health and environmental regulation /requirement on the part of himself, his employees, or his subcontractors. In the event of non/friable asbestos disturbance, the Abatement Contractor will incur all costs of the Consultant's Industrial Hygienist (IH) and Certified Industrial Hygienist (CIH), including all corrective abatement, sampling /analytical, and disposal costs to assure compliance with OSHA/EPA/State requirements.

- B. Additionally, the Contractor must be acceptable to the Louisville Metro Air Pollution Control District (LMAPCD) as a qualified contractor in good standing.

1.06 REGULATORY REQUIREMENTS

- A. All work shall be in strict compliance with the current issues of federal, state and local regulations, codes and standards including, but not limited to:

1. Asbestos/Lead Regulations:

- a. LMAPCD asbestos regulations;
- b. U.S. Environmental Protection Agency (EPA) Regulations for Asbestos (Code of Federal Regulations Title 40, Part 61, Sub-Part M);
- c. U.S. EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP);
- d. Title 40, Code of Federal Regulations, Part 763, Asbestos;
- e. U.S. Department of Labor Occupational Safety and Health Administration (OSHA) Asbestos Regulations (Code of Federal Regulations Title 29, Part 1926, Section 1926.1101);
- f. Title 29, Code of Federal Regulations, Section 1910.1001. OSHA, U.S. Department of Labor;
- g. Title 29 CFR 1926 - Construction Standard Requirements - Demolition Work;
- h. Title 29 CFR 1910.38(a);(b) - Emergency Action Plan;
- i. Title 29 CFR 1910.132 - Personal Protective Equipment;
- j. Title 29 CFR 1910.20 - Access to Employee Exposure and Medical Records;
- k. Title 29 CFR 1910.1200 - Hazard Communication;
- l. Title 29 CFR 1910.151 - Medical and First Aid;
- m. Title 29, Code of Federal Regulations, Section 1910.134. OSHA Respiratory Protection Standards;
- n. Section 6, Toxic Substance Control Act (TSCA);

- o. Title 29, Section 1910.1000, Occupational Safety and Health Standards;
- p. Title 29, Section 1910.120, Hazardous Waste Operations and Emergency Response;
- q. American National Standard Institute (ANSI) Publications: Z9.2-79 Fundamentals Governing the Design and Operation of Local Exhaust Systems;
- r. ANSI Publications: Z88.2-80 Practices for Respiratory Protection;
- s. Hazard Communication - Title 29, Part 1910, Section 1200 of the Code of Federal Regulations;
- t. Title 29, Code of Federal Regulations Section 1926.59, Construction Industry Standard for Hazard Communication;
- u. Title 40 CFR 61 Subpart A and M (Revised Subpart B) - National Emission Standard for Hazardous Air Pollutants – Asbestos;
- v. Title 40 CFR 763 - Asbestos Hazard Emergency Response Act (AHERA) and Asbestos School Hazard Abatement Reauthorization Act (ASHARA);
- w. Specifications for Accident Prevention Signs and Tags - Title 29, Part 1910, Section 145 of the Code of Federal Regulations;
- x. U.S. Department of Transportation (DOT), included, but not limited to: Hazardous Substance - Title 49, Part 171 and 172 of the Codes of Federal Regulations;
- y. All attachments, memorandums and information sheets submitted by Federal, State and Local agencies; and
- z. All State, County, and City codes and ordinances as applicable. Provide one copy of EPA, OSHA, State, and City Regulations governing the work available for review at the site.

2.Asbestos Guidance Documents:

- a. Asbestos-Containing Materials in School Buildings: A Guidance Document, Part 1. Office of Toxic Substances, U.S. EPA, Washington, D.C. 1979;

- b. Asbestos-Containing Materials in School Buildings: A Guidance Document, Part 2. Office of Toxic Substances, U.S. EPA, Washington, D.C. 1979;
- c. Guidance for Controlling Friable Asbestos-Containing Materials in Buildings: Washington, D.C. Office of Pesticides and Toxic Substances, U.S. EPA. 1983;
- d. Guidance for Controlling Asbestos-Containing Materials in Buildings: Washington, D.C. Office of Pesticides and Toxic Substances, U.S. EPA. 1985;
- e. Measuring Airborne Asbestos Following an Abatement Action: Washington, D. C., Office of Pesticides and Toxic Substances, U.S. EPA. 1985;
- f. Asbestos Waste Management/Guidance: Generation, Transport, and Disposal: Washington, D.C., Office of Solid Waste, U.S. EPA. 1985;
- g. Notification of Regulated Waste Activity. Office of Solid Waste (OS-312), Washington, D.C., U.S. EPA. 1990;
- h. ANSI - American National Standards Institute, ANSI Z 9.2, Fundamentals Governing the Design and Operation of Local Exhaust Systems; and
- i. NEC - National Electric Code. Any Work involving electrical equipment in a facility shall be performed in strict accordance with the National Electric Code.

1.07 SUBMITTALS

A. Meeting and Site walkover

1. At the time of notice to proceed, the Owner and Owner's Consultant will schedule a meeting at the subject property to discuss the project and allow the selected contractor to conduct a site walk over for the purposes of the pending asbestos abatement.
2. Prior to the site walkover, the Owner's Consultant will supply the LMAPCD with appropriate documentation and laboratory results to identify and quantify ACM to be abated within the structure and other suspect materials indicating non-ACM results. It remains the responsibility of the Contractor to verify all quantities and locations for removal by performing a thorough site inspection prior to commencing work, including the obtaining of permits. The Owner and

its representatives will not be held responsible for additional work caused by the Contractor not performing a thorough site inspection.

B. Documents

The selected contractor will supply the following documentation not fewer than ten (10) business days prior to commencement of work to the Owner for the Owner's Consultant's review:

1. Copies of documentation, permits, site location, completed and signed landfill letter (subparagraph 1.14) and arrangements for transport and disposal of asbestos containing or contaminated materials. Submit certification that proposed landfill site to be used meets all appropriate regulatory requirements.
2. A copy of the employers Emergency Action Plan including, but not limited to, emergency planning for consideration of asbestos exposure, fire, explosion, hazardous atmospheres, electrical hazards, slips/trips and falls, confined spaces, and heat stress illness, as needed. Written procedures for response to anticipated emergency situations shall be developed. Emergency procedures shall be in written form and prominently posted. All personnel must be trained prior to entering regulated areas in these procedures and sign that they understand the emergency procedures.
3. The Abatement Contractor shall apply for and have on-site all required permits and licenses to perform abatement work as required by Federal, State, and Local regulations.
4. Written description, sketch or combination thereof, of the plans for construction of a worker and barrier/equipment decontamination enclosure system and for isolation of the work areas in compliance with the Contract Documents and all applicable regulations.
5. Project specific asbestos abatement work procedures or practices to be utilized (Contractor's Work Plan).
6. Contractor's proof of experience with projects of this scope of work. A listing of asbestos abatement supervisory personnel (including foremen) and their experience, qualifications and training.
7. Individually signed and Notarized "Certificates of Workers Acknowledgment Forms" (subparagraph 1.13) for all workers intended for this project.
8. Individual documentation of the most recent respirator fit test (within previous six months) for each type of respiratory protection for each worker

intended for this project. Physician's documentation that the worker is medically capable of wearing a respirator must also be submitted.

9. Product data and Safety Data Sheets (SDS) for any equipment or materials to be used.
10. Manufacturer's specifications for air cleaning, vacuum equipment, and air handling equipment, as well as any special tools or safety equipment to be utilized on this Project.
11. Medical exams, worker release forms, asbestos training certification forms, and respirator training documentation of all employees performing asbestos abatement on the Project. As new employees are considered for work at the project site, submit the above for those employees prior (minimum of two working days prior) to entry at the project.
12. A copy of all required Asbestos Contractor and Contractor personnel licenses required by the Louisville Metro Air Pollution Control District, and the Kentucky Division for Air Quality.
13. Certificates of Insurance showing evidence of Workers' Compensation, Liability Insurance, and Asbestos Liability Insurance coverage.
14. Descriptions of any asbestos hazard abatement activities conducted that have been prematurely terminated, including the circumstances surrounding the termination.
15. Descriptions of any asbestos hazard abatement activities conducted that have been prematurely terminated, including the circumstances surrounding the termination.
16. A list of any contractual penalties that the Contractor has paid for breach of or noncompliance with Contract Specifications for asbestos hazard abatement activities, such as overruns of completion time or liquidated damages.
17. Identification of any citations levied against the Contractor by any Federal, State, or local government agencies for violations related to asbestos hazard abatement, including the name or location of the project, the date(s), and how the allegations were resolved.
18. A description, in detail, of all legal proceedings, lawsuits, or claims that have been filed or levied against the Contractor or any of the Contractor's past or present employees for asbestos-related activities, and how the allegations were resolved.

NOTE: If any or all of Submittals 14 through 18 do not apply, the Contractor shall provide a written statement expressing the same.

19. Provide estimated schedule for complete abatement activities. Provide breakdown by work area, including, at a minimum, the number of man-hours anticipated, number of days, and any assumptions.
20. Provide a total cost estimate for completion of abatement activities. Provide breakdown by work area and include unit rates for contingency purposes.

C. Pre-Job Commencement Activities and Post Contract Award

1. Submit written notice of impending commencement of removal of ACM work at least twenty (20) business days prior to project commencement to:

Louisville Metro Air Pollution Control District
701 West Ormsby Ave. #303
Louisville, Kentucky 40203

Comply with the applicable notice procedures set forth in EPA 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants; Appendix A to Subpart M of Part 61 – Interpretive Rule Governing Roof Removal Operations; Asbestos NESHAP Revision. Provide to the Owner and Owner’s Consultant one copy of the notifications along with a Certified Mail Receipt (or equivalent) indicating the delivery of Notification to aforementioned agencies.

2. Upon receipt and review of LMAPCD Permit, provide copies to Owner and Owner’s Consultant.
3. Conduct an additional pre-abatement meeting with Owner and Owner’s Consultant to review LMAPCD Permit and project scope-of-work prior to commencement.

D. Post-Job Submittals

The selected contractor will supply the following documentation, during the project and/or following completion of the work, to the Owner and the Owner’s Consultant’s for review:

1. Asbestos waste log showing date, type of container removed from work area, signature of recorder, time of day, waste shipment records (WSRs), and a sketch or written description of the location of the waste material in the landfill.
2. Hazardous materials waste log showing date, type of container removed from work area, signature of recorder, time of day, waste shipment records

(WSRs), and a sketch or written description of the location of the waste materials in the landfill and/or documentation showing proof of recycling.

3. A copy of the asbestos materials abatement Sign In/Out Log showing the following: date, name, last four digits of social security number, entering and leaving time, company or agency represented and reason for entry for all persons entering the controlled areas.
4. An alphabetical listing of asbestos abatement employees used on the Project and exact dates on which each employee was present in asbestos abatement work areas.
5. A copy of asbestos abatement area and employee air monitoring results relative to this section and to OSHA respiratory protection level compliance. This must be provided within one (1) working day following onsite monitoring to the Owner's Consultant.
6. Static pressure (monometer) readings collected throughout the project. This must be provided on a weekly basis to the Owner's Consultant.
7. The Contractor is responsible for submitting the Post-Job Submittal items to the Owner's Consultant within thirty days of project completion.

1.08 DELIVERY AND STORAGE

- A. Coordinate with Owner and the Owner's Consultant to identify size of storage area required and location on site.
- B. Deliver materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name. SDS shall be required for all materials brought on site by the Contractor.
- C. Store material subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.
- D. Remove from the premises all damaged or deteriorating materials. Dispose of materials that become contaminated with asbestos in accordance with applicable regulatory standards.

1.09 GENERAL PROTECTION OF PERSONS

- A. Prior to commencement of work all workers shall be instructed and shall be knowledgeable in appropriate procedures of personnel protection during asbestos materials removal.
- B. Contractor shall be solely responsible for enforcing worker protection requirements.
- C. Contractor shall provide workers with personally issued and marked respiratory equipment approved by NIOSH and meeting specifications of OSHA. This respiratory equipment shall be suitable for the asbestos exposure level in the work areas according to OSHA Standard 29 CFR 1926.1101. Provide disposable HEPA filters as required, with sufficient filters for replacement.
- D. Contractor shall provide workers, the Owner, the Owner's Consultant and authorized visitors with sets of protective disposable clothing, head covers, gloves, eye protection and foot covers of sizes to properly fit individual workers and visitors whenever they are required to enter the work area. Provide a minimum of four sets per day for visitors and sufficient sets as required for workers and the Owner's Consultant. Eye protection, full body harness and lanyard, steel toe safety shoes and hard hats shall be provided as required by applicable safety regulations. Non-disposable protective clothing and footwear shall be left in the contaminated equipment room until the end of the abatement work, at which time such items shall be properly disposed.
- E. In addition, due to the age of the structure, it is possible that painted surfaces contain lead-based paints. The Contractor must perform all abatement and subsequent demolition activities in accordance with applicable local, state, and federal regulations including OSHA regulations. (OSHA lead construction standard 29 CFR 1926.62)
- G. Reporting Unusual Events: When an event of unusual and significant nature occurs at the site, prepare and submit a special report listing chain of events, persons participating, response and similar pertinent information. When such events are known or predictable in advance, advise the Owner's Consultant in advance, at the earliest possible date.
- H. Reporting Accidents: Prepare and submit reports of significant accidents at site and anywhere else work is in progress. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained.
- I. Post telephone numbers and locations of emergency services including, but not limited to, fire, ambulance and police at the entrance to the decontamination unit.

1.10 SIGN IN/OUT LOG

- A. Contractor shall maintain a sign in/out log in the immediate vicinity of the change room of any decontamination area. Log shall be maintained from the time the first activity is performed involving the disturbance of asbestos containing materials until acceptance of the final air test results and removal of the enclosure. All persons entering the controlled area, including the Contractor's workers, Air Monitoring Professional, Owner and Government Officials shall be

required to sign in and out each time upon entering and leaving the work area. All persons shall indicate name, time, company or agency represented and reason for entering the containment area.

- B. Except for Governmental Inspectors having jurisdiction, no visitors shall be allowed in any controlled area, except as authorized by the Owner or Owner's Consultant.

1.11 SAFETY PROTECTION and OSHA COMPLIANCE

- A. The Contractor warrants that he is familiar with the codes and requirements applicable to asbestos materials abatement work and demolition activities and shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the work. If the Contractor observes that the specifications or plans are at variance therewith, he shall give written notice to the Owner via the Owner's Consultant describing such variance. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without written notice to the Owner/Owner's Consultant, he shall bear all costs arising there from.

The Contractor's particular attention is directed to the "Safety and Health Regulations for Construction" and subsequent amendments promulgated by the Department of Labor identified as Chapter XVII of Title 29, Code of Federal Regulations (CFR), Part 1926 and the necessity of complying with the regulations in the progress of his work. Failure or omission on the part of the Owner, Owner's Consultant or any of their representatives either to discover or to bring to the attention of the Contractor shall not be used as defense for failure on his part to fulfill such requirements.

- B. The Contractor shall have a job superintendent present at all times work of this contract is in progress.
 - 1. Superintendent shall be thoroughly familiar and experienced with asbestos removal and related work and shall be familiar with and enforce the use of all safety procedures guidelines. Proof of superintendent's qualifications shall be available upon request.
 - a. Proof of this instruction shall also be provided to the Owner and Consultant prior to the pre-abatement conference.
 - 2. In addition to the superintendent, Contractor shall furnish one or more foreman (a minimum of one foreman per work area being abated at any one time) who are familiar and experienced with asbestos removal and its related work, safety procedures, and equipment. Foreman shall have a minimum of AHERA accredited supervisory training in the removal of asbestos from a recognized school or university, and applicable certification from the Kentucky Division for Air Quality.

- a. Proof of foreman's experience shall be provided to the Owner and Consultant prior to the pre-abatement conference.
3. It shall be required that the superintendent and/or one or more foreman be inside each work area at all times work is in progress and that either of them be outside the work area at all times or available to authorize persons outside the work area.
4. All workers shall be duly certified and/or accredited according to Kentucky Department for Air Quality Regulations. No workers will be allowed on the job site without prior verification by the Consultant of these accreditations/certifications.

1.12 SPECIFIC PROTECTION OF WORKERS

A. Exposure assessments and monitoring

1. General Monitoring Criteria:

- a. All exposure and personnel monitoring is the responsibility of the Contractor.
- b. Appropriate and required monitoring associated with the removal of hazardous materials is the responsibility of the Contractor.
- c. The Contractor who has a workplace or work operation where exposure monitoring is required under this section shall perform monitoring to determine accurately the airborne concentrations of asbestos to which workers may be exposed.
- d. Determinations of employee exposure shall be made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each worker.
- e. Representative 8-hour TWA worker exposure shall be determined on the basis of one or more samples representing full-shift exposure for workers in each work area. Representative 30-minute short-term worker exposures shall be determined on the basis of one or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit for workers in each work area.
- f. The Owner shall employ an independent air monitoring consultant for outside work area air monitoring and clearance testing if deemed necessary.

- g. The use of an Owner furnished air monitoring consultant to conduct the specified clearance testing and ambient area monitoring does not relieve the Contractor of his responsibility for providing tests required by codes, regulations, and standards for the protection and safety of his employees and for any other purpose.
- h. Copies of all test results by the Contractor testing laboratory shall be provided to the Owner without cost. Contractor shall be provided, by the air monitoring consultant, copies of all air monitoring and clearance test results without cost.

2. Initial Exposure Assessment:

- a. The Contractor who has a workplace or work operation covered by this standard shall ensure that a "competent person" conducts an exposure assessment immediately before or at the initiation of the operation to ascertain expected exposures during that operation or workplace. The assessment must be completed in time to comply with requirements which are triggered by exposure data or the lack of a "negative exposure assessment," and to provide information necessary to assure that all control systems planned are appropriate for that operation and will work properly.
- b. Basis of Initial Exposure Assessment: Unless a negative exposure assessment has been made, the initial exposure assessment shall, if feasible, be based on monitoring conducted pursuant to paragraph (c) of General Monitoring Criteria. The assessment shall take into consideration the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the employer which indicate the levels of airborne asbestos likely to be encountered on the job. For Class I asbestos work, until the Contractor conducts exposure monitoring and documents that workers on that job will not be exposed in excess of the PELs, or otherwise makes a negative exposure assessment, the worker shall presume that workers are exposed in excess of the TWA and excursion limit.

3. Negative Exposure Assessment

- a. 29 CFR 1926.1101 states for any one specific asbestos job which will be performed by workers who have been trained in compliance with the standard, the Contractor may demonstrate that worker exposures will be below the PELs by data which conform to the following criteria;

- i. Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the TWA and excursion limit under those work conditions having the greatest potential for releasing asbestos; or
 - ii. Where the Contractor has monitored prior asbestos jobs for the PEL and the excursion limit within 12 months of the current or projected job, the monitoring and analysis were performed in compliance with the asbestos standard in effect; and the data were obtained during work operations conducted under workplace conditions "closely resembling" the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations, the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job, and these data show that under the conditions prevailing and which will prevail in the current workplace there is a high degree of certainty that worker exposures will not exceed the TWA and excursion limit; or
 - iii. The results of initial exposure monitoring of the current job made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee covering operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.
- B. The Contractor shall provide workers with approved respirators, as listed below. Non-disposable half-mask respirators with HEPA filters will be considered the minimum acceptable equipment for asbestos abatement and may only be used during controlled area preparation involving Class 1 (TSI or Surfacing) removal. Powered Air Purifying Respirators will be considered the minimum acceptable equipment during Class 1 ACM removal process, if Class 1 removal is being performed. The Contractor shall also provide a sufficient quantity of filters approved for asbestos work so that workers can change filters during the workday. Filters shall not be used any longer than one (1) work day or after they have been wetted in decontamination shower or until they become clogged by particles during work activities. The respirator filters may be stored at the job site but shall be totally protected from exposure to asbestos prior to their use.

1. Respirator Requirements:	<u>MAXIMUM ALLOWABLE FIBER CONCENTRATIONS</u>
- Half Mask with HEPA Cartridge	<0.5 f/cc
- Full Mask with HEPA Cartridge	<1.0 f/cc
- Powered Air Purifying Respirator (PAPR) with HEPA Cartridge	<2.5 f/cc
- Full Face Supplied Air Operating in Continuous Flow Mode	<10.0 f/cc
- Full Face Supplied Air Operating Positive Pressure Mode	<100.0 f/cc
- Full Face Supplied Air Operating in Positive Pressure Mode with Auxiliary Self-Contained Breathing Apparatus	>100.0 f/cc

C. In all ACM Removal Areas

1. Workers shall always wear a respirator properly fitted on the face while in the removal areas. Workers wearing tight-fitting face pieces shall be clean-shaven to the extent that the hair does not interfere with the sealing surface of the respirator. This must be documented by a standard respirator fit test.
2. The Contractor shall instruct and train workers in proper respirator use.
3. Workers shall wear disposable, full-body cover-alls and disposable head covers and footwear suitable for asbestos work in the removal areas.
4. Workers shall not eat, drink, smoke, chew gum and/or apply cosmetics in the removal areas.
5. The Contractor shall provide a fit tested respirator and disposable cover-alls, head cover, and footwear to any official representative of the Owner or Owner's Consultant who inspects the project.
6. All persons entering the removal areas shall wear an approved respirator and disposable cover-alls, head cover and footwear.
7. The Contractor shall instruct and train workers in the nature of asbestos, and the hazards related to asbestos exposure during abatement work.
8. The Contractor shall set up a decontamination unit consisting of separate male and female change rooms, shower and equipment room, enclosed and separated by triple-flap polyethylene air locks, connected to the controlled areas. This shall be done in accordance with OSHA Regulations 29 CFR 1926.1101. All workers, without exception, shall:

- a. Remove and properly store street clothes in the change room and put on new disposable cover-alls, head covers, footwear and cleaned respirators before entering the decontamination chamber entrance to the work area.
 - b. Remove gross contamination from clothing before leaving the work area. Remove the disposable cover-alls, head covers and footwear in the equipment room and dispose of them in an appropriate waste container. Still wearing their respirators, workers shall proceed naked to the shower and clean the respirator with soap and water while showering; remove their respirators while thoroughly showering with soap and tempered water. Wetted HEPA respirator cartridges shall be disposed of in appropriate containers. The inside of the respirator face piece should be washed and rinsed. Water from the shower shall be filtered with an acceptable asbestos filtering system prior to discharge to the sewer
 - c. Following showering and drying off, each worker and authorized visitor shall proceed directly to the clean change room and dress in clean clothes at the end of each day's work, or before eating or drinking.
 - d. This procedure shall be followed each time a worker enters or leaves the work area.
 - e. Contaminated work footwear shall be stored in the equipment room when not in use in the work area. After the asbestos abatement process is completed, footwear shall be disposed of as contaminated waste or cleaned thoroughly inside and out with soap and water before being removed from the work area.
 - f. Workers shall be fully protected with respirators and protective clothing immediately prior to the first disturbance of asbestos or contaminated material, and until final cleanup is completed and approved.
9. The Contractor shall set up an equipment decontamination unit consisting of a washroom, constituting an airlock, with a curtained doorway to a designated area of the work area and a curtained doorway to the holding area. This area shall be the same as the equipment room in the worker decontamination enclosure system. The washroom wastewater shall be drained, collected, and filtered through a system with at least 5 to 10 micron particle size collection capability. **NOTE:** A system containing a series of several filters with progressively smaller pore sizes is recommended to avoid rapid clogging of filtration system by large particles. All expended filters shall be discarded as contaminated waste. Filtered

water may be discharged to a sanitary or storm sewer drain. This shall be done in accordance with OSHA Regulations 29 CFR 1926.1101. All workers, without exception, shall:

- a. Remove waste containers from the equipment decontamination enclosure by entering the holding area from outside wearing a respirator and dressed in clean coveralls. Workers shall not use this system as a means to leave or enter the work area.
- b. Clean external surfaces of contaminated containers and equipment thoroughly by wet mopping, or using a HEPA-filtered vacuum before moving such items into the decontamination enclosure system washroom for final cleaning and removal to uncontaminated areas. Ensure that personnel do not leave work areas through the equipment decontamination enclosure system.

1.13 CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____
DATE _____
PROJECT ADDRESS _____
CONTRACTOR'S NAME _____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF DISEASES. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP AN ASBESTOS RELATED DISEASE IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use. You will be trained in safe work practices and in the use of the equipment found on the job. You will receive a medical examination. These things are to have been done at no cost to you. By signing this certificate, you are assuring the Owner that your employer has met these obligations to you.

RESPIRATOR PROTECTION: I have been trained in the proper use of respirators, and informed of the type respirator to be used on the above-referenced project. I have a copy of the written respiratory protection manual issued by my employer. I have been equipped, at no cost, with the respirator to be used on the above project.

TRAINING COURSE: I have been trained in the dangers inherent in handling asbestos and breathing asbestos fibers and in proper work procedures, and personal and area protective measures. The topics covered in the course included the following:

- physical characteristics of asbestos
- health hazards associated with asbestos
- respiratory protection
- negative air systems
- work practices including hands-on or on-job training
- personal decontamination procedures
- air monitoring, personnel and area

MEDICAL EXAMINATION: I have had a medical examination within the past 12-months, which was paid for by employer. This examination included: health history, pulmonary function tests, and may have included an evaluation of chest X-ray. I have been notified of the results of my examination.

Signature _____
Printed Name _____
Social Security Number ***-**-**** _____
Witness _____

1.14 LANDFILL LETTER

Date

[Name of Disposal Facility]

RE: [PROJECT NAME] ("Project Site")

Dear Sir/Madam:

In accordance with the requirements of the environmental insurance policy, we must verify certain basic factual information concerning facilities to which wastes or other materials are delivered. Therefore, before material is delivered to [Name of Facility] (the "Facility"), we need to confirm the following:

1. The Facility has received and reviewed the following documents regarding characterization of the soil/waste at the [Project Name] to be delivered to the Facility.

[list documents here or attach copies of relevant data tables or laboratory results]

2. Based upon the documentation described in the above paragraph, the Facility will accept soil/waste for purposes of:

- _Disposal
- _Treatment
- _Daily Cover
- _Recycling
- _Other (explain below)

3. The Facility is operating under valid permits, licenses, and other regulatory approvals which allow the Facility to lawfully accept the soil/waste for the purposes stated above.
4. The Facility is not insolvent or in bankruptcy.
5. The Facility is not subject to any action under CERCLA or a similar state action.
6. The Facility has never been listed and is not currently listed on the federal National Priorities List (NPL) or any state superfund list.
7. The Facility will promptly notify Louisville Metro Housing Authority in writing if any of circumstances 2 through 6 change during the time that soil/waste from project site is being delivered to the Facility. Such notification will be made to me at the above-referenced address via first class mail.

If statements 2 through 7 above are true and accurate, please acknowledge by signing and dating the Acknowledgment following my signature on this page and return to me in the stamped, self-addressed envelope. Again, we are unable to deliver any material to the Facility until such time as this acknowledgment is received, so please return it at your earliest convenience.

Very truly,

ACKNOWLEDGED AND AGREED:

Date

Name and Title

[Signature of a Corporate Officer or Manager of the Facility]

cc: Bernard Pincus, Louisville Metro Housing Authority
Norma Ward, Louisville Metro Housing Authority
Suzanne Amzen, TriEco

PART 2: PRODUCTS

2.01 MATERIAL

- A. 6-mil Polyethylene sheets in sizes to minimize the frequency of joints.
- B. Tape: Glass fiber or other type capable of sealing joints of adjacent plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials under both dry and wet conditions.
- C. Surfactant (Wetting Agent): Shall consist of materials, which are non-toxic and non-irritating to skin and eyes, and non carcinogenic. The wetting agent shall be 50-percent polyoxyethylene ester and 50-percent polyoxyethylene ether (AQUA-GRO), or equivalent, in a concentration of one (1) ounce in five (5) gallons of water.
- D. Sealant: For substrates other than structural steel, the following products have been accepted for use in asbestos removal areas:
 - 1. American Coating Corporation - Cable Coating No. 22P.
 - 2. Arpin Engineering, Inc. - Asbestite 2000.
 - 3. H. B. Fuller Co., Foster Products Division - Protektor 32-22.
 - 4. Matheson Chemical Corporation - Dust-Set Asbestos Encapsulant.
 - 5. National Cellulose Corporation - SK-13.
- E. Impermeable Containers: Air and water-tight, suitable to receive and retain any asbestos containing or contaminated materials until disposal at an approved site, and labeled in accordance with OSHA Regulation 29 CFR 1910.1001 and 29 CFR 1926.1101, as well as EPA regulation 40 CFR Part 61 (asbestos), 29 CFR 1910.145, and 49 CFR 171, 172, 173, 178 and 179. Two types of impermeable containers shall be used:
 - 1. Six mil plastic bags sized to fill within the drum.
 - 2. Metal or fiber drums with tightly fitting lids.
- F. Warning Labels and Signs: In conformance with OSHA regulation 29 CFR 1926.1101 (asbestos), DOT regulation 49 CFR 171, 172, 173, 178 and 179 Regulations for Labeling, Mailing and Transporting Hazardous Waste, EPA regulation 40 CFR 260, 261, 262, 263, 264 and 265 Hazardous Waste Regulations, and EPA regulation 40 CFR, Part 61, Subpart M.
- G. Other Materials: Provide all other materials, such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the controlled area.

- H. Air Purifying Equipment: Equipped with HEPA filters for pulling fresh air from the building, through the decontamination chamber, into the containment area where asbestos fibers are becoming airborne during removal, through the HEPA filters where 99.97 percent of asbestos fibers greater than 0.3 microns in length are removed and exhausted to the atmosphere outside the building. No air movement system or air filtering equipment shall discharge unfiltered air outside the enclosure at any time. The equipment shall remain in operation twenty-four hours a day until decontamination of the work area and final air sampling and analysis is completed
- I. Scaffolding: Provide all scaffolding, ladders and/or staging, etc., as necessary to accomplish the work of this contract. Scaffolding may be suspension type; or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions.

PART 3: EXECUTION

3.01 WORK AREA DEFINITIONS

The contractor shall have the capability, experience, and means required to perform the services contemplated by this contract. Services will be performed using personnel, equipment and material qualified and/or suitable to do the work requested.

The following two (2) categories of Controlled Areas may exist during the execution of this contract. The categories and the asbestos containing materials that may be removed under each category are mandated by all applicable local, state, and federal regulations.

- A. Full Containment
- B. Partial Containment

3.02 WORK AREA PREPARATION

- A. In **ALL** Controlled Areas, the Contractor shall:
1. Ensure that all ventilating systems or any other system bringing air into or out of the work area is disabled. Disable systems by disconnecting wires, removing circuit breakers, lockable switches or other positive means that will prevent accidental restarting of the equipment.
 2. Lockout power to circuits running through the work area whenever possible by switching off all breakers or removing fuses serving these circuits. Label breakers with tape over breaker with notation, "DANGER circuits being worked on." Lock panel and have all keys under control of Contractor's superintendent. If circuits cannot be shut down for any reason, label at intervals 4-feet 0-inches on center with tags reading, "DANGER live electric circuit. Electrocutation Hazard." Label circuits that are in hidden locations but

which may be affected by the work in a similar manner. Provide ground fault circuit interrupters (GFCI) receptacles for equipment used in the work areas.

3. Isolate the controlled area to prevent entry by unauthorized personnel into the area by placing opaque polyethylene barriers at each entrance to the area and by providing warning signs at each locked door leading into the work area. The signs shall be 1'-2" X 1'-8" in dimension, and shall read as follows:

LEGEND

DANGER

ASBESTOS

**CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA**

The graphic symbol for "No Admittance," which depicts a circled open hand, shall be attached near the "Danger" command on this sign.

4. Construct any and all necessary, temporary walls to completely isolate the area of asbestos disturbance.
5. Critical Barriers: Seal all openings (doors, windows, vents, duct, floor drains, and other openings within the work area, etc.) **with two (2) independent** layers of 6-mil (minimum) polyethylene containment barrier to prevent leakage of air into the outside environment or other portions of the building.
6. Pre-clean immovable objects, such as mechanical and electrical equipment within any proposed removal area, using HEPA vacuum equipment and/or wet cleaning methods as appropriate.
7. Carefully dismantle any fan covers, grilles or other mechanical items necessary to remove or clean asbestos-containing or contaminated finishes. Place the removed items back in their appropriate locations after removal is completed unless otherwise instructed by the Air Monitoring Professional.
8. Prior to placing plastic sheeting, clean the work area(s) using HEPA vacuum equipment or wet cleaning methods as appropriate. Do not use methods that raise dust such as broom or standard vacuum sweeping.
9. Seal off all openings to areas not receiving asbestos removal with plastic sheeting sealed with tape. Seal electrical panels with two layers of plastic prior to placement of wall plastic.

B. In Full Containment areas, the Contractor shall prepare the area in accordance with the following procedures:

1. Cover the floor of the Work Area with a minimum of two (2) individual layers of clear polyethylene sheeting, each at least 6-mil in thickness with seams overlapping at least 12 inches and turned up walls at least 12 inches. Form a sharp right angle bend at junction of floor and wall so that there is no radius which could be stepped on causing the wall attachment to be pulled loose. Both spray-glue and duct tape all seams in floor covering. Locate seams in top layer six feet from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer.
2. Cover all walls in the Work Area, including "Critical Barrier" sheet plastic barriers, with a minimum of two (2) layers of polyethylene sheeting, at least 6-mil in thickness with seams overlapping at least 12 inches and mechanically supported and sealed with duct tape. Tape all joints including the joints joining with the floor covering with duct or fiber tape. Install sheeting so that the layers can be removed independently.
3. Stairs and Ramps: Do not cover stairs or ramps with unsecured sheet plastic. Where stairs or ramps are covered with plastic, provide 3/4-inch exterior grade plywood treads securely held in place, over plastic. Do not cover rungs or rails with any type of protective materials.
4. The Contractor shall set up a decontamination facility connected to the work area that will consist of a change room, shower area and equipment area. This shall be done in accordance with OSHA Regulations 29 CFR 1926.1101. Water from the shower shall be filtered with an acceptable asbestos filtering system prior to discharge to the sewer
5. Provide sufficient HEPA air filtration units to maintain an airflow of at least four complete air changes per hour in the removal area and a static pressure of greater than or equal to 0.02 inches of water. All pressure differential manometer (or equivalent) readings shall be documented prior to removal of any ACM and continually throughout the duration of the removal. Collection of this data is the sole responsibility of the Contractor.
6. The Contractor shall establish emergency exits and procedures for the removal area, satisfactory to fire officials.
7. Ensure that barriers and plastic enclosures remain effectively sealed and taped. Inadvertent tears in plastic shall be repaired with fiber tape and the tear covered by plastic applied with spray adhesive, overlapping the tear by six inches on all sides.

C. In Partial Containment areas, the Contractor shall prepare the area in accordance with the following procedures:

1. Place a layer of 4-mil (minimum) polyethylene on all wall surfaces of the contained area, exposing only the asbestos-containing or contaminated materials. Wall polyethylene should extend to the floor level and be completely taped down with water resistant duct or fiber tape. Spray adhesive is recommended to assist hanging of wall plastic.
2. The Contractor shall set up a decontamination facility outside of the work area that will consist of a change room, shower area and equipment area. This shall be done in accordance with OSHA Regulations 29 CFR 1926.1101. Water from the shower shall be filtered with an acceptable asbestos filtering system prior to discharge to the sewer.
3. Provide sufficient HEPA air filtration units to maintain an airflow of at least four complete air changes per hour in the removal area, or a static pressure of greater than or equal to 0.02 inches of water. All pressure differential manometer (or equivalent) readings shall be documented prior to removal of any ACM and continually throughout the duration of the removal. Collection of the data is the sole responsibility of the Contractor.
4. The Contractor shall establish emergency exits and procedures for the removal area, satisfactory to fire officials.
5. Ensure that barriers and plastic enclosures remain effectively sealed and taped. Inadvertent tears in plastic shall be repaired with fiber tape and the tear covered by plastic applied with spray adhesive, overlapping the tear by six inches on all sides.

3.03 ASBESTOS REMOVAL

A. In Full Containment areas, the Contractor shall:

1. The Contractor shall provide the Owner's Consultant with at least 24 hours prior notice to conduct an inspection of the work areas prior to removal activities.
2. Thoroughly wet asbestos-containing materials prior to removal to reduce fiber dispersal into the air. Accomplish wetting by using a fine spray (mist) of amended water or removal encapsulant. Mist the area sufficiently to wet the material without causing excessive dripping or breaking. Allow time for water or removal encapsulant to penetrate material thoroughly.

3. If amended water is used, spray material repeatedly during the work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's written instructions.
4. If applicable, perforate the outer covering of any material that has been painted and/or jacketed in order to allow penetration of amended water, or where necessary, carefully strip away the outer covering while simultaneously spraying amended water on the insulation, to minimize dispersal of asbestos fibers into the air.
5. Remove materials in a manner, which will minimize breakage. Materials should not be sanded or sawed.
6. Mist the entire work area during removal procedures with amended water to reduce airborne fiber levels.
7. Remove wetted asbestos-containing materials in small sections. Do not allow the ACM to dry out. Upon removal, immediately place the ACMs and associated debris into a 6-mil bag with asbestos "Danger" labels on the outside surface, and seal the bag opening with tape.
8. Evacuate air from disposal bags with HEPA filtered vacuum cleaner before sealing. Twist neck of bags, bend over (goose neck) and seal with minimum three wraps of duct tape.

B. In Partial Containment areas, the Contractor shall:

1. The Contractor shall provide the Owner's Consultant with at least 24 hours prior notice to conduct an inspection of the work areas prior to removal activities.
2. Utilize water delivered in a fine mist from a hose or garden sprayer during removal of the materials. The mist should cover the immediate removal areas and should not be excessive to a point where standing or ponding water is present.
3. Remove materials in a manner which will minimize breakage. Materials should not be sanded or sawed.
4. Mist the work area continuously with amended water to reduce airborne fiber levels.
5. Upon removal, immediately place the ACMs and associated debris into a 6-mil bag with asbestos "Danger" labels on the outside surface. Twist neck of bags, bend over (goose neck) and seal with minimum three wraps of duct tape. Do not allow the material to dry out.

6. Remove the mastic adhesive by mechanical devices or use of a non-toxic mastic remover.
7. After removal of the ACMs, surface shall be wet-cleaned and wire brushed to remove residual accumulated material. After wet-cleaning, surface shall appear free to visible material.

3.04 CLEAN-UP FOR CONTROLLED AREAS

- A. The asbestos containing materials shall be sealed in plastic bags or shall be wrapped in a minimum of two (2) polyethylene sheets (6-mil minimum). Initial bagging of waste shall be supplemented by a secondary containment, either by use of a second bag (6-mil minimum) or by use of a fiber or metal drum. If it appears likely that the waste material will tear the plastic, the bag must be placed into a drum for disposal. Bags and drums shall be marked with the OSHA label prescribed by the OSHA Regulations referenced in this section. The outside of all containers shall be cleaned before leaving the work area.
- B. The Contractor shall again provide the Owner's Consultant with at least 24 hours prior notice to conduct the inspection of the work areas after removal operations have been completed but prior to application of the lockdown sealant. The Air Monitoring Professional shall perform a visual inspection of the areas. Upon completion of the inspection, and subsequent approval, final air clearance shall be performed by the Air Monitoring Professional. When the Air Monitoring Professional is ready to conduct the final air clearance testing according to the pre-established schedule, but is prevented from testing due to incompleteness of the work, all extra charges attributable to the delay shall be borne by the Contractor.
- C. Controlled areas and all other decontamination areas and cleaned areas shall be considered clean when air testing performed (following 24-hour waiting period) by the Air Monitoring Professional, and reviewed by the Owner's Consultant, shows .01 fibers per cubic centimeter (f/cc) or less of air (under an aggressive environment) using standard test methods of Phase Contrast Microscopy (PCM) for the asbestos. All air samples must comply with the above referenced standard of clearance.

Note: An aggressive environment is accomplished by the use of a leaf blower which will agitate the air. Airflow shall begin at floor level and shall extend to the ceiling at each corner of the area. This procedure shall continue for 30-minutes, at which time final air clearance sampling shall begin.

- D. Areas which do not comply with the standard of cleaning for final clearance on the first clearance test shall be completely re-cleaned. Upon approval by the Owner's Consultant, a second clearance air test shall be performed by the Owner's Consultant, using standard test methods of PCM. The Contractor shall reimburse the Owner for any additional clearance testing required beyond the first clearance test. This procedure shall continue until clearance levels are achieved.

- E. When the standards of cleaning are achieved and an inspection determines that the area has been visually decontaminated, the decontamination enclosure systems shall be removed, the area thoroughly wet cleaned (wet mopping and/or wiping), and materials from the equipment room and shower disposed of as contaminated waste. The remaining barriers between contaminated and clean areas and all seals on openings into the work area shall be removed and disposed of as contaminated waste.
- F. All plastic sheeting tape, cleaning material, clothing, and all other disposable material used in the asbestos removal operation or items used in the work area shall be packed into sealable plastic bags (6-mil minimum). These bags must be marked with the OSHA label prescribed by the OSHA Regulations.

3.05 FIELD QUALITY CONTROL

- A. The Owner's Consultant will perform pre-abatement, during abatement, and final clearance air monitoring throughout the duration of the project. The Contractor must perform necessary tests required by regulations or codes and standards for the protection of his workers, or other purpose. These tests include but are not limited to 8-hr and Excursion personal air monitoring during abatement activities. Prior to any work the Contractor shall also provide an Exposure Assessment to the Air Monitoring Professional. The Contractor's testing firm must be approved by the Owner's Consultant prior to any work.
- B. For the purposes of confirmation and quality control, the Contractor will supply the Owner's Consultant with representative, duplicate samples of not less than 10 percent of the total samples collected by the Owner's Consultant, under Chain-of-Custody for testing. Testing conducted by the Owner's Consultant will be at Owner's expense. Owner's Consultant will report testing results to the Owner and the Contractor's Superintendent, along with recommendations, if necessary.
- C. Test results shall be reported in terms of f/cc for asbestos and collected in accordance with EPA, OSHA, and NIOSH-recommended sampling volumes for appropriate detection limits. All results must be posted at the job site no later than 24 hours from sample collection.
- D. Testing Laboratory shall perform all air testing according to the method prescribed by Section 1910.1001, 1926.1101 and 1926.62 of OSHA CFR Title 29 and analyzed in accordance with procedures outlined in NIOSH 7400 Method (PCM).
- E. The Owner reserves the right to perform its own air monitoring at any time during the project without notifying the Contractor.

F. Air Sampling Schedule

During Work Activities, Per Shift

Minimum of 2 air sample inside the work areas

Minimum of 2 exterior air samples

Minimum of 1 HEPA exhaust sample

Blanks - 10% of total

Final Clearance (PCM)

Minimum of 5 samples per work area

Blanks - 10% of total

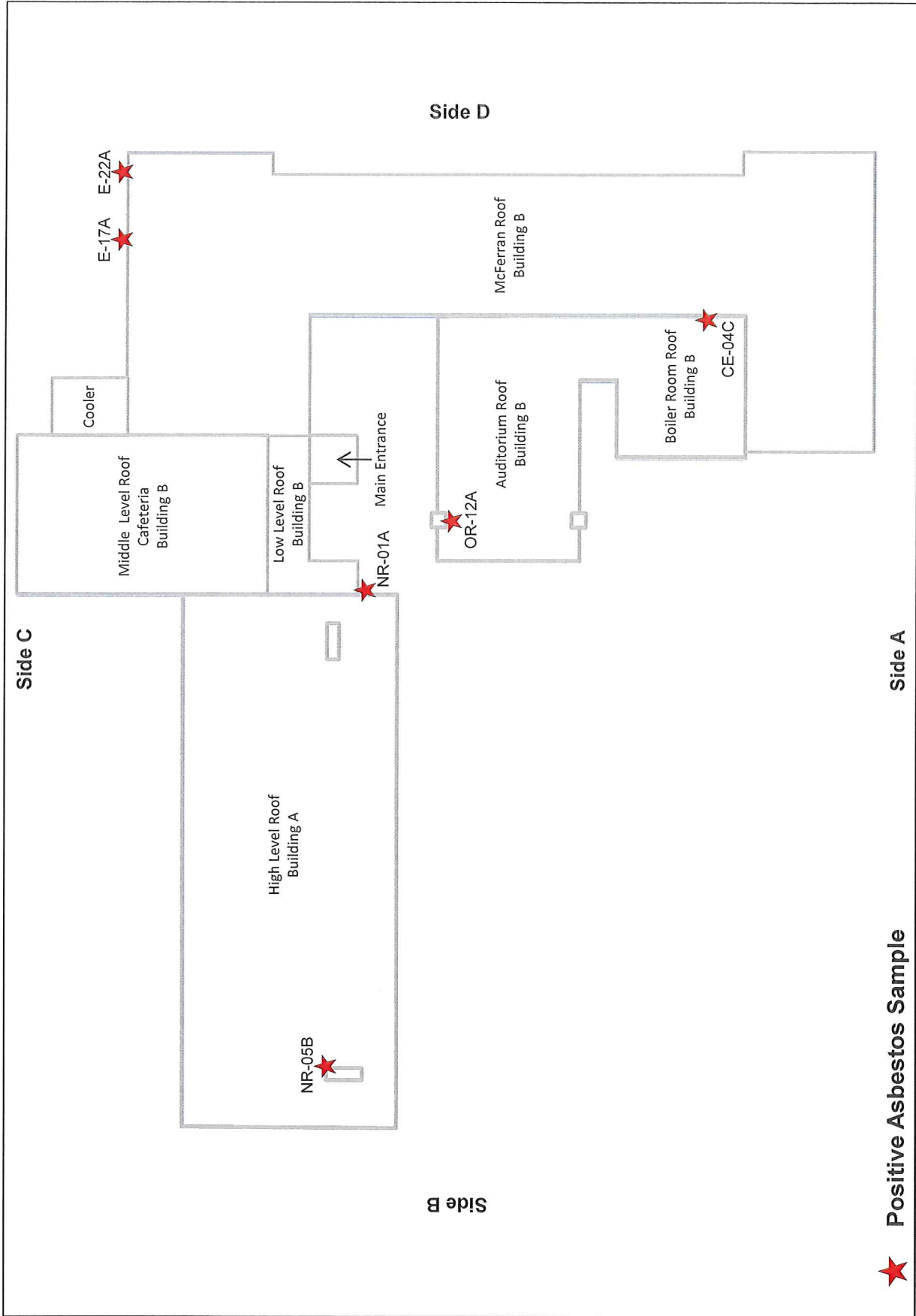
NOTE: All locations of air tests are subject to review and change by the Owner's Consultant

3.06 SCHEDULE

- A. The Owner will provide details with regard to required schedule for completion.
- B. All work shifts shall be done during administrative hours (7:00 AM to 6:00 PM) Monday-Friday excluding LMHA observed Holidays as described on Section L, #2.B, pages 1 and 2. Any change in the work schedule must be approved in writing by the Owner.
- C. The Contractor will be required to coordinate abatement activities with other redevelopment activities (that do not disturb asbestos or hazardous material) being performed simultaneously.

END OF SECTION

Asbestos diagrams are attached. The entirety of the inspection report is available upon request.



Positive Asbestos Sample



N

Exterior & Roof	
1515 Cypress Street – Louisville, KY	
Figure ER1	NTS
07/29/2016	

Roof Replacement
H. Temple Spears
1515 Cypress Street
Proposal # 1533

SECTION 05 5000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal ladders.

1.2 ACTION SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

PART 2 - PRODUCTS

2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

2.2 FASTENERS

- A. General: Unless otherwise indicated, provide stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Post-Installed Anchors: Torque-controlled expansion anchors .
1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.3 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

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2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

2.6 METAL LADDERS

- A. General:
 - 1. Comply with ANSI A14.3.
- B. Steel Ladders:
 - 1. Space siderails 18 inches apart unless otherwise indicated.
 - 2. Siderails: Continuous, 1/2-by-2-1/2-inch steel flat bars, with eased edges.
 - 3. Rungs: 3/4-inch-diameter , steel bars.
 - 4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
 - 5. Galvanize exterior ladders, including brackets.

2.7 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.

2.8 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

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PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 REPAIRS

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 05 5000

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SECTION 07 0150.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Re-cover preparation of entire roof area .
 - 2. Removal of flashings and counterflashings.

1.2 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site .

1.3 INFORMATIONAL SUBMITTALS

- A. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.
 - 1. Submit before Work begins.

1.4 QUALITY ASSURANCE

1.5 FIELD CONDITIONS

- A. Existing Roofing System: Several different types of built-up roofing including gravel-surfaced and EPDM-surfaced roofing.
- B. Owner will occupy portions of building immediately below reroofing area.
 - 1. Conduct reroofing so Owner's operations are not disrupted.
 - 2. Provide Owner with not less than 72 hours' written notice of activities that may affect Owner's operations.
 - 3. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
 - 4. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area.

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- a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
- F. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed to for rooftop equipment wheel loads and for uniformly distributed loads.
- G. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
 - 1. Remove only as much roofing in one day as can be made watertight in the same day.

PART 2 - PRODUCTS

2.1 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.
- B. Shut off rooftop utilities and service piping before beginning the Work.
- C. Test existing roof drains to verify that they are not blocked or restricted.
 - 1. Immediately notify Architect of any blockages or restrictions.
- D. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
 - 1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

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- E. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- F. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
 - 1. Prevent debris from entering or blocking roof drains and conductors.
 - a. Use roof-drain plugs specifically designed for this purpose.
 - b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
 - a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.
 - 1. Do not proceed with installation until directed by Architect.
- C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.
 - 1. Do not proceed with installation until directed by Architect.

3.3 ROOF RE-COVER PREPARATION

- A. Remove blisters, ridges, buckles, and other substrate irregularities from existing roofing that inhibit new recover boards from conforming to substrate.
 - 1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
 - 2. Broom clean existing substrate.
 - 3. Verify that existing substrate is dry.
 - a. Spot check substrates with an electrical capacitance moisture-detection meter.
 - 4. Remove materials that are wet or damp.

END OF SECTION 07 0150.19

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SECTION 07 5423 - THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system.
2. Substrate board.
3. Roof insulation.
4. Cover board.
5. Walkways.

1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- ##### A. Product Data: For each type of product.

1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.

1.4 INFORMATIONAL SUBMITTALS

- ##### A. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

- ##### A. Maintenance data.

1.6 QUALITY ASSURANCE

1.7 WARRANTY

- ##### A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 15 years from date of Substantial Completion.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
- B. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- C. SPRI's Directory of Roof Assemblies Listing: Roof membrane, base flashings, and component materials shall comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and shall be listed in SPRI's Directory of Roof Assemblies for roof assembly identical for that specified for this Project.
 - 1. Wind Uplift Load Capacity: 90 psf.

2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

- A. TPO Sheet: ASTM D6878/D6878M, internally fabric- or scrim-reinforced, fabric-backed TPO sheet.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle SynTec Incorporated.
 - b. Firestone Building Products.
 - c. GAF.
 - d. GenFlex Roofing Systems.
 - e. Johns Manville; a Berkshire Hathaway company.
 - f. Versico Roofing Systems.
 - 2. Thickness: 45 mils, nominal.
 - 3. Exposed Face Color: White.

2.3 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
 - 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 55 mils thick, minimum, of same color as TPO sheet.
- C. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.

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- D. Bonding Adhesive: Manufacturer's standard.
- E. Slip Sheet: ASTM D2178/D2178M, Type IV; glass fiber; asphalt-impregnated felt.
- F. Slip Sheet: Manufacturer's standard, of thickness required for application.
- G. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8-inch-thick; with anchors.
- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.4 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C728, perlite board, seal coated.
 - 1. Thickness: 3/4 inch.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate board to roof deck.

2.5 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
 - 1. Size: 48 by 48 inches.
 - 2. Thickness:
 - a. Base Layer: 1-1/2 inches.
- B. Tapered Insulation: Provide factory-tapered insulation boards.
 - 1. Material: Match roof insulation.
 - 2. Minimum Thickness: 1/4 inch.
 - 3. Slope:
 - a. Roof Field: Achieve roof slope of new and existing insulation to 1/4 inch per foot unless otherwise indicated on Drawings.
 - b. Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.

2.6 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners with metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation [**and cover boards**] to substrate, and acceptable to roofing system manufacturer.

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- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 - 1. Full-spread, spray-applied, low-rise, two-component urethane adhesive.
- C. Cover Board: ASTM C208, Type II, Grade 2, cellulosic-fiber insulation board, 1/2 inch thick.

2.7 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16-inch-thick and acceptable to roofing system manufacturer.
 - 1. Size: Approximately 36 by 60 inches.
 - 2. Color: Contrasting with roof membrane.

PART 3 - EXECUTION

3.1 REPARATION

- A. Perform fastener-pullout tests according to roof system manufacturer's written instructions.
 - 1. Submit test result within 24 hours after performing tests.
 - a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.

3.2 INSTALLATION OF ROOFING, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning Work on adjoining roofing.
- C. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition.

3.3 INSTALLATION OF SUBSTRATE BOARD

- A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.
 - 1. Tightly butt substrate boards together.
 - 2. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 3. Loosely lay substrate board over roof deck.

3.4 INSTALLATION OF INSULATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and roof insulation manufacturer's written instructions for installing roof insulation.
- C. Installation Over Substrate Board:
 - 1. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows.
 - a. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - b. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - c. Fill gaps exceeding 1/4 inch with insulation.
 - d. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - e. Loosely lay base layer of insulation units over substrate.
 - f. Adhere base layer of insulation to substrate board.
 - 1) Set insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
 - 2. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
 - a. Staggered end joints within each layer not less than 24 inches in adjacent rows.
 - b. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
 - c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - d. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - e. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
 - 1) Trim insulation so that water flow is unrestricted.
 - f. Fill gaps exceeding 1/4 inch with insulation.
 - g. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - h. Loosely lay each layer of insulation units over substrate.
 - i. Adhere each layer of insulation to substrate using adhesive according.
 - 1) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
 - 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 2. At internal roof drains, conform to slope of drain sump.

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- a. Trim cover board so that water flow is unrestricted.
3. Cut and fit cover board tight to nailers, projections, and penetrations.
4. Loosely lay cover board over substrate.
5. Adhere cover board to substrate using adhesive according.
 - a. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- B. Install slip sheet over cover board and beneath roof membrane.

3.6 INSTALLATION OF ADHERED ROOF MEMBRANE

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roof membrane and allow to relax before installing.
- C. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- F. Fabric-Backed Roof Membrane Adhesive: Apply to substrate at rate required by manufacturer, and install fabric-backed roof membrane.
- G. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeter of roofing.
- H. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- I. Seams: Clean seam areas, overlap roof membrane, and hot-air weld side and end laps of roof membrane and sheet flashings, to ensure a watertight seam installation.
 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof membrane and sheet flashings.
 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.

3.7 INSTALLATION OF BASE FLASHING

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.

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- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 INSTALLATION OF WALKWAYS

- A. Flexible Walkways:
 - 1. Install flexible walkways at the following locations:
 - a. Perimeter of each rooftop unit.
 - b. Between each rooftop unit location, creating a continuous path connecting rooftop unit locations.
 - c. Between each roof hatch and each rooftop unit location or path connecting rooftop unit locations.
 - d. Top and bottom of each roof access ladder.
 - e. Between each roof access ladder and each rooftop unit location or path connecting rooftop unit locations.
 - 2. Provide 6-inch clearance between adjoining pads.
 - 3. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.9 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 5423

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SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formed roof-drainage sheet metal fabrications.
2. Formed low-slope roof sheet metal fabrications.
3. Formed wall sheet metal fabrications.

1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following

1. Elastomeric sealant.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashing.
10. Include details of special conditions.
11. Include details of connections to adjoining work.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with and requirements for dimensions and profiles shown unless more stringent requirements are indicated.

2.2 SHEET METALS

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Copper Sheet: ASTM B370, cold-rolled copper sheet, H00 or H01 temper.
 - 1. Nonpatinated, Exposed Finish: Mill.
- C. Lead Sheet: ASTM B749 lead sheet.

2.3 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

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2. Fasteners for Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
- C. Elastomeric Sealant: ASTM C920, elastomeric [**polyurethane**] [**polysulfide**] [**silicone**] polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- D. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances:
1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

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G. Seams:

1. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
2. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters:

1. Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
2. Fabricate in minimum 96-inch- long sections.
3. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard, but with thickness not less than twice the gutter thickness.
4. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
5. Gutters with Girth 21 to 25 Inches: Fabricate from the following materials:
 - a. Copper: 20 oz./sq. ft.

B. Downspouts: Fabricate rectangular downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors . Shop fabricate elbows.

1. Fabricate from the following materials:
 - a. Copper: 16 oz./sq. ft.

C. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper. Fabricate from the following materials:

1. Copper: 16 oz./sq. ft.

D. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes, exterior flange trim, and built-in overflows. Fabricate from the following materials:

1. Copper: 16 oz./sq. ft.

E. Splash Pans: Fabricate to dimensions and shape required and from the following materials:

1. Copper: 16 oz./sq. ft.

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2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop): Fabricate in minimum 96-inch- long, but not exceeding 12-foot- long sections. Furnish with 6-inch- wide, joint cover plates. Shop fabricate interior and exterior corners.
 - 1. Fabricate from the following materials:
 - a. Copper: 20 oz./sq. ft.
- B. Copings: Fabricate in minimum 96-inch- long, but not exceeding 12-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, fasten and seal watertight. Shop fabricate interior and exterior corners.
 - 1. Fabricate from the following materials:
 - a. Copper: 24 oz./sq. ft.
- C. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
 - 1. Copper: 16 oz./sq. ft.
- D. Roof-Penetration Flashing: Fabricate from the following materials:
 - 1. Copper: 16 oz./sq. ft.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
 - 1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of sealant.
 - 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 - 5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
 - 6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 - 7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
 - 8. Do not field cut sheet metal flashing and trim by torch.

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- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 - 1. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
 - 1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 - 2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 - 3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
 - 1. Use sealant-filled joints unless otherwise indicated.
 - a. Embed hooked flanges of joint members not less than 1 inch into sealant.
 - b. Form joints to completely conceal sealant.
 - c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
 - d. Adjust setting proportionately for installation at higher ambient temperatures.
 - 1) Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 07 9200 "Joint Sealants."

3.2 INSTALLATION OF ROOF-DRAINAGE SYSTEM

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters:
 - 1. Join sections with riveted and soldered joints or joints sealed with sealant.
 - 2. Provide for thermal expansion.
 - 3. Attach gutters at eave or fascia to firmly anchor them in position.
 - 4. Provide end closures and seal watertight with sealant.
 - 5. Slope to downspouts.

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6. Install gutter with expansion joints at locations indicated on Drawings, but not exceeding, 50 feet apart. Install expansion-joint caps.

C. Downspouts:

1. Join sections with 1-1/2-inch telescoping joints.
2. Provide hangers with fasteners designed to hold downspouts securely to walls.
3. Locate hangers at top and bottom and at approximately 60 inches o.c.
4. Connect downspouts to underground drainage system.

D. Splash Pans:

1. Install where downspouts discharge on low-slope roofs.
2. Set in elastomeric sealant compatible with the substrate.

E. Parapet Scuppers:

1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
2. Anchor scupper closure trim flange to exterior wall and seal with elastomeric sealant to scupper.
3. Loosely lock front edge of scupper with conductor head.
4. Seal with elastomeric sealant exterior wall scupper flanges into back of conductor head.

- F. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch below scupper discharge.

- G. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated on Drawings. Lap joints minimum of 4 inches in direction of water flow.

3.3 INSTALLATION OF ROOF FLASHINGS

- A. Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard.

1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing:

1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

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C. Copings:

1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated.
 - a. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.
 - b. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.
3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.

1. Insert counterflashing in reglets or receivers and fit tightly to base flashing.
2. Extend counterflashing 4 inches over base flashing.
3. Lap counterflashing joints minimum of 4 inches.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.4 INSTALLATION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.5 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 07 6200

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SECTION 07 9200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Urethane joint sealants.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.

1.4 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Colors of Exposed Joint Sealants: As indicated by manufacturer's designations.

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2.2 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Sika Corporation; Joint Sealants.
- B. Urethane, S, P, 35, T, NT: Single-component, pourable, plus 35 percent and minus 35 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade P, Class 35, Uses T and NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Bostik, Inc.

2.3 JOINT-SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Adfast.
 - b. Alcot Plastics Ltd.
 - c. Construction Foam Products; a division of Nomaco, Inc.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

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PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with ASTM C 1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 1. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

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1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Vertical joints on exposed surfaces of walls and partitions.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Urethane, S, NS, 25, NT.
 3. Joint-Sealant Color: As indicated by manufacturer's designations.
- B. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
 3. Joint-Sealant Color: As indicated by manufacturer's designations.

END OF SECTION 07 9200