SECTION 00 01 07
SEALS PAGE

PROJECT MANUAL FOR

TREADWELL K-8 SCHOOL

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SECTION 01 10 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK UNDER THIS CONTRACT

A. Provide labor, materials, equipment, and all other related services to perform work, both temporary and permanent, for work shown and included within the Project Manual (Specifications) and Drawings, consisting of:
   1. Remove existing roof, insulation, and flashings. Provide new single-ply membrane roof over new polyiso insulation.

B. The BASE PROPOSAL, as indicated on the BID PROPOSAL FORM, shall consist of a lump sum bid for the work.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Owner's Contract for Construction and other Division - 01 Specifications Sections apply to this Section.

1.03 WORK PERFORMED UNDER SEPARATE CONTRACTS:

A. Work denoted as "Not in Contract" (N.I.C) will be furnished and installed by the Owner or by others under separate contracts.

1.04 PROJECT DESCRIPTION

A. Project Address: 920 N. Highland St. Memphis, TN 38122.

B. Scope of Work Includes tear-off of all existing roofing layers down to the existing deck and the replacement of the Roofing System to include but not limited to roof membrane, insulation, coping, terminations, drains, gutters, downspouts, expansion joints, roof hatches, etc. Adjustments and minor work will also be completed on existing rooftop equipment and masonry walls. Work will be performed at 920 N. Highland St. Memphis, TN 38122.

C. Where roof, parapet, and wall elevations are already altered by the requirements identified in the drawings or Project Manual, the Contractor shall extend all conduits, utilities, drains, joints, flashings, electric, gas, and plumbing lines to accommodate adjusted thicknesses and fully maintain existing services and capacity.

D. Daily cleaning of the facility in the areas of construction will be required to the satisfaction of the Owner's Consultant. Assume classes will remain in session during the entire construction process.

E. All construction employees must have identification badges from their employing contractor while on site, and a sign-in roster will be required for control.

F. Smoking is not permitted on Campus. It is a Smoke-Free Campus.

G. Parking should be coordinated with the Owner prior to Construction. They will identify a lot and assign temporary parking tags for that area only. Parking in spaces and lots identified as staff, faculty, and gated areas is not allowed.

1.05 PROTECTION AND/OR REPLACEMENT OF CONTIGUOUS ITEMS

A. All contiguous items and other items which are disturbed, broken, removed, or otherwise damaged during the execution of this Contract shall be replaced with materials, methods, and design of the original construction.

1.06 CONTRACTOR USE OF PREMISES

A. General: Limit use of the Premises to construction activities.
   1. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed. Parking areas for Contractor and employees shall be pre-arranged with the Owner in advance of the Work beginning and the Contractor mobilizing onto the site. Parking on streets and in

unauthorized areas by Contractor and employees is not permitted. Keep new and existing driveways and entrances indicated on drawings serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize conflicts with peak traffic hours and to minimize space and time needed for storage of materials and equipment.

2. Avoid heavy construction activities, parking, and staging within the canopies of existing trees and landscaping.
3. Construction Staging and material storage per 01 60 00 - Products.

1.07 LOCATING AND PROTECTING OF EXISTING UTILITIES

A. Unknown Utility Lines
   1. In performing the work under the Contract, it is possible that unknown utility lines may be encountered. Such lines may be lines which have been, or will be, abandoned, inactive lines which may be desired to be preserved for future use, or active lines which must be preserved and either relocated or replaced.
   2. Should such unknown lines be encountered, immediately notify the Architect in writing, who will examine the lines to determine whether they have been or will be abandoned or shall be preserved. The Contractor shall assist the Architect by making tests or otherwise as the Architect deems necessary to determine how best to dispose of them.
   3. If the lines have been or may be abandoned, remove them to the extent necessary without additional cost to the Owner. If it is found desirable or necessary to preserve the lines, they shall be capped off, relocated, or replaced, as directed by the Architect, by making tests or otherwise as the Architect deems necessary to determine how best to dispose of them.
   4. Should changes in connection with unknown utility lines which are to remain active involve a change in the quantity of work called for by the Drawings and Specifications, the Contract Amount shall be equitably adjusted, by a Change Order, in accordance with the provisions of the Owner's Contract for Construction for changes in the work.
   5. Make a personal inspection of all existing records showing locations of buried and underground utilities. Conduct a walking examination to physically verify locations of existing utilities and any conflicts with the proposed construction and the location of existing utilities.
      a. Prior to performing any excavation and/or trenching operations, call Tennessee One Call Buried Utility Location, 1-800-351-1111.

1.08 GRADES, LINES, LEVELS, AND SURVEYS

A. All grades, lines, levels, and benchmarks for the building shall be established and maintained by the Contractor who shall be responsible for same.

B. Verify all grades, lines, levels, and dimensions as shown on the Drawings, and report any errors or inconsistencies discovered in the above to the Architect before commencing work. Provide and maintain established benchmarks in not less than two widely separated places.

1.09 FIELD MEASUREMENTS

A. The Contractor shall take measurements in the field to verify or supplement dimensions indicated on Drawings and shall be responsible for accurate fit of specified work. Any discrepancy between the Drawings and the actual conditions shall be reported immediately to the Architect.

B. Tolerances: The Contractor shall be responsible to maintain dimensions for spaces requiring close tolerances for such items as equipment or fixtures by "grounding" such locations. Uneven surfaces and joints will not be accepted which prevent the installation of units whose dimensions are shown in the documents.

1.10 AUTHORITIES HAVING JURISDICTION AND APPLICABLE CODES

A. The Contractor shall appoint an employee who is continually employed on the job site (such as the Superintendent) whose additional duty will be to act as fire warden for the project. The fire warden shall institute and vigorously enforce a program of fire safety for the project.

B. Contractor shall submit the project for review and permit by all authorities having jurisdiction (AHJs).

C. Contractor shall conform to all Fire Department Requirements related to maintaining an approved all-weather access road into the Construction Site. Contractor shall also provide fire flows required from proposed fire hydrant locations. All required materials will be confirmed with the fire department and submitted to the Architect, Owner, and Owner's Consultant prior to beginning work.

D. All reference to codes, specifications, and standards in the Specification sections of this Project Manual and on the drawings shall mean, and are intended to be, the latest edition, amendment, or revision of such standard in effect as of the date of these Contract Documents.

E. In cases of conflict, the most stringent requirements shall apply.

1.11 SERVICE TO EQUIPMENT

A. Equipment requiring a service connection from a utility supply such as electricity, steam, water, gas, etc., shall have the characteristics of the utility service required by the equipment confirmed prior to the installation and purchase of the equipment.

1.12 EFFECT OF ADDENDA, AMENDMENTS, BULLETINS, DELETIONS, OMISSIONS, AND CHANGE ORDERS

A. No special implication, interpretation, construction, connotation, denotation, import of meaning shall be assigned to any provision of the Contract Documents due to changes created by the issuance of (1) Addenda, (2) Amendments, (3) Bulletins, (4) Notices of Deletion, (5) Notices of Omission, or (6) Change Orders other than the precise meaning that the Contract Documents would have had if the provision thus created by (1) Addenda, (2) Amendments, (3) Bulletins, (4) Notices of Deletion, (5) Notices of Omission, or (6) Change Orders by which it was created.

1.13 CONTRACT FORMS AND BIDDING REQUIREMENTS

A. Forms, requirements, and documents included under Division 00, Bidding and Contract Requirements, and Division 01, General Requirements of the Project Manual, are a part of the Contract Documents.

B. Plan Sheets are a part of the Contract Documents.

C. The requirements of Division 00 and Division 01 apply to all Divisions and Sections of the Project Manual as if reproduced therein.

PART 2 - MATERIALS (NOT USED)

PART 3 - EXECUTION

3.01 WORK SEQUENCE

A. The purpose of this project is the replacement of roofing systems, edge metal, copings, drainage systems, and hatches. The Work will be conducted under one contract for construction. Contractor is to provide written notification to the Architect, Owner, and Owner's Consultant well in advance of any possibly conflicting construction activities.

B. The Campus will remain open and operational during the entire construction process and all Classes will continue on their scheduled time. The Contractor should take notice of dates the school will be closed and hours the Campus is NOT in operation to schedule tasks that are LOUD in nature and construction that may hinder traffic patterns and block Fire Exits. Campus will provide a school calendar and critical dates (exams) to aid in establishing a sequence of work.

C. The Contractor is required to submit a construction sequence and schedule for each of the individual buildings involved as well as each campus as a whole for approval to the Architect, Owner, and Owner's Consultant at the Preconstruction meeting.

3.02 WORK BY OTHERS

A. Cooperate with other contractors or Owner's work crews for work on this Project in the arrangements for storage of materials and in the detailed work of these separate contractors. Notify the Architect immediately of lack of progress or defective workmanship on their part where such delay or defective workmanship will interfere with Contractor's own operations. Contractor's failure to keep informed of the progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with Contractor's own work. Proceeding with work attached, adjacent, adhered to, covering, or above preceding work in the contract will be understood as acceptance of preceding work by Contractor and subcontractors alike.

B. All subcontractors, suppliers, etc. shall be responsible for knowing what information is given on all sheets of the Plans and Specifications concerning his particular work. If an item or piece of work is shown on the Architect and not the mechanical, electrical, or structural drawings, it shall be included in the Contract. The reverse condition shall also apply.

3.03 USE AND OCCUPANCY OF PROJECT PRIOR TO ACCEPTANCE

A. The Owner shall have the right to take possession of and use any completed or partially completed portions of the work, but such taking of possession and use shall not be deemed as acceptance of any work not completed in accordance with the Contract Documents. Contractor, Owner, Owner's Consultant, and Architect shall make an inspection of the work, and a Certificate of Substantial Completion shall be issued on the inspected and occupied area only, indicating partial acceptance of the work.

B. The Contractor agrees to the use and occupancy of a portion or unit of the Project before formal acceptance by the Owner under the following conditions:
   1. A Certificate of Substantial Completion shall be prepared and executed. Upon receipt of the Certificate of Substantial Completion, the Contractor shall obtain a written endorsement of the Contractor's Insurance Carrier and Surety permitting occupancy by the Owner during the remaining period of project work.
   2. Occupancy by Owner shall not be construed as being an acceptance of that part of the project to be occupied.
   3. The Contractor shall not be held responsible for damage to the occupied part of the Project resulting from Owner's occupancy.
   4. Occupancy by Owner shall not be deemed to constitute a waiver of existing claims on behalf of the Owner or Contractor against each other.
   5. Use and occupancy by Owner prior to project acceptance does not relieve the Contractor of his responsibility to maintain all insurance and bonds required of Contractor until Project is completed and accepted by Owner.

3.04 PROJECT SITE CLEAN–UP REQUIREMENTS

A. The Contractor shall be responsible for keeping the site clean and orderly and the adjacent streets, driveways, walks, structures, and yards free of mud, debris, refuse, construction equipment, personnel parking, etc. in strict accordance with the ordinances and requirements of Shelby County, Tennessee and the requirements of Memphis-Shelby County Schools.

B. It shall be the duty of this Contractor to assume such contract obligations and provide whatever equipment necessary, including washing facilities, to keep the equipment from depositing materials on the public streets.

C. Upon seven (7) days written notice, if the Contractor fails to correct or clean up any deposits, the Owner may without prejudice to any other remedy, make good such contract deficiencies. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

3.05 OPTIONS OF WORK

A. If the Contractor is given an option of materials and methods used in the work and installation, the aim is to achieve the most economical installation that is acceptable for the work indicated by the option. In such cases, it is the intention of the Drawings and Specifications that the option fully cover usual items for a completed job whether mentioned specifically or not.

3.06 FIRE PREVENTION

A. The Contractor shall meet with the Fire Marshall prior to beginning of construction and propose a plan for fire prevention and protection during the construction period, with particular emphasis on protecting the building during construction. The plan shall include, but will not be limited to, provisions for exits where necessary due to construction processes on existing exits, access for the Fire Department to the site and areas of the building, early awarding of contracts for fire prevention equipment, proper supervision of open flames, and welding or cutting equipment, use of flame- proofed tarpaulins, hydrant protection availability, emergency protection in the form of extinguishers, water pails, sand, and small hose streams. Combustibles shall be kept outside of new construction. An emergency procedure for fire alarm shall be established.

3.07 REVISION OF SCHEDULES

A. The Architect shall revise and reissue upon request by the Contractor those schedules in the Contract Documents that have been drastically changed by the Addenda. These will be issued to the Contractor as soon as possible after Contract award.

3.08 OBSTRUCTION, CUTTING, AND REPAIRING

A. Any obstructions encountered during the construction or installation of the Contract work shall be overcome by the Contractor, by removal or alteration of work in place, or adjustments in the new work, without additional cost to the Owner. All cutting of work in place shall be performed in a neat and workmanlike manner and held to a minimum. All cutting of work in place shall be patched and restored to good condition acceptable to the Architect.

3.09 COORDINATION

A. LAYOUT: Contractor shall locate and lay out the work and all its parts and establish lines and levels accurately.
   1. The Contractor and subcontractors shall coordinate their work with all parties performing work under the contract per 01 31 00 - Project Management and Coordination. Coordinate material lay down and storage space with the Owner in advance of delivery. If insufficient space exists on site, the Contractor shall store materials in a secure and appropriately climate-controlled location off-site. The Contractor shall submit photographs of stored materials with pay application per 01 20 00 - Applications for Payment.

B. USE OF PREMISES: Confine apparatus, storage of materials, and operations of workmen to limits indicated by law, ordinances, permits, or directions of the Owner and Owner's Consultant. Do not unreasonably encumber the premises and materials.

C. Coordination of Work
   1. The Contractor and subcontractors, particularly mechanical and electrical, shall review other sections of work applicable to their own work. Each shall be held responsible for coordination and inclusion of the work indicated as if it were in the particular subcontractor’s section. The Architect shall be advised in writing of any discrepancies or conflicts at the earliest moment.
   2. Coordinate work of the various sections of Specifications to ensure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
   3. Coordinate scheduling, submittals, and work of the various sections to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items scheduled to be installed at a later time.

4. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
5. Coordinate dimensioning and space requirements and installation of plumbing, mechanical, and electrical work, which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Confirm alignments with Architect, Owner, and Owner's Consultant. Utilize spaces efficiently to maximize accessibility for other installations.
6. Project to be Bid as a single Scope of Work.

D. Verify that utility requirements of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in such service equipment.

E. Coordinate space requirements and installation of mechanical and electrical. Follow routing where shown for pipes, ducts, and conduit. Utilize space efficiently to maximize accessibility for other installations, maintenance, and repairs.

F. In finished areas conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements. Coordinate completion and clean-up of work of various sections in preparation for Substantial Completion.

G. Examine the substrate and the conditions under which the work of each section is to be performed. Do not proceed with work under that section until unsatisfactory conditions have been corrected.

H. Determine temperature and humidity requirements for installation areas. Do not install work until required temperature and relative humidity have been stabilized and maintained in those areas per manufacturer recommendations and the Project Manual.

I. Coordinate building mechanical system operation requirements with delivery of items and installation requirements.

3.10 OWNER - FURNISHED ITEMS

A. Work Performed Under Separate Contracts or “Not in Contract” (N.I.C.) or Owner Furnished/Owner Installed (OFOC):
1. Work denoted as “By Others” will be furnished and installed by the Owner or by others under separate contracts. Contractor shall rough-in and make connections of mechanical and electrical services as required for work not in Contract.
2. Owner Furnished/Contractor Installed (OFCI): Items designated OFCI will have the labor included in the base contract.
3. The Owner will arrange and pay for delivery of Owner-furnished items in accordance with the Contractor’s Construction Schedule and will inspect deliveries for damage.
4. If Owner-furnished items are damaged, defective, or missing, the Owner will arrange for replacement. The Owner will also arrange for manufacturer’s field services and the delivery of manufacturer’s warranties and bonds to the Contractor.
5. The Contractor is responsible for designating the delivery dates of Owner-furnished items in the Contractor’s Construction Schedule and for receiving, unloading, and handling Owner-furnished items at the site. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements and to repair or replace items damaged as a result of his operations.

3.11 TRANSPORTATION, STORAGE AND PROTECTION

A. Protect work during transit, delivery, storage, and handling to prevent damage, soiling, and deterioration.

B. Do not deliver items until operations which could damage finished work have been completed in storage of installation areas. If items specified herein must be stored in area other than install area, store only in areas meeting requirements specified for install area. When specified items are stored off the job site, provide adequate insurance to protect tenant from loss.

C. There may be limitations to the maximum size object that can be moved from a loading area to the install area. Coordinate items to ensure delivery to the proper location.

D. Maintain conditions necessary to ensure that work will be without damage or deterioration at time of acceptance. Just prior to Owner's acceptance, remove protective covering, wipe clean, adjust and lubricate hardware, check proper operation of all items.

3.12 CLEANING

A. Each contractor, at all times, shall keep the premises free from accumulation of waste material or rubbish caused by his operations. At the completion of the work, he shall remove all his waste materials and rubbish from and about the Project, as well as his tools, construction equipment, machinery, and surplus materials.

B. Execute final cleaning prior to final inspection. In addition, refer to and comply with the manufacturers' specific recommendations concerning cleaning methods and materials. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean permanent type filters and replace renewable media type filters of operation equipment. Remove waste and surplus materials, rubbish, and construction facilities from the site.

C. Adjust operating products and equipment to ensure smooth and unhindered operation.

D. Refer to Section 01 74 00 - Cleaning for additional requirements.

END OF SECTION 01 10 00

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SECTION 01 20 00
APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

B. Submit Application and Certificate for Payment on a percentage complete basis to the Architect in accordance with the schedule established under the General Conditions and the Owner/Contractor Agreement.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract: Progress payments, retainages, Change Orders, and final payment.

B. Section 01 77 00 - Closeout Procedures.

C. Section 01 22 00 - Unit Prices.

1.03 REFERENCE STANDARDS

A. AIA G702 - Application and Certificate for Payment; 1992.

B. AIA G703 - Continuation Sheet; 1992.

1.04 FORMAT AND DATA REQUIRED

A. Submit itemized applications following approved Schedule of Values, typed on AIA G702, Application and Certificate for Payment and Continuation Sheet(s), AIA G703.

B. Provide itemized data including continuation sheets, schedules, line items and values, and stored materials' documentation as itemized.

1.05 SUBMITTAL PROCEDURE

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Submit Applications and Certificates for Payment to Architect at the times stipulated in the Owner/Contractor Agreement.

C. Submit a digital copy of each application.

D. When the Architect finds the application properly completed and correct, he will transmit Certificate for Payment to Owner with copy to Contractor per the General Conditions.

1.06 APPLICATIONS FOR PAYMENT

A. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.

B. Round to the nearest whole dollar; the total shall equal the Contract Sum.

C. Provide a separate line item in the Schedule of Values for each part of the work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.

D. Unit-Cost Allowances: Show the line-item value of unit-cost allowances, as a product of the unit cost, multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.

E. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

F. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.

1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

G. Payment-Application Times: Each progress payment date is indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

H. Payment Application Forms: Use AIA G702 and Continuation Sheets AIA G703 as the form for Applications for Payment.

I. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Architect will return incomplete applications without action.
   1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
   2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

J. Transmittal: Submit digital and notarized original copies of each Application for Payments to the Architect by a method ensuring receipt within 24 hours.

K. Initial Application for Payment: Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:
   1. List of subcontractors.
   2. List of principal suppliers and fabricators.
   3. Schedule of Values.
   4. Contractor's Construction Schedule.
   5. Schedule of principal products.
   6. Schedule of unit prices.
   7. Submittal Schedule.
   8. List of Contractor's staff assignments.
   9. List of Contractor's principal consultants.
   10. Copies of building permits.
   11. Copies of authorizations and licenses from governing authorities for performance of the Work.
   12. Report of preconstruction meeting.

L. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment in accordance with General Conditions.
   1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

M. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
   1. Completion of Project closeout requirements.
   2. Completion of items specified for completion after Substantial Completion.
   3. Ensure that unsettled claims will be settled.
   4. Ensure that incomplete work is not accepted and will be completed without undue delay.
   5. Transmittal of required project construction records to the Owner.
   6. Certified property survey.
   7. Proof that taxes, fees, and similar obligations were paid.
   8. Removal of temporary facilities and services.
   9. Removal of surplus materials, rubbish, and similar elements.
   10. Change of door locks to Owner's access.

N. Continuation Sheets
   1. Fill in total list of all scheduled component items of work with item number and scheduled dollar value for each item.

2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to nearest dollar, or as specified for Schedule of Values (S.O.V.).
3. List each Change Order executed prior to date of submission at the end of the continuation sheets. List by Change Order number and description, as for an original component item of work. Change Orders shall be shown on a percentage complete basis like all items on the Schedule of Values.

1.07 SUBSTANTIATING DATA AND PROCEDURE FOR OFF-SITE STORED MATERIALS

A. The Contractor purchasing such materials shall advise the Architect, in writing, in advance as to the anticipated quantity of such storage and set forth the location, in detail, at which such materials are to be stored.

B. The Contractor and each subcontractor requesting payment for materials stored off-site shall submit a monthly inventory of such materials approved for off-site storage which are on hand at the end of each billing period and support any new additions to such inventories by copies of vendor's invoice that would set forth quantities and prices substantiating the Contractor's right to payment.

C. The Contractor and each of said subcontractors shall certify on the inventory listing for current payment that vendors of previously submitted off-site stored inventories have been paid in full.

D. The Contractor shall submit photos of all stored materials to the Owner, Owner's Consultant, and Architect.

E. The sole risk and responsibility for the safety of materials stored off-site rests with the Contractor, subcontractors, and surety.

F. Before payment can be authorized for such materials, the Contractor and all subcontractors requesting payment for materials stored off-site shall submit to the Owner and Owner's Consultant a Certificate of Insurance with an endorsement form acceptable to the Owner, both as to the amount and scope of parties involved. This certificate shall represent that site, with insurance in place, is adequately protected under reference to materials stored off-site, and insurance shall be carried at the sole expense of the Contractor and all subcontractors concerned.

G. The Contractor shall obtain from the surety, written authority satisfactory to the Owner prior to implementation of this procedure for payment for materials stored off-site.

H. The Contractor or any subcontractors involved in the use of materials for any purpose other than for that which it has been designated forfeits all rights to payment for materials stored off-site.

1.08 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in application form as specified for progress payments.

B. Use continuation sheet(s) for presenting final statement of accounting.

C. Consult Section 01 77 00 - Closeout Procedures.

PART 2 – MATERIALS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 20 00

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SECTION 01 22 00
UNIT PRICES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for Unit Prices.

B. List of Unit Prices.

1.02 RELATED REQUIREMENTS

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

B. Section 01 26 00 - Contract Modification Procedures for procedures for submitting and handling Change Orders.

1.03 DEFINITIONS

A. Unit Price is a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.04 PROCEDURES

A. Unit Prices include all necessary material plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit and are treated as direct prices to the Owner by the Contractor, regardless of whether the work of the Unit Price item is being performed by the Contractor or subcontractor.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of Unit Prices. Methods of measurement and payment for Unit Prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of Work in-place that involves use of established Unit Prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. Unit prices are subject to determination at the time of a Modification if the solicited Unit Price was not accepted and not listed in the Agreement.

E. Each Unit Price multiplied by its quantity constitutes an amount to be charged or credited to the allowance included in the Contract Sum where provided or to be added or credited to the Contract via change order where a corresponding allowance is not provided.

F. List of Unit Prices: A list of Unit Prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each Unit Price.

1.05 ADMINISTRATION

A. Use the related item number on all Unit Price documentation.

B. Represent the allowance for each Unit Price item as a distinct line item in the Schedule of Values.

C. Keep a daily log of actual quantities of specified work units encountered, consumed, or expended. When submitting an application for payment which includes payment for Unit Price items, provide Architect a copy or report of the log which is acceptable to Architect. Work units, actual quantities, and the Contractor’s log are subject to verification by Architect.

D. Adjustment of costs:

1. Continuously monitor the consumption of each base quantity and the associated use of the allowance and the anticipated use to complete the Work. Do not exceed an allowance.
2. If a base quantity and the associated allowance are at risk of being exceeded, request a Modification to increase them in a timely manner to avoid delay in the Work.

3. If all of the Work of an allowance is complete and there is unexpended Allowance remaining, request a modification to decrease the allowance to equal the amount that has been used.

E. If adjustments exceed, or are expected to exceed, a cumulative twenty-five percent (25%) of the initial base quantity, either party to the Contract may initiate renegotiation for a new Unit Price. New Unit Prices shall be made a part of the Contract by appropriate Modification.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 LIST OF UNIT PRICES

Item No.	Unit Price Per Unit	Unit	Name, Work Included
1		10 sq. ft.	Metal Deck
2		Linear foot	2 x 4 blocking
3		Linear foot	2 x 6 blocking
4		Linear foot	2 x 8 blocking
5		Linear foot	2 x 10 blocking
6		Linear foot	2 x 12 blocking
7		Sheet	¾" plywood
8		Sheet	½" plywood
9		15 sq. ft.	Tectum deck repair (panel 3 inch thick assumed- to be confirmed on site during removal)
10		10 sq. ft.	Gypsum deck repair
11		100 Linear foot	Masonry tuck point
12		10 foot	Wood deck repair (1x6 & 1x8)
13		10 sq. ft.	LWC deck repair

END OF SECTION 01 22 00

SECTION 01 23 00
ALTERNATES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Each Alternate is identified by number and describes the basic changes to be incorporated into the Work if a particular alternate is made a part of the work by specific provisions in the Agreement between the Owner and the Contractor.

1.02 RELATED REQUIREMENTS

A. Related Sections are referenced in the definition of each Alternate.

1.03 PROCEDURE

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

B. Coordination of related work and modifications to surrounding work as required to properly integrate each Alternate, and to provide the complete construction required by the Contract Documents, is the responsibility of the Contractor.

1.04 DESCRIPTION OF ALTERNATES:

A. Alternate No. 1: Gym walls wrapped with membrane - Remove membrane. Replace with fluid-applied AWB and metal panels above roof. Replace damaged fascia.
   1. Base Bid Item: Drawing number A1.52.

B. Alternate No. 2: Northeast regional office, Shelby County Schools Tectum Deck, nail base - Base layer min. R30. 1/4 inch per 12 inch slope to drain. Contractor shall confirm scupper and drain height to deck. 1/8 inch taper permitted if fully adhered EPDM.
   1. Base Bid Item: Drawing number A1.50.

C. Alternate No. 3: RF-4, RF-5, RF-6 - 1/2 inch CDX plywood attached to existing deck. Include all fastening for 72 MPH wind load.
   1. Base Bid Item: Drawing number G0.02.

PART 2 – MATERIALS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 23 00

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SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements for handling and processing contract modifications.

1.02 RELATED REQUIREMENTS

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

B. Section 01 33 00 - Submittals for requirements for the Contractor's Construction Schedule.

C. Section01 20 00 - Applications for Payment for administrative procedures governing Applications for Payment.

D. Section 01 60 00 - Products for administrative procedures for handling requests for substitutions made after award of the Contract.

1.03 REFERENCE STANDARDS

A. AIA G701 - Change Order; 2017.

B. AIA G709 - Proposal Request; 2018.

C. AIA G714 - Construction Change Directive; 2017.

1.04 MINOR CHANGES IN THE WORK

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

1.05 CHANGE ORDER PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of proposed changes in the work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Proposal requests issued by the Architect are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
   2. Within 5 calendar days of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Architect for the Owner's review.
      a. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include a statement indicating the effect the proposed change in the work will have on the Contract.

B. Time-Factor-Initiated Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
   1. Include a statement outlining the reasons for the change and the effect of the change on the work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
   2. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
   3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Comply with requirements in Section 01 60 00 - Products if the proposed change requires substitution of one product or system for a product or system specified.

C. Proposal Request Form: Use AIA G709 or similar for Change Order Proposal Requests.

1.06 CONTINGENCY

A. Contractor shall hold a 10% Owner Contingency in Contract to address the cost of any changes in the work. Any proposed deductions from the Owner Contingency will be submitted to the Owner and Architect for approval and shall include all supporting information to substantiate the cost and quantities indicated.

1.07 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Architect may issue a Construction Change Directive on AIA G714. The Construction Change Directive instructs the Contractor to proceed with a change in the work, for subsequent inclusion in a Change Order.
   1. The Construction Change Directive contains a complete description of the change in the work. It also designates the method to be followed to determine change in the Contract Sum or 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 the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.08 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Proposal Request, the Contractor shall issue a Change Order for signatures of the Owner and the Architect on AIA G701.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 26 00

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:
   1. General project coordination procedures.
   2. Conservation.
   3. Coordination Drawings.
   4. Administrative and supervisory personnel.
   5. Cleaning and protection.

1.02 RELATED REQUIREMENTS

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

B. Section 01 31 19 - Project Meetings for progress meetings, coordination meetings, and preconstruction conferences.

C. Section 01 33 00 - Submittals for preparing and submitting the Contractor's Construction Schedule.

D. Section 01 77 00 - Closeout Procedures for coordinating contract closeout.

E. See plans for additional coordination requirements especially coordination with other construction contracts and utility contracts associated with development of this project.

1.03 COORDINATION

A. Coordinate construction operations included in various Sections of these Specifications to ensure efficient and orderly installation of each part of the work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components to ensure maximum accessibility for required maintenance, service, and repair.
   3. Make provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Project closeout activities.

D. Conservation: Coordinate construction operations to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
   1. Salvage material and equipment involved in performance of, but not actually incorporated in, the work.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Coordination Drawings: Contractor shall prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.
   1. Show the relationship of components shown on separate Shop Drawings.
   2. Indicate required installation sequences.

C. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments to the Architect, Owner, and Owner's Consultant, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers.
   1. Contractor shall comply with county personnel registration requirements for all personnel accessing secure facilities during school hours.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL COORDINATION PROVISIONS

A. Coordinate scheduling, submittals, and work of the various Sections of Specifications to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Coordinate completion and cleanup of work of separate Sections in preparation for Substantial Completion and for portions of work designated for Owner's partial occupancy.

C. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner’s activities.

3.02 CLEANING AND PROTECTION

A. See Section 01 74 00 - Cleaning for additional requirements.

B. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

C. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period.

D. Remove all sharp and metallic objects including fasteners, equipment, and debris from completed roof membranes and insulation to prevent damage to membrane.

E. Protect completed roof membrane from chemicals, adhesives, and sealants. Clean and remove any spills or stains to new membrane.

F. Protect the new membrane from construction activities. Use sacrificial layers such as protection board or slip sheets under all equipment, material, and at locations of high traffic.

G. All stored material shall be placed on dunnage. Do not store metallic items, lumber, or chemicals on the finished roof surface.

H. Replace any portion of membrane damaged during the execution of the work.

I. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION 01 31 00

SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
   1. Pre-bid meeting.
   2. Preconstruction conferences.
   3. Progress meetings.
   4. Coordination meetings.

1.02 RELATED SECTIONS

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

B. Section 01 31 00 - Project Management and Coordination for procedures for coordinating project meetings with other construction activities.

C. Section 01 33 00 - Submittals for submitting the Contractor's Construction Schedule.

D. Section 01 77 00 - Closeout Procedures for additional coordination requirements.

E. Division 07 Sections for preconstruction roofing conferences.

1.03 PRE-BID MEETING

A. Architect will schedule a pre-bid conference at the Project Site prior to bid to review the project scope of work, procedures, and unique project conditions, and to respond to Contractor questions.

B. Attendees: Authorized representatives of the Owner, Architect, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the project and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress, including the following:
   1. Tentative construction schedule.
   2. Critical work sequencing.
   3. Designation of responsible personnel.
   4. Procedures for processing field decisions and Change Orders.
   5. Procedures for processing Applications for Payment.
   6. Distribution of Contract Documents.
   7. Submittal of Shop Drawings, Product Data, and Samples.
   8. Preparation of record documents.
   9. Use of the premises.
   10. Parking availability.
   11. Office, work, and storage areas.
   12. Equipment deliveries and priorities.
   13. Safety procedures.
   14. First aid.
   15. Security.
   16. Housekeeping.
   17. Working hours.
   18. Channels and procedures for communication.

1.04 PRECONSTRUCTION CONFERENCES

A. Contractor shall schedule a preconstruction conference before each construction activity that requires coordination with other construction before starting construction, at a time convenient

to the Owner, Owner's Consultant, and the Architect, but no later than 15 days after execution of the Agreement. Hold the conference at the Project Site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

B. Attendees: The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect of scheduled meeting dates.
   1. Agenda: Contractor shall prepare an agenda for the preconstruction meeting reviewing procedures and items of significance that could affect progress. Include topics for discussion as appropriate to the status of the project. Review the progress of other construction activities and preparations for the particular activity under consideration at each preconstruction conference, including requirements for the following:
      a. Contract Documents.
      b. Options.
      c. Related Change Orders.
      d. Purchases.
      e. Deliveries.
      f. Shop Drawings, Product Data, and quality-control samples.
      g. Review of mockups.
      h. Possible conflicts.
      i. Compatibility problems.
      j. Time schedules.
      k. Weather limitations.
      l. Manufacturer's recommendations.
      m. Warranty requirements.
      n. Compatibility of materials.
      o. Acceptability of substrates.
      p. Temporary facilities.
      q. Space and access limitations.
      r. Governing regulations.
      s. Safety.
      t. Inspecting and testing requirements.
      u. Required performance results.
      v. Recording requirements.
      w. Protection.
   2. Record significant discussions, agreements, and disagreements of each conference, and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner, Owner's Consultant, and the Architect.
   3. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to the performance of Work and reconvene the conference at the earliest feasible date.

1.05 PROGRESS MEETINGS

A. Conduct progress meetings at the Project Site every two weeks (on a bi-weekly basis). Notify the Owner, Owner's Consultant, and the Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.

B. Attendees: In addition to representatives of the Owner and the Architect, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the work.
   1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.

C. Agenda: Contractor shall prepare an agenda for all progress meetings to itemize topics for discussion; review and correct or approve minutes of the previous progress meeting; or review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the project.
   1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   2. Review the present and future needs of each entity present, including the following:
      a. Interface requirements.
      b. Time.
      c. Sequences.
      d. Status of submittals.
      e. Deliveries.
      f. Off-site fabrication problems.
      g. Access.
      h. Site utilization.
      i. Temporary facilities and services.
      j. Hours of work.
      k. Hazards and risks.
      l. Housekeeping.
      m. Quality and work standards.
      n. Change Orders.
      o. Documentation of information for payment requests.

D. Reporting: No later than 3 days after each meeting, distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
   1. Schedule Updating: Revise the Contractor’s Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.
   2. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.
   3. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
   4. Challenge to minutes shall be settled as a priority portion of “old business” at the next regularly scheduled meeting.

E. Decisions, instructions, and interpretations given by the Architect or his representative at these meetings shall be binding and conclusive to the Contractor.

1.06 CONTRACT CLOSEOUT MEETING

A. Contractor shall conduct a contract closeout meeting at the project site within 30 days after Substantial Ccompletion.

B. Attendees – Authorized representatives of the Owner, Owner's Consultant, Architect, Contractor, and any other personnel involved in maintenance and operation of all systems in the project.

C. Agenda – Discuss items of significance affecting contract closeout:
   1. Request for Final Inspection.
   2. Final change orders and contingency allowance.
   3. Project record documents, operations, and maintenance.
   4. See Section 01 77 00 - Closeout Procedures for additional requirements.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 31 19

SECTION 01 32 16
CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. SCHEDULE(S): A schedule shall be provided as a basis for a detailed construction schedule. The detailed construction schedule shall conform to the construction sequence as outlined in other sections of these specifications.

B. DESCRIPTION: Utilize a computer-generated schedule for the planning and scheduling of all work required under the Contract Documents. In addition to construction activities, detailed network activities shall include the submittal of shop drawings, catalog cut sheets, and materials samples, review and approval of these submittals, and fabrication and delivery of materials and equipment. Work by separate contractors and project close-out activities shall also be included to account for their effect on the overall sequencing of the project.

1.02 RELATED REQUIREMENTS

A. Section 01 20 00 - Applications for Payment.

B. Section 01 33 00 - Submittals.

C. Section 01 31 19 - Project Meetings.

1.03 REFERENCE STANDARDS

A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.

B. M-H (CPM) - CPM in Construction Management - Project Management with CPM; 2015.

1.04 SCHEDULE STANDARDS

A. The schedule shall demonstrate a logical succession of work from start to finish. Constrained start and finish dates shall be kept to a minimum, such that the schedule logic (activity relationships and durations) will determine the schedule start and finish of each activity.

B. The durations indicated for each activity shall be in "work - days" and shall represent the required time for the activity considering the scope of work and resources planned for the activity including time for inclement weather and other predictable delays.

C. Multiple calendars shall be utilized as required to allow for specific times of the week, month, or year when specific activities can or cannot be accomplished. Specific examples include, but are not necessarily limited to, Site Based (School) activities which require no noise such as school testing timeframes, and other site-based activities which require same considerations, confirm with the Architect, Construction Procurement Department, Owner, and Owner's Consultant regarding additional timeframes which require Site Based (School) activities to take priority over various parts of this Project.

1.05 PROJECT SCHEDULE

A. Estimated Project Schedule for Substantial Completion: 180 days (9 months).
   1. Estimated schedule is represented in calendar days, not working days.
   2. Weather delays are not included.

B. Estimated Project Schedule for Final Completion: 210 days (10 months).
   1. Estimated schedule is represented in calendar days, not working days.
   2. Weather delays are not included.

1.06 LIQUIDATED DAMAGES

A. Liquidated Damages (if Substantial Completion Date is missed): The Owner, in cases of delay, has the right to assess Liquidated Damages (LD) against the Contractor. The parties also recognize the delays, expenses, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as LD for

delay (but not as a penalty), Contractor shall pay Owner as follows for each day that the project extends past the Substantial Completion Date established in the Detailed Construction Sequence.

1. Total Per Day: $500.00.
2. Item: Daily Cost.

B. Liquidated Damages (if Final Completion Date is missed): The Owner, in cases of delay, has the right to assess Liquidated Damages (LD) against the Contractor. The parties also recognize the delays, expenses, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as LD for delay (but not as a penalty), Contractor shall pay Owner as follows for each day that the project extends past the Final Completion Date established in the Detailed Construction Sequence.

1. Total Per Day: $500.00.
2. Item: Daily Cost.

1.07 QUALIFICATIONS

A. Submit evidence of in-house scheduling capability per Owner’s Requirements for Project Scheduling.

B. Verify in-house capability by description of this project to which Contractor or Contractor's consultant has successfully applied scheduling techniques for this Project. Include one (1) project which was controlled throughout the duration of the project by means of computerized, periodic, systematic schedule.

C. Submit the requirements of the Section to the Architect, Engineer, Owner, and Owner's Consultant with the Contractor’s Bid Documents.

PART 2 - PRODUCT

2.01 GENERAL

A. Provide Architect, Owner, and Owner's Consultant with required number and product information as identified within other Sections of these Specifications.

PART 3 - EXECUTION

3.01 GENERAL

A. Prepare a computer-generated schedule of all construction-related work required by this contract.

B. Include the following information in the database for each activity:

1. Activity Description - should indicate type of work being performed and general location or phase.
2. Calendar - the standard calendar is a five (5) day work week. Other calendars have been determined including school year, vacation, student relocation, etc.
3. Duration - should indicate "work - days" required to accomplish the task.
4. Schedule Dates - Early Start, Early Finish, Late Start, and Late Finish for each activity will result from the calculation of the schedule.

3.02 SCHEDULE PROCEDURE

A. Time of Submittals

1. Within five (5) working days after Notice to Proceed, the Contractor shall submit its project schedule for review. The schedule produced and submitted shall indicate interim milestone and completion dates identical to the milestones required by the contract. The Architect, Owner, and Owner's Consultant will review the schedule within ten working days and state acceptance or rejection of the schedule.
2. Within ten working days after the conclusion of the Architect’s, Owner’s, and the Owner's Consultant’s review, the Contractor shall revise the schedule as required and resubmit. This schedule shall constitute the project Work schedule unless a revised schedule is

required due to substantial changes in work or contract time, delinquency by the Contractor requiring a recovery schedule, or as otherwise provided.
   a. Acceptance of the project schedule will be required prior to the processing of any Application for Payment.
3. Submit a copy of the schedule, clearly showing progress made during the previous month along with the Application for Payment.

B. Acceptance of Schedule
1. The schedule will be acceptable when it provides an orderly progression of the work to completion in accordance with the contract requirements, adequately defines the Contractor's work plan, and provides a workable arrangement for the processing of submittals in accordance with the requirements.
2. Review and acceptance of the Contractor's project schedule is for conformance to the requirements of the contract documents only. It does not relieve the Contractor of any responsibility for the accuracy or feasibility of the project schedule, or of the Contractor's ability to meet the interim milestone dates and contract completion date, nor does such review and acceptance expressly or implicitly warrant, acknowledge, or otherwise admit the reasonableness of the logic or durations of the Contractor’s project schedule.

C. Submittal Items
1. Initial submittals shall include the following:
   a. Bar Chart Graphic Report - include all activities for the entire project. Sort by early start, early finish, and total float; organize by submittal activities, construction activities, etc. Include activity ID, description, original duration, early start, early finish, and total float. Individual pages shall not exceed 11 inches by 17 inches.
   b. Back-up - A full electronic copy of the schedule shall be submitted at each update containing all activities and logic along with a pdf copy formatted legibly for review.
   c. Reports shall be submitted digitally to the Architect, Owner, and Owner's Consultant.
2. Monthly submittals to be included with Application for Payment shall include the following:
   a. Project Narrative Report - shall include a brief description of work that was accomplished during the previous month as well as work to be pursued during the upcoming month.
   b. Bar Chart Graphic Report - shall be a three-month (3) look ahead schedule to include previous month's progress plus work to accomplish during the two months following the data date. Schedule bars shall be compared to the initial schedule as a baseline. Include the same activity information as in initial bar chart graphic report.
   c. Back-up - A full electronic copy of the schedule shall be submitted at each update containing all activities and logic along with a pdf copy formatted legibly for review.
   d. Reports shall be submitted digitally to the Architect, Owner, and Owner's Consultant.

D. Schedule Revisions
1. No changes may be made in the sequence, duration, or relationship of any activity without the acceptance of the Owner. Requests for minor changes to the schedule may be submitted in the form similar to the schedule form identified herein. More substantial revisions will require re-submittal of the entire schedule.
2. If at any time the Architect, Owner, and Owner's Consultant considers the milestone or completion dates to be in jeopardy because of work activities behind schedule, the Contractor shall provide a revised Critical Path Work Schedule, including resource requirements, to show how the Contractor intends to bring the project back on schedule. “Activities Behind Schedule” are any activities whose current scheduled early dates are later than indicated in the initial schedule.
3. If a change directive has a schedule impact, that impact shall be submitted with the change directive request in the form of a fragment that adequately indicated the effect of the change on the original schedule. If a fragment cannot adequately delineate the schedule impact, re-submittal of the entire schedule may be required.

3.03 SCHEDULE MAINTENANCE

A. Updating the Schedule at not less than one (1) month intervals, or when specifically requested by the Architect, Owner, or Owner's Consultant, the Contractor shall perform a schedule update. Progress of the project shall be evaluated as of the last Sunday of the month (the data date). The updating process shall evaluate the status of each activity, noting actual start dates, actual finish dates, and remaining durations. After this data is input the schedule shall be calculated as of the data date. It is suggested that due to the nature of these projects, the Contractor perform a mid-month update as well, to assure that the project does not fall behind schedule.

B. Schedule Monitoring - The updated schedule shall be utilized for the monthly reports as required under “Submittals.” Monthly updates will be compared to the original (baseline) schedule and the previous month's update to evaluate progress.

C. Progress Meetings - For the progress meetings held every other week (Bi-weekly), the Contractor shall prepare a three (3) week look-ahead schedule based on the latest updates of the schedule. This three-week schedule shall show all activities in progress, uncompleted, or scheduled to be worked on during the three-week period. The three weeks shall include the current week plus the next two (2). The purpose of the meetings is to review the progress of work and resolve potential problems to avoid delays.

END OF SECTION 01 32 16

SECTION 01 32 33
CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Still Photography.

B. Prints.

C. Submittals.

1.02 RELATED SECTIONS

A. Section 01 10 00 - Summary of Work.

B. Section 01 33 00 - Submittals.

C. Section 01 77 00 - Closeout Procedures.

D. Section 01 20 00 - Applications for Payment.

1.03 PHOTOGRAPHY

A. Still Photography
   1. Existing Conditions: Provide Photographs of site and existing buildings (interior and exterior) before any construction is started. This includes the surrounding streets and sidewalks and other areas that could be damaged by construction traffic for this project.
   2. Progress Photographs: Take photographs of work associated with each monthly Application for Payment. Include with roof plan highlighting the progress of installations.

B. Prints
   1. Digital prints are acceptable in PDF format.
   2. Paper: white base
   3. Size: 3-1/2” x 5” inch
   4. Identify each print on back on below image with Name of Project, Contract Number, Phase, Orientation of View, Date and Time of View.

1.04 TECHNIQUE

A. Provide Factual Presentation.

B. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

C. Provide monthly progress photographs from views until Substantial Completion. Consult with Architect for instructions on views required.

1.05 SUBMITTALS

A. Provide PDF digital documentation of all images.

B. Deliver prints of Existing Conditions within 10 days of NTP.

C. Deliver prints of progress photographs with each Application for Payment.

PART 2 – MATERIALS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 32 33

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SECTION 01 33 00
SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including but not limited to the following:
   1. Contractor's Construction Schedule.
   2. Submission of Progress Schedule.
   3. Submittal Schedule.
   4. Shop Drawings.
   5. Product Data.
   6. Samples.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Owner's Contract for Construction and other Part - 1 Specification Sections apply to this Section.

1.03 ADMINISTRATIVE SUBMITTALS

A. Refer to other Part - 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
   1. Permits.
   2. Applications for Payment.
   3. Performance and payment bonds.
   4. Insurance certificates.
   5. List of subcontractors.

B. Progress Reports:
   1. Daily Reports:
      a. Progress reports shall be kept on a daily basis to cover each facet of the work. These reports shall be kept on file at the field office and shall be made available for review upon request of the Engineer/Architect or his representative.

C. Proposed Products List:
   1. Within 20 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number for each product.
   2. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.04 ACTION SUBMITTALS

A. Written and graphic information and physical samples that require Company representative's responsive action.
   1. Submittals shall be rejected for not complying with requirements.

1.05 INFORMATIONAL SUBMITTALS

A. Written and graphic information and physical samples that do not require responsive action.
   1. Submittals shall be rejected for not complying with requirements.

1.06 SUBMITTAL PROCEDURES

A. Coordination
   1. Contractor shall submit a submittal schedule identifying the anticipated date each submittal will be received by the design team.
   2. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

3. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
4. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
    a. The Engineer/Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
    b. Allow 2 weeks for processing each submittal. Allow additional time if the Engineer/ Architect must delay processing to permit coordination with subsequent submittals.
    c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer/Architect sufficiently in advance of the Work to permit processing.

B. Submittal Preparation
1. Contractor shall review each submittal prior to submitting for review by Owner, Owner's Consultant, and Architect.
2. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block. Include Contractor comments, return to the supplier or subcontractor for revision until deemed acceptable by the Contractor prior to submitting to the Owner, Owner's Consultant, and Architect.

C. Submittal Transmittal
1. Transmit each submittal from the Contractor to the Architect/Engineer using a transmittal form.
2. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations.
3. Submittals may be submitted via email. If submitted via email, Contractor to use Project School Name, (i.e. Keystone) in the subject line along with product/submittal name or division number. No exceptions.

1.07 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. See Section 01 32 16 - Construction Schedule for additional requirements.

B. Bar-Chart Schedule
1. Prepare a fully developed, horizontal bar-chart-type, Contractor's construction schedule for acceptance of Owner and Owner's Consultant. Submit within 30 days after the date established for "Commencement of the Work."
2. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values."
3. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
4. Indicate completion in advance of the date established for Substantial Completion.
5. Indicate Substantial Completion on the schedule.

C. Distribution
1. Following acceptance of the formatting of the initial submittal, print and distribute copies to the Engineer/Architect, Owner, Owner's Consultant, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
2. When revisions are made, distribute to the same parties as required.

D. Schedule Updating

1. Revise the schedule monthly. Revised Schedules should reflect each event or activity where approved revisions have been recognized or made. Issue the updated schedule in reduced form for attachment to the Minutes of each Progress Meeting.
2. A two-week look ahead schedule shall be provided by the Contractor for review at all OAC meetings.

1.08 SUBMITTAL AND PRECONSTRUCTION SCHEDULE

A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within 7 calendar days of the date required for submittal of the Contractor's Construction Schedule.
   1. Prepare the schedule in chronological order, and include submittals required during the first 90 days of construction. Provide the following information:
      a. Scheduled date for the first submittal.
      b. Name of the subcontractor.
      c. Scheduled date for the Engineer/Architect's final release or approval.

B. Distribution
   1. Following response to the initial submittal, print and distribute copies to the Engineer/Architect, Owner, Owner's Consultant, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

1.09 SHOP DRAWINGS

A. Submit shop drawings, product data, samples, and other submittals where required in other sections of this document.

B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates, and similar Drawings. Include the following information:
   1. Dimensions.
   2. Identification of products and materials included by sheet and detail number.
   3. Compliance with specified standards.
   4. Notation of coordination requirements.
   5. Notation of dimensions established by field measurement.
   6. One (1) of the prints returned shall be marked up and maintained as a "Record Document."

C. One (1) print of each Drawing and one sample bearing the final approval stamp of the Engineer/Architect shall be kept at the project office and shall be maintained in good condition. No Shop Drawing or sample other than those stamped “Approved,” shall be on the job for any purpose whatsoever, and work installed directly from shop Drawings or samples shall be removed and corrected at no charge in contract price.

D. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

E. In checking Shop Drawings and samples, the Engineer/Architect shall not be required to check dimensions, quantities, electrical characteristics, specific capacities, or coordination with other trades, these being the responsibility of the Contractor. The Contractor shall attest, either in writing or by stamp or signature, that all Shop Drawings and samples submitted for approval have been checked for compliance with the Drawings and Specifications prior to submission to the Engineer/Architect. Otherwise, they will be returned unchecked. Any deviations in Shop Drawings shall be identified by letter accompanying Drawings. No Shop Drawings nor samples shall be submitted directly to the Engineer/Architect from a manufacturer, jobber, or subcontractor.

1.10 PRODUCT DATA

A. See Section 01 60 00 - Products for additional requirements.

B. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, performance curves, and Material Safety Data Sheets (MSDS) .
   1. For the appropriate purchases, all Material Safety Data Sheets (MSDS) must accompany all shipments covered under Tennessee Hazardous Chemical Right to Know Law - Tennessee Public Chapter #417 - House Bill #731.
   2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

C. Submittals:
   1. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
   2. Contractor may submit electronic copy of submittal if acceptable by Architect or Engineer.

D. Distribution
   1. Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
   2. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
   3. Do not permit use of unmarked copies of Product Data in connection with construction.

1.11 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
   1. Include the following:
      a. Sample source.
      b. Product name or name of the manufacturer.
      c. Compliance with recognized standards.
      d. Availability and delivery time.
   2. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual components as delivered and installed.
   3. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit multiple units (not less than 3) that show approximate limits of the variations.

B. Preliminary Submittals:
   1. Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from a range of standard choices.
   2. The Architect or Engineer will review and return preliminary submittals with the Architect or Engineer mark, indicating selection and other action.

C. Submittals:
   1. Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit three (3) sets. The Architect or Engineer will return one set marked with the action taken.
   2. Maintain sets of Samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.
   3. Sample sets may be used to obtain final acceptance of the construction associated with each set.

D. Distribution of Samples:
   1. Prepare and distribute additional sets as required for performance of the Work.

E. Design Data
   1. Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations.

F. Coordinate preparation and processing of submittals with performance of construction activities. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity. Allow time for submittal review, including time for resubmittals.

1.12 ARCHITECT/ENGINEER'S ACTION

A. Except for submittals for the record or information, where action and return is required, the Engineer/Architect will review each submittal, mark to indicate action taken, and return promptly.
   1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp
   1. The Engineer/Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp of the Engineer/Architect on returned Shop Drawings and samples shall be interpreted as follows:
      a. Approved: Conforms to design concept of the project.
      b. No Exceptions Noted: Conforms to design concept of the project.
      c. Approved as Noted: Items noted for correction must not be fabricated or furnished with correction as noted.
      d. No Exceptions Taken Revised As Noted: Items noted for correction must not be fabricated or furnished without correction as noted.
      e. If the above comments are offered Fabrication/ Installation may be undertaken.
      f. Revise and Resubmit or Rejected: The item is rejected as not in accordance with the contract requirement, or for other justified cause. The submission shall be corrected and resubmitted. No item is to be fabricated or furnished under this stamp.
      g. If the above comments are offered Fabrication and/or Installation may not be undertaken.

1.13 LIST OF SUBCONTRACTORS

A. Submit list of subcontractors as required by Section 00 21 13 - Instruction to Bidders.

1.14 OCCUPANCY PERMIT

A. Submit Occupancy Permit as required by Section 01 77 00 - Closeout Procedures.

B. Other Submittals (Where Applicable)
   1. Shop Drawings and drawings, diagrams, illustrations, schedules, performance charts, nomenclature charts, brochures, and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier, fabricator, or distributor and which illustrate some portion of the project.

1.15 REQUIRED SUBMITTALS

A. Submittals required by the Contract Documents include, but are not necessarily limited to:
   1. Proposed Progress Schedule.
   2. Schedule of Values.
   3. List of Subs and Suppliers.
   4. Construction Waste Management Plan.
   5. Contract Closeout Items.
   6. Project Record Documents.
   7. Manuals.
   8. Product Data, Mix Designs.

9. Product Data, Shop Drawings.
10. Steel Shop Drawings.
11. Concrete Mixes.
12. Masonry.
13. Storefront Systems.
14. Curtain Wall Systems.
15. Door, Frame & Hardware.
16. All Material & Finishes.
17. Plumbing Systems.
18. Fire Protection Systems.
19. HVAC Systems.
20. Electrical Lighting.
21. Electrical Power Systems.
22. Electrical Life Safety Systems.

B. Refer to individual product Specification Sections for additional required submittals.

C. After review, reproduce and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01 78 39 - Project Record Documents.

D. Provide Owner and Owner's Consultant with one (1) Electronic USB in AutoCAD DWG FILE Format of ALL As-Built Documents USB MUST NOT BE READ ONLY. USB MUST BE AN AUTO CAD DWG FILE FOR Owner PURPOSES AND RECORDS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SUBMITTALS REQUIRED BEFORE OR WITH FIRST INVOICE:

A. Construction Schedule.

B. List of Subcontractors and Suppliers.

C. Staging Area(s) for Contractor’s Equipment, Materials, Appurtenance(s), Products, Contractor’s Circulation Pattern(s) to and from Staging Areas to avoid interface and impact with Owner’s Site Based Personnel and all persons related to Site Based Personnel.

D. Contractor’s Documents showing ALL Safe travel zones for ALL Site Based Persons prior to, during, and following ingress to the Project Site and Project Building and egress from the Project Site and Project Building.

E. Contractor to show ALL safety fencing necessary to separate ALL Site Based Persons and ALL Persons related to Site Based Persons from Contractor’s Work Areas/Zones.

3.02 SHOP DRAWINGS

A. Shop drawings shall be submitted for review and comments as noted under all sections listed.

B. Miscellaneous Submittals Required:
1. Inspection and Test Reports.
2. Warranties.
3. Survey Data.

3.03 CLOSE-OUT DOCUMENTS BEFORE FINAL INVOICE

A. Refer to Section 01 77 00 - Closeout Procedures and to individual Sections of these Specifications for specific submittal requirements of project closeout information, materials, tools, and similar items.

END OF SECTION 01 33 00

SECTION 01 40 00
QUALITY CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Quality assurance and control of installation.

B. References.

C. Field samples.

D. Mock-ups.

E. Inspection and testing laboratory services.

F. Manufacturers' field services and reports.

1.02 RELATED SECTIONS

A. Section 01 33 00 - Submittals for submission of Manufacturers' Instructions and Certificates.

B. Section 01 45 23 - Laboratory Testing and Field Inspection.

C. Section 01 60 00 - Products for requirements for material and product quality.

1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer, Owner, and Owner's Consultant before proceeding with work.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.04 REFERENCES

A. Conform to reference standard by date of issue current on date of Contract Documents.

B. Obtain copies of standards when required by Contract Documents.

C. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 FIELD SAMPLES AND MOCKUPS

A. Install field samples and mockups at the site as required by individual Specification Sections for review.

B. Acceptable samples and mockups represent a standard quality level for the Work represented.

C. Notify Owner, Owner's Consultant, and Architect of field sample and mockup installation schedule a minimum of 5 days prior to installation. All samples and mockups to be reviewed by Architect, Owner, and Owner's Consultant for compliance with drawings and specifications. Contractor shall correct any defects in workmanship, material, or installation and request follow up review by Architect, Owner, and Owner's Consultant. Acceptance of mockups and samples by Architect, Owner, and Owner's Consultant is required prior to proceeding with full installation and procurement.

D. Where field samples or mockups are specified in individual Sections to be removed, clear area after field sample has been accepted by Architect/Engineer, Owner, and Owner's Consultant.

1.06 INSPECTION AND TESTING LABORATORY SERVICES

A. Contractor shall appoint, employ, and pay for services of an independent firm approved by the Architect/Engineer, Owner, and Owner's Consultant to perform inspection and testing.

B. The independent firm will perform inspections, tests, and other services specified in these specification Sections and as required by the Architect, Owner, and Owner's Consultant.

C. Reports will be submitted by the independent firm to the Owner, the Owner's Consultant, Architect, and any other parties deemed by the Architect and Owner, digitally, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents or information issued by the Architect, Owner, and Owner's Consultant.

D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, and assistance as requested.
   1. Notify Architect/Engineer and independent firm 72 hours prior to expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect/Engineer. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the Contract Sum/Price.

1.07 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. Observer subject to acceptance of Architect/Engineer, Owner, and Owner's Consultant.

B. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, test(s), and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report within 30 days of observation to Architect/Engineer, Owner, and Owner's Consultant for review.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 40 00

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 CODES AND REGULATIONS

A. The Regulatory Requirements used for Tennessee Board of Regents projects are listed below as a convenience and may not be inclusive of all that apply. Others may also apply. Contractor shall comply with all pertinent codes, standards, regulations, and laws.
   1. 1. 29 CFR 1910 - Occupational Safety and Health Standards; current edition; as a workplace.
   2. 2. Tennessee State Fire Marshal Codes:
      a. 2021 International Building Code (Except: Chapter 11 & 3411).
      b. 2018 International Existing Building Code.
      c. 2017 National Electrical Code.
      d. 2018 International Fuel Gas Code.
      e. 2012 International Mechanical Code.
      f. 2012 International Plumbing Code.
      g. 2012 International Energy Conservation Code.
      h. 2012 International Fire Code.
      i. 2012 NFPA-101: Life Safety Code.
      j. United States Department of Justice: 2010 ADA Standards for Accessible Design, Title III Regulations 28 CFR Part 36 - For Public Buildings.
   3. Local Codes:
      a. 2021 International Building Code (W/ Local Amendments).
      b. 2021 International Existing Building Code (W/ Local Amendments).
      c. 2020 National Electrical Code (W/ Local Amendments).
      d. 2021 International Fuel Gas Code (W/ Local Amendments).
      e. 2021 International Mechanical Code (W/ Local Amendments).
      f. 2021 International Plumbing Code (W/ Local Amendments).
      g. 2021 International Energy Conservation Code (W/ Local Amendments).

1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Control.

1.03 QUALITY ASSURANCE

A. Designer Qualifications: Where delegated engineering design is to be performed under the construction contract, provide the direct supervision of a Professional Engineer experienced in design of this type of work and licensed in Tennessee.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 41 00

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SECTION 01 45 23
LABORATORY TESTING AND FIELD INSPECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Employment and payment of an independent testing laboratory for specified services shall be by the Contractor. This laboratory will perform all testing and inspection required by the specifications.

B. Payment: The Contractor shall be reimbursed for any additional testing required by AHJs which are not required by the Specifications.

1.02 REFERENCE STANDARDS

A. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.

B. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2023.

C. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 TESTING REQUIRED

A. All Special Inspections required by:
   1. ICC (IBC) International Building Code.
   2. Memphis and Shelby County Office of Construction Code Enforcement.
   3. Tennessee State Fire Marshal’s office.

B. Special Inspection Testing required per Sheet S0.1 and S0.2 in Drawings.

C. Concrete under Division 03 - Concrete.

D. Mortar and masonry under Division 04 - Masonry.

E. Steel welding under Division 05 - Metals.

F. Fireproofing under Division 07 - Thermal and Moisture Protection.

G. Windows under Division 08 - Openings.

H. Storefronts under Division 08 - Openings.

I. Curtain wall under Division 08 - Openings.

J. Sealants under Division 07 - Thermal and Moisture Protection.

K. Waterproofing under Division 07 - Thermal and Moisture Protection.

1.04 LABORATORY QUALIFICATIONS

A. Must meet "Recommended Requirements for Independent Laboratory Qualifications" as published by the American Council of Independent Laboratories.
   1. Must meet basic requirements of:
      a. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
      b. ASTM E329 – Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction.
   2. Laboratory shall maintain a full-time registered engineer on staff to review services.
   3. Authorized to operate in the state where construction work is located.

B. Laboratory Duties

1. Shall cooperate with Owner, Owner's Consultant, Architect/Engineer and Contractor; provide qualified personnel after due notice by the Contractor of work requiring testing and/or inspection is given.
2. Shall perform specified inspection, sampling, and testing of materials and methods of construction:
   a. Comply with specified standards in technical sections.
   b. Ascertain compliance of materials with requirements of Contract Documents.
3. Promptly notify Owner, Owner's Consultant, Architect/Engineer, and Contractor of observed irregularities or deficiencies of work or products. If irregularities or deficiencies continue at the job site, continue to notify Owner, Owner's Consultant, Architect/Engineer, and Contractor so that a “Stop Work Order” may be issued.
4. Promptly submit a digital copy of written reports of each test and inspection to Architect/Engineer, Contractor, Owner, Owner's Consultant, and one (1) copy for Record Documents File. Each report shall include:
   a. Issue date.
   b. Project date.
   c. Testing laboratory name, address and telephone number.
   d. Name and signature of engineer and laboratory inspector or technician.
   e. Date and time of sampling or inspection.
   f. Record of temperature and weather conditions.
   g. Date of testing.
   h. Location of sample or test in project.
   i. Results of tests and compliance with Contract Documents.
5. Perform additional tests as required by the Architect/Engineer and/or the Owner and Owner's Consultant. The Contractor shall, at his expense, provide proper access, furnish necessary representative samples and, if required, deliver them to the testing agency when and where directed. Additional cost for the above will be paid as follows:
   a. Tests for Owner’s knowledge not relating to quality shall be paid by the Owner.
   b. Test for the quality of work may be ordered by the Owner to confirm work complies with the contract documents; if test confirms work to be as specified, it shall be paid by the Owner. If test confirms work to be not as specified, it is to be paid by the Contractor at fault per Article 13.5.3 of the General Conditions.

C. Limitations of Testing Laboratory Authority
   1. Laboratory is not authorized to:
      a. Release, revoke, alter, or enlarge on requirements of Contract Documents.
      b. Approve or accept any portion of the work.
      c. Perform any duties of the Contractor.

1.05 CONTRACTOR’S RESPONSIBILITIES

A. Cooperate with laboratory personnel and provide access to work or to the manufacturer’s operations as specified in each technical section of these specifications.

B. Secure and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.

C. Furnish copies of manufactured products test reports, as required.

D. Furnish incidental labor and facilities:
   1. To provide access to work to be tested.
   2. To obtain and handle samples at the project site or at the source of the product to be tested.
   3. To facilitate inspections and tests.
   4. For storage and curing of test samples, laboratory supplies, and equipment.

5. To repair test area if sample is removed from materials requiring repair or waterproof integrity.

E. Notify testing laboratory in sufficient advance of operations to allow laboratory to assign personnel and schedule test(s) required.
   1. When tests or inspections cannot be performed after such notice, reimbursement to the testing laboratory for laboratory personnel and travel expenses due to the Contractor's negligence is required.

F. Make arrangements with testing laboratory and pay for additional samples and tests required for Contractor's convenience.

1.06 REPORTS

A. The testing laboratory will provide copies of all reports to the Contractor, Architect/Engineer, Owner, and Owner's Consultant.

1.07 RETESTING

A. Retesting of areas not conforming to the specifications will be by the testing laboratory but will be at the expense of the Contractor.

1.08 RE-INSPECTION

A. Visits for re-inspection of an area will be by the testing laboratory but will be at the expense of the Contractor.

1.09 COORDINATION

A. Contractor shall coordinate with the testing laboratory to schedule tests and inspections.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 45 23

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SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for temporary services and support facilities, including utilities, construction and support facilities, security, and protection as necessary for the proper execution of the work.

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

A. NFPA 10 - Standard for Portable Fire Extinguishers; 2022.

B. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

E. PS 1 - Structural Plywood; 2023.

F. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations.
   1. Standards: Comply with NFPA 241, ANSI A10 Series standards for "Safety Requirements for Construction and Demolition" and NECA Electrical Design Library for "Temporary Electrical Facilities".
      a. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."
   2. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain certifications and permits.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Vermin Control Plan: Submit for approval the Contractor’s plan(s) for controlling vermin during construction.

C. Parking for Construction Vehicles: Submit for approval the Contractor’s and subcontractor’s plan(s) showing where the workers will park (if allowed by the Owner) their respective personal, company, and equipment vehicles while Contractor and subcontractors are working at and on the Project Site and at and around Project Site Building(s).

D. Control of Dust and Mud: Submit for approval the Contractor’s plan(s) detailing how the Contractor and subcontractors will control dust and mud. Show where dust and mud catchment point(s) will be located, where the temporary water hose will be located, and from where the temporary water and Cleaning Material Solution(s) will be piped. Detail ALL other aspects of Contractor’s plan(s).

E. Roads on Site: Submit for approval the Contractor’s plan(s) showing where the Contractor and subcontractors propose to install any Temporary Vehicle Access (if applicable and allowed by Owner) within and on the Project Site leading to, within, and exiting from the Project Site and Building(s) to perform and complete ALL work for this project.

F. Set-up and Breakdown Area(s): Submit for approval the Contractor's plan(s) showing ALL locations where Contractor and subcontractors will set up equipment, materials, products, appurtenances, etc. along with ALL drawing(s) showing ALL movement(s) of their respective equipment, materials, products, appurtenances, etc. by the Contractor and subcontractors to the respective Contractor's and subcontractor's work area(s) for this Project.

1.06 PROTECTION AND USE OF SITE

A. The Contractor shall confine operations at the site to the areas designated for his use on the Drawings. He shall not interfere with the operations of surrounding buildings and shall not unreasonably clutter the site with materials or equipment.

B. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner.

C. Should any damage occur, Contractor shall restore such to its original condition in a manner acceptable to the Owner.

D. Take adequate precautions against fire. Keep flammable material at an absolute minimum and ensure that such material is properly handled and stored. Except as otherwise provided herein, do not permit fires to be built or open salamanders to be used in any part of the work.

E. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

F. The Contractor shall call the local utility departments and Campus Physical Plant to help in identifying the location of all hidden utilities and services including security and landscape irrigation systems. Any damage to these areas, either marked or unmarked, is the responsibility of the Contractor. The Contractor shall notify the Architect, Owner, and Owner's Consultant immediately and make all attempts to repair the damage.

G. The Contractor is to protect all areas including but not limited to roofs that are under warranty, landscaping, sod and grass areas, irrigation lines and sprinkler heads, existing structures, outdoor furniture, vehicles, concrete and asphalt surfaces. Any damage to these areas is the responsibility of the Contractor and shall be repaired or replaced at the Contractor's expense.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. General: Provide new materials; if acceptable to the Architect, undamaged, previously used materials in serviceable condition may be used. Provide materials suitable for use intended.

B. Lumber and Plywood: Provide exterior type, Grade B-B High Density Concrete Form Overlay.

C. Plywood conforming to PS 1, of sizes and thickness indicated. Fire-Rated typical.

D. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

E. Water: Provide potable water approved by local health authorities.

F. Open-Mesh Fencing: Provide 11-gauge, galvanized 2-inch, chain link fabric fencing 8-feet high and galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts as required.

G. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

H. First Aid Supplies: Comply with governing regulations.

I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, class “ABC”, dry-chemical extinguishers or a combination of extinguishers of NFPA recommended classes for the exposures.

J. Temporary Heating: Provide heat, fuel, and services as necessary to protect all work and materials against injury from dampness and cold until final acceptance of all work and materials in the contract. The Contractor shall provide heat as follows:
   1. At all times during the placing, setting, and curing of concrete, provide sufficient heat to ensure the heating of the space involved is not less than 50 degrees Fahrenheit.
   2. For a period of ten (10) days prior to the installation of interior finishing, varnishing, painting, spackling, etc., and until final acceptance of the work or until full occupancy by Owner, provide sufficient heat to maintain a temperature of not less than 68 degrees Fahrenheit.

K. Temporary Ventilation: Provide adequate forced ventilation of enclosed areas for cutting of installed materials, to disperse humidity, and to prevent hazardous accumulation of dust, fumes, vapors, or gases.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

A. The term “utility lines” shall be understood to include, but shall not be limited to, water lines, gas lines, sanitary sewers, electric power lines, communication lines, and appurtenances such as manholes, catch basins, fire hydrants, valves, junction boxes, and switches.

B. Subject to availability and Owner’s consent, the Contractor will be allowed to use existing utilities, including water, power, and temporary heat if tied into a central system, subject to the following restrictions:
   1. The Owner will have the right to direct tap points and identify panels and other services that the Contractor may use.
   2. The Contractor shall be responsible for installation, maintenance, and removal of temporary services.
   3. The Owner will have the right to restrict use in time of emergency or for repeated abuse by the Contractor.

C. Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials, and equipment; comply with the company’s recommendations.
   1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.

D. Telephone service (cell) shall be maintained from start to completion of work. The cost of the telephone service shall be paid by the Contractor.

3.03 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities in area indicated on site plan or as instructed by Owner during preconstruction meeting.
   1. The Contractor shall coordinate a construction staging area, use qualified tradesmen to install temporary facilities, and control as required to provide orderly use. The Contractor and their employees should under NO circumstances park in Faculty or Staff Parking areas.

2. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

B. Field Offices will not be required at job site but are allowed in designated areas only. However, the Contractor is still responsible for maintaining a check-in point for all employees, Owner, Owner's Consultant, Architect, and other job site visitors. The Contractor is also responsible for maintaining a proper use and storage area for Construction Documents, Specifications, Shop Drawings, and field records. The Owner will provide the use of existing areas, when requested, for small progress meetings including tables and chairs for reviewing drawings.

C. Sanitary facilities including toilets, wash facilities, and drinking water fixtures will be provided by the Contractor and installed in designated areas only.

D. Provide watertight and secure storage sheds as necessary to hold materials to be protected while stored on site. Location of all sheds shall be approved by the Owner.

E. Install temporary paving if needed to gain access to work areas and to minimize damage or deterioration to permanent roads, paved areas, and landscape/sodded areas.

F. Provide temporary, weathertight enclosures to protect construction in progress and completed from exposure, foul weather, other construction operations, and similar activities.

G. Contractor shall erect and maintain a project sign on the job site exhibiting the name of the project, name of the Contractor, and name of the Architect. Exact size, construction, location(s), layout, colors, etc. shall be as indicated and detailed on the applicable drawings. Do not permit installation of unauthorized signs.

H. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80 °F (27 °C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

I. Night covers and/or temporary covers for unfinished work are the responsibility of the Contractor. Unfinished work shall be covered to protect the area from, but not limited to rain, wind, high or low temperatures, trip hazards, and vandalism. If an area being repaired is halted for an unforeseen condition or RFI, the Contractor shall be prepared to cover and protect the area until the Architect can visit the site and make recommendations to the Owner. If a change order is needed, it could take several days to gain approval.

J. Temporary Ceilings: Install in spaces where needed to prevent falling debris during reroofing projects from damaging or compromising critical spaces similar but not limited to, spaces open to structure, food prep and service, spaces under FDA regulations, electronics, computer, and equipment rooms. Ceiling shall be hung from the joists and fully sealed around all penetrations to protect the interior of the facility. Material shall be Classified to UL 723S for installation below sprinkler systems and meets NFPA 13.

3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Architect.

B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

C. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.
1. TEMPORARY SOIL EROSION: Control soil erosion during construction as required by the Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control.
2. STORMWATER BUREAU LETTER OF INTENT: Contractor must adhere to any requirements from the Owner or TDEC regarding erosion control.
3. CONSTRUCTION STORM WATER GENERAL PERMIT: Contractor must adhere to all conditions of the TDEC Storm Water Prevention Plan, including inspections and submittals of inspection reports.

E. Maintenance of Traffic and Circulation: Maintain circulation of traffic, both pedestrian and vehicular, and access to all parts of the site by fire-fighting apparatuses during construction.

F. Control of Dust and Mud:
1. Control construction vehicle traffic by establishing only one entry/exit point on and off Owner's Property.
2. Use watering trucks to apply water on exposed dirt which can become airborne dust. Use as often as deemed necessary and required by the Owner, Contractors, and subcontractors to control dust on the site.
3. Contractor, subcontractors, and ALL other workers for this project MUST Clean-wash ALL Construction Vehicles and ALL other Contractor's Vehicles and Equipment OFF SITE and NOT ON Owner'S PROPERTY. Contractor and subcontractors MUST submit to the Owner the Contractor's, and subcontractor's plan(s) showing use of a filtering device at each storm drain inlet on Owner's Property, and adjacent streets to prevent clogging the storm sewer pipes with mud, debris, excess cleaning solutions, products, etc. If the adjacent road(s) becomes muddy, the Contractor and subcontractors must wash down the road(s) to the satisfaction of the Owner. This cleaning shall extend as far as necessary to remove all mud and dirt generated by this project as well as protection of inlets of same roads. Use water trucks and sweeping trucks as necessary to provide water for washing roads.

G. Vermin Control: During construction, the Contractor shall keep the building and the area of the construction free from food scraps and similar organic matter which would attract vermin. He shall take measures necessary to prevent infestation of the building.

3.05 OPERATION, TERMINATION, AND REMOVAL

A. Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

B. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

1. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired. Finish grade and sod any areas where temporary items had been located.
   1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

END OF SECTION 01 50 00

SECTION 01 60 00
PRODUCTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

1.02 RELATED REQUIREMENTS

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

B. Section 01 33 00 - Submittals.

1.03 REQUIREMENTS INCLUDED

A. Conform to applicable specifications and standards.

B. Comply with size, make, type, and quality specified, or as specifically accepted in writing by Architect.

C. Manufactured and Fabricated Products:
   1. Design, fabricate, and assemble in accordance with the best engineering and shop practices.
   2. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
   3. Two (2) or more items of the same kind shall be by the same manufacturer and identical.
   4. Products shall be suitable for service conditions.
   5. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically accepted in writing by the Architect.

D. Do not use material or equipment for any purpose other than that for which it is designed or specified.

1.04 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," “accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

B. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms “material," "equipment," "system," and terms of similar intent.

C. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer’s published product literature that is current as of the date of the Contract Documents.

D. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the Work.

E. "Equipment”, is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

F. Proof of Compliance: Where the Specifications require accordance with Federal Specification, ASTM designation, ANSI Specification, or other association standard, the Contractor shall present an affidavit from the manufacturer certifying that the product complies therewith. Where requested or specified submit supporting test data to substantiate compliance.

1.05 MANUFACTURER'S INSTRUCTIONS

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in

installation, including copies to Architect, Owner, Owner's Consultant, and Contractor. Maintain one (1) set of complete instructions at the job site during installation and until completion.

B. Handle, install, connect, clean, condition, and adjust products in strict accordance with such instructions and in conformance with specified requirements.

C. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions. Do not proceed with work without clear instructions.

D. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents or Architect's written instructions.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedure and submittal schedule requirements.

1.07 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

B. Wherever in the Specifications or on the Drawings a material or article is specified or shown by using the name of a proprietary product or a manufacturer or vendor, the item named is intended to set standard of design, substance, performance, and quality of such material or article.

C. Contractor may propose equal substitutions for all products called for in any Section of this Specification, whether or not the Section so states. He is encouraged to do so when a substitution would result in a savings to the Owner with no sacrifice of quality or design intent. Substitution requests shall follow the procedure identified in Substitutions and Product Options of this section.

D. Compatibility of Options: When the Contractor is given the option of selecting between two (2) or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.08 SUBSTITUTIONS AND PRODUCT OPTIONS

A. Submit to the Architect a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor.

B. Contractor’s Options
   1. For Products specified only by reference standard, select any product meeting that standard.
   2. For Products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the Specifications.
   3. For Products specified by naming one (1) or more Products or manufacturers, Contractor must submit a request for substitutions for any Product or manufacturer not specifically named.
   4. For products specified by naming only one (1) product or manufacturer, there is no option.

C. Substitutions
   1. For a period of fifteen (15) days after Contract Date, the Architect will consider written requests for substitution of Products.
   2. Submit a separate request for each Product, supported with complete product data, with Drawings and samples as appropriate, in accordance with Section 01 33 00 - Submittals. Contractor shall submit all substitutions with a fully completed CSI Substitution Request Form.

D. By making requests for substitutions, Contractor:
   1. Represents that he has personally investigated the proposed substitute product and determined it is equal or superior in all respects to that specified;

2. Represents that he will provide the same warranty for the substitute that he would for that specified;
3. Certifies that the cost data presented is complete and includes all related costs, and excludes the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently becomes apparent; and
4. Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

E. The Architect will promptly reply in writing to the Contractor stating whether the Architect, after due investigation, has reasonable objection to any such proposal. If adequate data on any proposed manufacturer or installer is not available, the Architect may state that action will be deferred until the Contractor provides further data. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents. All products furnished by the listed manufacturer must conform to such requirements.

F. When a material, equipment, or system is accepted by the Architect for substitution, such material, equipment, or system shall become an essential element of the Contract. The Architect will be the final judge of the acceptability of the substitution. The Architect is under no obligation to consider accepting any proposed substitution, and he may reject any requested substitution for any cause or no cause. No substitution shall be made without authority in writing from the Architect.

1.09 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft. Do not use damaged materials in the Work.

B. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

C. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

D. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

E. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected from damage, deterioration, or theft.

F. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.

G. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

H. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

I. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

J. Materials, products, and equipment shall be properly containerized, packaged, boxed, and protected to prevent damage during transportation and handling.

K. Exterior Storage
1. Store fabricated products above ground, on blocking or skids to prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings. Provide adequate ventilation to avoid condensation.
2. Store loose, granular materials in well-drained area on solid surfaces to prevent mixing with foreign matter.

3. Provide substantial coverings as required to protect installed Products from damage from traffic and subsequent construction operations. Remove when no longer needed.
4. Available storage space at the job site is limited to the site. Acquisition of any additional off-site space required is the responsibility of the Contractor.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents that are undamaged and, unless otherwise indicated, unused at the time of installation.
   1. Provide products complete with all accessories, trim, finish, safety guards, and other devices and details needed for complete installations and for the intended use and effect.
   2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
   1. Proprietary Specification Requirements: Where only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.
      a. Where products or manufacturers are specified by name, accompanied by the term "or equal" or "or approved equal," comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

C. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
   1. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

D. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.

E. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Engineer/Architect will select the color, pattern, and texture from the product line selected.

2.02 NO-ASBESTOS/NO LEAD REQUIREMENTS

A. No asbestos-containing or lead-containing materials or products shall be incorporated into the project. All products and materials shall be 100% asbestos-free and 100% lead-free.

B. The intent of the Contract Documents is to exclude all materials and products which contain asbestos or lead in any form or amount. In studying the Contract Documents and at any time during execution of the Work, the Contractor shall at once report to the Architect any asbestos-containing materials or products that he may discover. Do not proceed with installation of asbestos-containing materials or products or lead-containing materials or products.

C. Where products are specified by reference standard or in a descriptive manner without manufacturer’s name, model number, or trade name, Contractor shall select materials or products meeting specified requirements which do not contain asbestos or lead in any form or amount.

D. In making requests for substitutions, Contractor shall be responsible for determining that materials and products requested for substitution are 100% free of asbestos and lead in any form.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01 60 00

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SECTION 01 73 20
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Demolition and removal of selected portions of building or structure.

B. Demolition and removal of selected site elements.

C. Salvage of existing items to be reused or recycled.

1.02 RELATED REQUIREMENTS

A. Section 01 74 19 - Construction Waste Management and Disposal for disposal of demolished materials.

B. Section 02 40 00 - Existing Conditions and Demolition.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.04 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: Detach items from existing construction and deliver them to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.

C. Pre-demolition Digital Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

D. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.06 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

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

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Standards: Comply with ANSI A10.6 and NFPA 241.

1.07 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Owner of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner. Owner will remove hazardous materials under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. 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.

1.08 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

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. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction digital photographs. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

G. Engage a professional engineer to review existing parapets once existing roofing system is removed. Engineer to approve existing paraments meet current seismic requirements per code.

3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

B. Service/System Requirements: 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 before proceeding with selective demolition, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
   3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

4. Coordinate utility shutoff with school administration and district to ensure there is neither interruption to students or faculty, nor damage to existing products or materials in the school such as food or laboratory materials.

3.03 PREPARATION

A. Site Access: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.04 SELECTIVE DEMOLITION

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. 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.
   2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. 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.
   4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   5. Dispose of demolished items and materials promptly.

B. Reuse of Building Elements: Do not demolish building elements beyond what is indicated on Drawings without Owner or Architect's consent.

C. 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 as designated by Owner.
   5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
   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.

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

3.05 DISPOSAL OF DEMOLISHED MATERIALS

A. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

B. 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.

C. Burning: Do not burn demolished materials.

D. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.06 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 01 73 20

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for cutting and patching.

1.02 RELATED REQUIREMENTS

A. See individual Specification Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.03 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
   1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
   2. Indicate dates when cutting and patching is to be performed.
   3. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

1.04 QUALITY ASSURANCE

A. Structural Elements: Prior to project commencement, the Contractor shall provide designed, stamped drawings and calculations by a licensed, professional engineer, competent in structural design. Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
   1. Obtain approval before cutting and patching the following structural elements:
      a. Bearing and retaining walls.
      b. Structural steel.
      c. Roof Decks.
      d. Parapet walls.

B. Operational Elements: Do not cut and patch operating elements or safety-related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
   1. Obtain approval before cutting and patching the following operating elements or safety-related systems:
      a. Primary operational systems and equipment.
      b. Fire protection systems.
      c. Communication systems.
      d. Electrical wiring systems.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visually unsatisfactory manner.

1.05 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Comply with requirements specified in other Sections.

B. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.01 INSPECTION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed.
   1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
   2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Temporary Support: Provide adequate temporary support of Work to be cut.

B. Protection: Fully protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.03 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: 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. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide an even plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.

3.04 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access.

B. Completely remove paint, mortar, oils, putty, and items of similar nature.

C. Thoroughly clean piping, conduit, and similar features before painting or other finishing is applied.

D. Restore damaged pipe covering to its original condition.

END OF SECTION 01 73 29

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SECTION 01 74 00
CLEANING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Execution of daily cleaning during progress of the Work and at completion of the Work.

1.02 RELATED REQUIREMENTS

A. Section 01 74 19 - Construction Waste Management and Disposal.

B. Section 01 77 00 - Closeout Procedures.

1.03 GENERAL REQUIREMENTS

A. Conduct daily cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

B. If the Contractor fails to keep the project clean, as herein specified, the Owner shall do the cleaning, the costs of which shall be charged to the Contractor.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

B. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

C. Use only cleaning methods and materials recommended by the manufacturers of the surface to be cleaned.

D. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

E. Refer to other Sections of this Project Manual for items requiring special handling and cleaning.

PART 3 - EXECUTION

3.01 PROGRESS CLEANING

A. General:
   1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
   2. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces prior to enclosing the space.
   3. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the protection required to maintain the materials in undamaged condition.
   4. Do not allow the accumulation of scrap, debris, waste material and other items not required for the construction of the Work.
   5. Twice weekly, and more often if necessary, the Contractor shall completely remove all scrap, debris, and waste material from the job site and shall place in container furnished by the Contractor.
   6. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the surrounding site.

B. Project Site:
   1. Daily, and more often if necessary, the Contractor shall inspect the project site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
   2. Weekly, and more often if necessary, the Contractor shall sweep all interior places clean. “Clean”, for the purpose of the subparagraph, shall be interpreted as meaning free from

dust and other material capable of being removed by reasonable diligence using a hand-held broom.

3. When preparing to install succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
4. Following the installation of finish floor materials, protect by covering with temporary coverings and/ or clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space if finish materials have been installed. “Clean”, for the purpose of this subparagraph, shall be interpreted as meaning free from all foreign material, which may be injurious to the finish floor material.
5. Following the installation of finish roof materials, protect the roof membrane from damage from ongoing work and resulting debris. Remove all fasteners, wood with nails, and metal components from the roof immediately. Protect walk and active work areas with slip sheets or other equivalent means of protection. Place any staged materials on roof over dunnage on slip sheets. Remove any sealants or adhesive spilled on roof deck during course of installation.

3.02 FINAL CLEANING

A. Definition: Except as otherwise specifically provided, “Clean” (for the purpose of this Section) shall be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.

B. General: Prior to completion of the Work, remove from the job all tools, temporary structures, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning prior to final project assessment.

C. Interior: Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains, and dirt from finish surfaces. Use only the specified cleaning materials and equipment.
   1. Any materials damaged as a result of the Work shall be repaired by the Contractor to the satisfaction of the Owner or replaced at no additional cost to the Owner.

D. Repair, patch, and touch up marred or damaged surfaces to match adjacent finishes.

E. Clean the following if located within the project area:
   1. Plumbing fixtures, strainers, and floor drains.
   2. Light fixtures and lamps.
   3. Replace filters of ventilating equipment when units have been operating during construction. In addition, clean grilles and louvers.
   4. Excess lubrication is to be removed from mechanical and electrical equipment.
   5. All Electrical Panels.

F. Clean all transparent materials, including glass and mirrors. Remove glazing compound and other substances that are noticeable from vision-obscuring materials.

G. Remove labels that are not permanent labels.

H. Polished and Resilient Surfaces: To all surfaces requiring the routine application of protective waxes and/or buffed polish, apply the specified coating and/or polish as recommended by the manufacturer of the material being treated, as specified in individual Specification Sections.

I. Leave concrete floors broom clean. Vacuum carpeted surfaces.

J. Clean areas traversed by construction personnel.

K. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean. Remove stains, spills, and other foreign deposits.

L. Wash walk steps, terraces, curbs, drives, and paved areas free of mud or other foreign stains.

M. Clean finish surfaces and site improvements of dirt, stains, and foreign matter.

N. Clean storm drainage systems to provide for free flow of stormwater.

O. Roof.
   1. Remove all construction debris from each roof.
   2. Verify that all roof drains, gutters, and downspouts are clear and will provide free flow of stormwater. Jet and scope existing drains 100’ minimum.
   3. Remove leaves and other foreign matter from the surface of each roof. Trim all trees and vegetation back 10’-0” from the roof edge min.

P. Maintain cleaning until the building, or portion there, is accepted by the Owner.

Q. Timing: Schedule final cleaning to enable the Owner to accept a completely clean project.

END OF SECTION 01 74 00

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SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for construction waste management and disposal.

B. Requirements for materials to be recycled, salvaged, and reused.

1.02 RELATED REQUIREMENTS

A. Section 01 33 00 - Submittals for submittal procedures.

B. Section 01 50 00 - Temporary Facilities and Controls for additional requirements related to trash/waste collection and removal of facilities and services.

C. Section 01 60 00 - Products for waste prevention requirements related to delivery, storage, and handling.

D. Section 01 77 00 - Closeout Procedures for trash and waste prevention procedures related to cutting and patching, installation, protection, and cleaning.

1.03 WASTE MANAGEMENT REQUIREMENTS

A. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

B. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

C. Owner may decide to pay for additional recycling, salvage, and/or reuse based on Landfill Alternatives Proposal specified below.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood: May be used as blocking or furring.
   5. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
   6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   7. Gypsum drywall and plaster, unless used as alternative daily cover or soil amendment.
   8. Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: Utilize reclamation programs per selected manufacturer.
   9. Acoustical ceiling tile and panels. Utilize reclamation programs per selected manufacturer.

E. Contractor shall submit monthly Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues.

F. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

G. Contractor may need to utilize more than one waste hauler to accommodate diversion rate required.

H. Contractor may need to utilize more than one collection bin or dumpster to accommodate diversion rate required.

I. Contractor shall communicate recycling availability and materials to be recycled to all subcontractors as they arrive on site.

J. Methods of trash/waste disposal that are not acceptable are:

1. Burning on the project site.
2. Burying on the project site.
3. Dumping or burying on other property, public or private.
4. Other illegal dumping or burying.
5. Incineration, either on- or off-site.

K. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

L. If the waste-sorting facility provides a waste diversion percentage specific to the project's waste based on measurement of each component, this will comply. Visual inspection is not an acceptable method of evaluation for documenting this percentage.

M. If the waste-sorting facility utilizes the facility's average diversion rate, which must be regulated by the local or state authority and must exclude ADC, this must be a closed system; shipping waste to another municipality to manage, thus burdening another system, does not count as diverting the waste. Documentation of the facility's average diversion rate must be provided.

1.04 DEFINITIONS

A. Alternative Daily Cover: Material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging.

B. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

C. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair, and demolition operations.

D. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

F. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

G. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

H. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

I. Recycling: The process of sorting, cleansing, treating, and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

J. Return: To give back reusable items or unused products to vendors for credit.

K. Reuse: To reuse a construction waste material in some manner on the project site.

L. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

M. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

N. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

O. Toxic: Poisonous to humans either immediately or after a long period of exposure.

P. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

Q. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Landfill Alternatives Proposal: Within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner, submit a projection of trash/waste that will require disposal and alternatives to landfilling, with net costs.
   1. Submit to Architect for Owner's review and approval.
   2. If Owner wishes to implement any cost alternatives, the Contract Price will be adjusted as specified elsewhere.
   3. Include an analysis of trash/waste to be generated and landfill options as specified for Waste Management Plan described below.
   4. Describe as many alternatives to landfilling as possible:
      a. List each material proposed to be salvaged, reused, or recycled.
      b. List the proposed local market for each material.
      c. State the estimated net cost resulting from each alternative, after subtracting revenue from sale of recycled or salvaged materials and landfill tipping fees saved due to diversion of materials from the landfill.

C. Once Owner has determined which of the landfill alternatives addressed in the Proposal above are acceptable, prepare and submit Waste Management Plan; submit within 10 calendar days after notification by Architect.

D. Submit Waste Management Plan within 30 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.

E. Waste Management Plan: Develop, and include the following information:
   1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
      a. Identify at least five (5) materials (both structural and nonstructural) targeted for diversion. Approximate a percentage of the overall project waste that these materials represent.
      b. Indicate if the materials will be site separated or commingled on the project site.
   2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
      a. Indicate how the recycling facility will process the materials.
   3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
      a. List each material proposed to be salvaged, reused, or recycled.
   4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
   5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
   6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

F. Waste Disposal Reports: Submit at monthly intervals, with details of quantities of trash and waste, means of disposal or reuse. Show both totals to date and since last report.
   1. Submit updated Report monthly on a form acceptable to the Owner.

2. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
3. Landfill Disposal: Include the following information:
    a. Identification of material.
    b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
    c. Include manifests, weight tickets, receipts, or tabulated reporting and invoices as evidence of quantity.
4. Recycled and Salvaged Materials: Include the following information for each:
    a. Identification of material, including those retrieved by installer for use on other projects.
    b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
    c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
    d. Include manifests, weight tickets, receipts, or tabulated reporting from the facility as evidence of quantity.
    e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
    f. If the waste-sorting facility provides a waste diversion percentage specific to the project's waste based on measurement of each component, this will comply. Visual inspection is not an acceptable method of evaluation for documenting this percentage.
    g. If the waste-sorting facility utilizes the facility's average diversion rate, which must be regulated by the local or state authority and must exclude ADC, this must be a closed system; shipping waste to another municipality to manage, thus burdening another system, does not count as diverting the waste. Documentation of the facility's average diversion rate must be provided.
5. Material Reused on Project: Include the following information for each:
    a. Identification of material and how it was used in the project.
    b. Amount, in tons or cubic yards.
    c. Include weight tickets as evidence of quantity.
6. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 – PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Contractor shall designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, Owner's Consultant, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
    1. Pre-bid meeting.
    2. Preconstruction meeting.
    3. Regular job-site meetings.
    4. Job safety meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all subcontractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 01 74 19

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SECTION 01 75 00
STARTING AND ADJUSTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Includes all material and labor to clean, inspect, and adjust in accordance with manufacturer's written recommendations for every piece of equipment, control/safety device, and system.

B. Testing, adjusting, and balancing of HVAC systems, although specified elsewhere, is part of this section.

C. Code required disinfecting of potable water systems, although specified elsewhere, is a requirement of this section.

1.02 RELATED REQUIREMENTS

A. Section 01 77 00 - Closeout Procedures.

1.03 RELATED WORK SPECIFIED/INDICATED ELSEWHERE

A. Equipment, control/safety devices, and systems, including, but not limited to, the following:
   1. Mechanical.
   2. Plumbing.
   3. Electrical.
   4. Fire Protection.
   5. Fire Alarm.

1.04 PROCEDURES

A. Mechanical and Electrical: Contractor shall provide a detailed checklist and procedures for cleaning, inspecting, and adjusting each piece of equipment, control/safety devices, system, etc. All to be in accord with the manufacturer's specific recommendations and as required to prepare each item for proper operation, including, but not limited to, the following items and systems:
   1. HVAC Systems:
      a. Exhaust (air).
      b. Make up air.
      c. Combustion air.
      d. Air handling H/C.
      e. Control.
   2. Mechanical Equipment, Control/Safety Devices.
      a. Air Handling Units.
      b. Fans and blowers.
      c. Fan coil units.
      d. Coils.
      e. Valves - gate, globe, plug, balancing, etc.
      f. Filters.
      g. Safety and pressure reducing valves.
      h. Gauges and thermometers.
      i. Thermostats and controls.
      j. Sound and vibration attenuation.
      k. Dampers and operators.
   3. Plumbing Systems.
      a. Domestic cold water.
      b. Domestic hot water.
      c. Sanitary sewer.
      d. Storm sewer.
      e. Fire Extinguishing.

4. Plumbing equipment, controls/safety devices.
    a. Water heaters.
    b. Storage tanks.
    c. Valves - gate, globe, plug, balancing, etc.
    d. Safety & pressure reducing valves.
    e. Gauges and thermometers.
    f. Thermostats and controls.
    g. Sound & vibration attenuation.
    h. Circulating pumps.
    i. House pumps.
    j. Meters (water and gas).
    k. Vacuum breakers.
    l. Backflow preventers.
    m. Fixtures and trim.
5. Electrical Systems.
    a. Emergency lighting.
    b. Grounding.
    c. Power Distribution.
    d. Lighting circuitry.
    e. Equipment - power & control.
    f. Fire alarm.
    g. Smoke detection.
    h. Light dimming.
    i. Exit lighting.
6. Electrical equipment, controls/safety devices.
    a. Motor control center.
    b. Panels - light, power, control, annunciation.
    c. Transformers.
    d. Disconnects.
    e. Breakers.
    f. Fuses.
    g. Switches.
    h. Fixtures & Lamps.
    i. Starters.
    j. Clocks/timers.
    k. Relays.
    l. Solenoids.
    m. Arrestors – surge.
    n. Thermostats.
    o. Bells/horns/buzzers/sirens.

B. Start-up and check-out of miscellaneous equipment
1. Equipment manufacturer's representative to visit site when notified by Designer that specific equipment is ready for start-up and check-out.
2. Designer, Owner, Owner's Consultant, equipment manufacturer's representative, representatives of Contractor and subcontractor responsible for hook-up, equipment design engineer, and representative of operations staff are to be present during start-up and must sign acceptance of each piece of equipment after check-out.
3. Any deficiencies found must be reported in writing to the Designer and corrected before final check-out and acceptance, again following the above procedure.
4. To minimize site visits, it is preferable to have as many pieces of equipment ready together, with the required representatives available.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Employ cleaning materials that have been recommended or produced by the manufacturer of the item or component being cleaned and have been accepted by the Designer.

B. Employ disinfecting agents that have been approved by the EPA and any other authorities having jurisdiction.

C. Employ lubricants that have been recommended or produced by the manufacturer of the item or component being lubricated and have been accepted by the Designer.

2.02 CLEANING MATERIALS

A. Cleaning materials shall be:
   1. Specifically recommended by manufacturer for the service intended.
   2. Approved by the manufacturers of the equipment, item, and system being cleaned.
   3. Approved by governing agencies.
   4. Accepted by Designer.

2.03 DISINFECTING AGENTS

A. For potable water system shall be:
   1. Specifically recommended by manufacturer for the service intended.
   2. Approved by the manufacturers of the equipment, item, and system to be disinfected.
   3. Approved by governing agencies.
   4. Accepted by Designer, Owner, and Owner's Consultant.

2.04 LUBRICANTS AND OTHER MATERIALS

A. Lubricants and other materials necessary during checking, adjusting, or servicing of each piece of equipment, control/safety device, or system in preparation for putting it into operation shall be:
   1. Specifically recommended by manufacturer for the service intended.
   2. Approved by the manufacturer of the equipment, item, or system part being checked, adjusted, or serviced.
   3. Approved by governing agencies.
   4. Accepted by Designer, Owner, and Owner's Consultant.

2.05 MATERIAL QUALITY

A. All products shall be new and of top quality. They shall be delivered to the job site in unopened clearly labeled containers giving storage and handling recommendations, expiration dates, and instructions for safe use.

PART 3 - EXECUTION

3.01 STARTING OF SYSTEMS

A. Personnel performing services pursuant to this section shall be fully trained and experienced tradesmen highly skilled in the work being performed and, where necessary or required, be factory trained and approved.

B. Contractor shall provide all required or necessary safety equipment, warning signs, barricades, etc. so that all cleaning, disinfecting, and adjusting operations will be completed without injury to personnel, equipment, property, etc.

C. All cleaning of equipment, control/safety devices, and systems shall be performed using approved top-quality trade procedures, repeated if necessary, until every piece of equipment, control/safety device, and system is clean and ready for operation as required and approved by manufacturer, governing agency, and acceptable to Designer.

D. All adjusting and servicing of equipment, control/safety devices, and systems shall be performed using top-quality trade procedures in strict accord with manufacturer's recommendations, governing agencies, and Owner's requirements.

E. The disinfecting of the potable cold and hot water systems shall be performed after the above-specified cleaning, adjusting, and servicing work has been completed and in strict accordance with governing codes and agencies, manufacturer's recommendations, and Owner's requirements. Contractor shall provide an approved laboratory's test showing test results. Disinfecting and laboratory report shall show findings acceptable to governing agencies and Designer.

F. Testing, adjusting, and balancing of HVAC systems specified elsewhere shall be performed immediately after the applicable work specified above has been completed and approved.

G. Contractor shall attest in writing and demonstrate to Designer that every piece of equipment, control/safety device, and system is clean, ready for operation, and approved for operation by governing agencies.

H. Contractor shall demonstrate to Designer, Owner, and Owner's Consultant by starting up and/or causing to function, that every piece of equipment, control/safety device, and system will perform its intended function safely, noiselessly, per governing codes and as required by Designer. This work shall be performed by highly skilled tradesmen under direct supervision of manufacturer's factory-trained and approved representatives under close surveillance of Contractor's and Owner's consultants.

END OF SECTION 01 75 00

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Inspection procedures.
   2. Warranties.
   3. Final cleaning.

1.02 RELATED REQUIREMENTS

A. See other Division 01 Specifications and Agreement Between Owner and Contractor for requirements for Applications for Payment for Substantial and Final Completion.

B. See individual Sections for specific closeout and special cleaning requirements for the Work in those Sections.

C. Section 01 20 00 - Applications for Payment for requirements for Applications for Payment for Substantial and Final Completion.

D. Section 01 74 00 - Cleaning for requirements for final cleaning.

1.03 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following and list items below that are incomplete in request.
   1. 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.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
   6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner’s personnel of changeover in security provisions.
   7. Complete startup testing of systems.
   8. Submit test/adjust/balance records.
   9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   10. Advise Owner of changeover in heating/cooling and other utilities.
   11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
   12. Complete final cleaning requirements, including touchup painting.
   13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
   14. Testing and balancing report.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will approve the Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Owner, that must be completed or corrected before approval will be given.
   1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for Final Completion.

1.04 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit a final Application for Payment according to Section 01 20 00 - Applications for Payment.
   2. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
   3. Completion shall be subject to a final inspection by the Owner's Consultant.
   4. Copies or proof of final inspection approvals by the authorities having jurisdiction shall be delivered to the Owner's Consultant.
   5. The Contractor shall provide a written guarantee that all products, materials, and workmanship will be free from inherent defects for a period of one year from the date of acceptance by the Owner. This written guarantee shall be made on the Contractor’s letterhead. Defects arising during this period shall be promptly corrected by the Contractor, at his own expense, upon notice from the Owner. This guarantee shall include all materials and labor. The Contractor shall describe the project as titled in these documents, including the contract's purchase order number and stating the specific warranty date(s) in the body of this guarantee statement.
   6. The Contractor shall supply a written statement, on company letterhead, to the Owner, stating that no asbestos-containing building materials were used in this work. The Contractor shall describe the project as titled in these documents, including the Contract's purchase order number in the body of this statement.
   7. All items on the Owner’s punch list shall be addressed and completed.
   8. NOTE: Final payment will not be approved until all of the above requirements are completed.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.05 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Contractor’s Punch List shall be submitted to Owner on the Contractor’s letterhead.
   1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.06 WARRANTIES

A. Submittal Time: Submit written warranties to Owner for designated portions of the Work where commencement of warranties other than Date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
   1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
   2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or

installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title “WARRANTIES," Project name, and name of Contractor.

C. Provide Owner with three copies of each warranty and a digital copy of each warranty, including Operation and Maintenance manuals.

PART 2 - PRODUCTS

2.01 MATERIALS

A. 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.

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. See Section 01 74 00 - Cleaning for additional requirements.

B. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

C. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for approval of Substantial Completion for entire Project or for a portion of Project:
    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development, areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Remove tools, construction equipment, machinery, and surplus material from Project site.
    d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    f. Sweep concrete floors broom clean in unoccupied spaces.
    g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
    h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
    i. Remove labels that are not permanent.
    j. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    k. Do not paint over “UL” and similar labels, including mechanical and electrical nameplates.
    l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
p. Leave Project clean and ready for occupancy.

END OF SECTION 01 77 00

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for operation and maintenance data.

1.02 RELATED REQUIREMENTS

A. See individual Sections for required service and maintenance of components represented in those Sections.

B. Section 01 77 00 - Closeout Procedures.

PART 2 - PRODUCTS

2.01 INSTRUCTION MANUALS

A. To aid the continued instruction of operating and maintenance personnel and to provide a positive source of information regarding the products incorporated into the Work, furnish and deliver the data described in this Section and in other pertinent Sections of this Project Manual.

B. Format: Confirm the Owner's format preference. Provide digital, print, or both resources as the Owner prefers.
   1. Print
      a. Size: 8-112" x 11".
      b. Paper: White bond, at least 20-pound weight.
      c. Text: Typewritten.
      d. Drawings:
         1) Bind in with the text.
         2) Fold-out drawings are acceptable.
         3) Fold drawings larger than 8-1/2" x 14" and fit into a drawing pocket inside the rear cover of the manual.
      e. Flysheets:
         1) Separate each section of the manual with a flysheet that briefly describes the contents of the section.
         2) Flysheets may be in color.
      f. Binding:
         1) Provide heavy plastic or fiberboard covers with binding mechanisms concealed.
         2) Three (3) ring binders are acceptable.
   2. Digital
      a. Combine all items onto two identical thumb drives.
      b. Information divided into individual folders for each specification section.
      c. Create folders in each specification folder to organize the materials and make items easy to find for the Owner (eg., create folders for operating manuals, record drawings, and product data).
      d. Label all files clearly in the file name with the date of issuance (eg. 2024.01.01 RTU 1 Product Data + Maintenance).

C. Measurements:
   1. Indicate all measurements in standard US units such as feet and inches, pounds, and cubic feet per minute, etc.
   2. Where items may be expected to be measured within ten (10) years in accordance with the metric formulae, provide additional measurements in the International.

D. Contents:
   1. Typewritten index.

2. Complete instructions regarding operation and maintenance of all materials involved, including:
    a. Removal and re-installation of existing adjacent materials that are in good and/or acceptable condition as deemed good and/or acceptable by Architect, Owner, and Owner's Consultant.
    b. Removal of existing adjacent materials and replacement of new adjacent materials which match removed adjacent materials as deemed acceptable by Architect, Owner, and Owner's Consultant.
    c. Normal operating procedures or sequences and any special procedures required during seasonal changes.
    d. Complete explanation of all materials specifications, applications, warranties, etc.
    e. Normal maintenance cleaning and repair procedures requirements.
    f. Predicted service life of all materials subject to wear by normal seasonal conditions.
    g. Recommendation regarding use of graffiti removal chemicals, as well as what not to use regarding graffiti removal chemicals.
3. Complete nomenclature for all materials and equipment.
4. Manufacturer's bulletins, cuts, and descriptive data where pertinent, clearly indicating the precise items included in this installation and deleting or otherwise clearly indicating all manufacturer's data with which this installation is not concerned.
5. Such other data as required in pertinent Sections of these specifications.
6. Warranties, bonds, or service agreements issued covering the materials which indicate:
    a. Material or product covered.
    b. Date the pertinent agreement started and the date the agreement will end.
    c. Owner maintenance required to maintain warranty, bond, or service repair agreement.
    d. Instances which will void or otherwise affect the warranty, bond, or service repair agreement.

PART 3 - EXECUTION

3.01 MAINTENANCE

A. Provide service and maintenance of components indicated in Specification Sections.

B. Maintenance Period: As indicated in individual Specification Sections or, if not indicated, not less than one (1) year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without the prior written consent of the Owner.

3.02 INSTRUCTION MANUALS

A. Preliminary
    1. Prepare a preliminary draft of each proposed Manual.
    2. Show general arrangement, nature of contents in each portion, probable number of drawings showing the areas of work performed per the Scope of Work and their size, and proposed method of binding and covering. If submitting digitally, confirm file organization and naming conventions conform with the Owner’s standards.
    3. Submit to the Architect for review prior to proceeding.

B. Final
    1. Comply with the pertinent provisions of Section 01 77 00 - Closeout Procedures.

2. Complete the manuals in strict accordance with the Architect's comments and information.
3. If paper copies are preferred by the Owner, provide three (3) copies.

C. Revisions
1. Following the indoctrination and instruction of operation and maintenance personnel, review all proposed revisions of the Project Manual with the Architect.
2. If the Contractor is required by the Architect to make substantial revisions to the previously approved Project Manual, additional compensation will be considered in accordance with the General Conditions of the Contract for Construction.

3.03 OWNER INSTRUCTION

A. After approval of the Maintenance Manuals but prior to Final Payment, provide a trained and experienced representative of the company contracted to provide cleaning services or work in the proper operation and maintenance of cleaning and/or repairing in-place or installed work, to identify and confirm on-site and per as-built drawings completion of all work by contract.

B. Provide the representative for not less than two (2) full workdays for proper instruction. Provide additional workdays as required based on the project scope and Owner's schedule.

C. If required due to the complexity of operation or maintenance or by stipulations of warranty, provide a representative for each pertinent manufacturer to assist in the instruction, answer questions, and to explain how maintenance can affect or void the warranty.

D. Provide a list of all company personnel dedicated to the contracted work for the duration of the work through the completion of the work with same personnel telephone numbers, cell phone numbers, respective fax numbers (if applicable), and any other information necessary to contact same personnel during and after completion (as deemed completed by the Architect) of contracted work.

END OF SECTION 01 78 23

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SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for generating, maintaining, and submitting Project Record Documents.

1.02 RELATED REQUIREMENTS

A. See General Conditions, Supplementary Conditions, and other Division 01 Sections of these Specifications for information pertaining to the Work of this Section.

B. Section 01 20 00 - Applications for Payment.

C. Section 01 33 00 - Submittals.

D. Section 01 77 00 - Closeout Procedures.

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01 33 00 - Submittals.

B. Pay Applications: Each pay application shall include a statement signed by both the Contractor and the Architect that the "Job Set" is current with any changes such as location, material, manufacturer, etc. This covers both the Drawings and the Specifications.

C. Prior to submitting request for final payment, submit the Final Project Record Documents to the Architect for review.

1.04 QUALITY ASSURANCE

A. Throughout progress of the Work, maintain an accurate record of changes in the Job Set, and, upon completion of the Work, transfer the recorded changes to the Final Project Record Documents, per Part 3 of this Section.

B. Delegate the responsibility for maintenance of Job Set to one person on the Contractor’s staff as required by the Architect.

C. Accuracy of Records
   1. Thoroughly coordinate changes within the Job Set, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
   2. Accuracy of records shall be such that future searches for items shown in the Contract Documents may rely reasonably on information obtained from the approved Final Project Record Documents.
   3. Entries shall be made within 24 hours after receipt of information that the change has occurred.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Maintain the Job Set completely to protect against deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the Final Project Record Documents.

B. In the event of loss of recorded data, use means necessary to again secure the data to the Architect’s requirement.
   1. Such means shall include, if necessary, in the opinion of the Architect, removal and replacement of concealing materials.
   2. In such cases, provide replacements to the standards originally required by the Contract Documents at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 RECORD DOCUMENTS – AS-BUILT DRAWINGS AND PROJECT MANUAL

A. Job Set: Promptly following receipt of the Owner's Notice to Proceed, secure one complete set of all Documents comprising the Contract. Place in Field Office.

B. Final Project Record Documents: At a time nearing the completion of the Work, prepare and provide all drawings and specifications according to the Owner's preference: digital, print, or both.
   1. Format.
      a. Print
         1) Size: 8-112" x 11"
         2) Paper: White bond, at least 20-pound weight
         3) Text: Typewritten
         4) Drawings:
            (a) Bind in with the text.
            (b) Fold-out drawings are acceptable.
            (c) Fold drawings larger than 8-1/2" x 14" and fit into a drawing pocket inside the rear cover of the manual.
         5) Flysheets:
            (a) Separate each section of the manual with a flysheet that briefly describes the contents of the section.
            (b) Flysheets may be in color.
         6) Binding:
            (a) Provide heavy plastic or fiberboard covers with binding mechanisms concealed. Three (3) ring binders are acceptable.
      b. Digital
         1) Combine all items onto two identical thumb drives.
         2) Information divided into individual folders for each specification section.
         3) Create folders in each specification folder to organize the materials and make items easy to find for the Owner (eg., create folders for operating manuals, record drawings, and product data).
         4) Label all files clearly in the file name with the date of issuance (eg. 2024.01.01 RTU 1 Product Data + Maintenance).

C. PREPARE AND PROVIDE ONE ELECTRONIC DWG CAD FILES ON CD of all drawings and specifications. The electronic copy shall be as follows:
   1. Electronic copy of project "specifications" in Microsoft Word 2010.
   2. One hard-copy set of "Construction" and "As-Built" drawings with "Final" Architect/ Engineer Seals.
   3. Hard copies of all "field" changes made by individual trades, especially Electrical, Plumbing, and Mechanical.
   4. Electronic copies of "Construction" and "As-Built" drawings on CDs shall include the following in AutoCAD Release 2013 or greater and Revit 2023 or greater when Revit is used as the documentation software:
      a. All xrefs; Do not bind xrefs.
      b. All plot files. May bind.
      c. No junk files.
      d. Each "Division" shall be in separate folders, i.e., Architectural, Civil, etc.
      e. Each Division folder and Sheet shall be named accordingly, i.e. "A3.01", including "Drawing Dates".
      f. All tifs and pdfs to have appropriate professional "Seal".
      g. Label each thumb drive with: Location Name, Project Name, Date, and number of drive, i.e., 1 of 3, etc.

h. All xrefs shall be loaded and attached to each drawing so that each drawing is viewable when opened.
i. As-Built Drawings with Auto CAD DWG. Scanned or non-vector PDF's or other file formats will not be accepted.
j. As-Built Drawings shall be submitted with a cover list of each specific change: sequential numbering of each change, corresponding drawing sheet number where change occurred, etc. and including all As-Built Section requirements within this Project Manual.

PART 3 - EXECUTION

3.01 MAINTENANCE OF JOB SET

A. Immediately upon receipt of the Job Set described in Part 2, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET".

B. Preservation
1. Considering the Contract completion time, the probable number of occasions upon which the Job Set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the Job Set to the Architect's requirement. .
2. Do not use the Job Set for any purpose except entry of new data and for review by the Architect, until start of transfer of data to Final Project Record Documents.
3. Maintain the Job Set at the Site Office.

C. Making Entries on Job Set
1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required. This is for drawings and specifications.
2. Date all entries.
3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
4. In the event of overlapping changes, use different colors for the overlapping changes.
5. Make entries in other pertinent Documents as required by the Architect.
6. Mark up new information which is recognized to be of importance to the Owner but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date.
7. Note related change order numbers where applicable.
8. Markings shall be legible.

D. Conversion of schematic layouts
1. In some cases, on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, are shown schematically and are not intended to portray precise physical layout.
2. Final physical arrangement is determined by the Contractor, subject to the Architect's acceptance.
3. Design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.

E. Show on the Job Set, by dimension accurate to within one half inch.
1. Clearly identify the item by accurate note such as "cast iron drain", or "roof hatch", etc.
2. Show, by symbol or note, the vertical location of the item such as "under slab", "in ceiling plenum", "exposed", etc.
3. Make all identification so descriptive that it may be related reliably to the Specifications.

F. Give particular attention to substitutions, selection of options, and similar information on work where it is concealed or otherwise cannot be discerned readily at a later date by direct observation. Note related record drawing information and product, where applicable.

3.02 FINAL PROJECT RECORD DOCUMENTS

A. The purpose of the Final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.

B. Preparation to transfer recorded data
   1. Following receipt of the electronic copy of the Contract Drawings and Specifications and prior to start of transfer of recorded data thereto, secure the Architect's acceptance of all recorded data.
   2. Make required revisions.

C. Transfer of data to Drawings
   1. Clearly indicate at each affected detail and other Drawings a full description of changes made during construction and the actual location of items.
   2. Call attention to each entry by drawing a "cloud" around the area or areas affected.
   3. Make changes neatly and consistently to ensure clear plotting.

D. Transfer of data to Specifications.
   1. Make changes in MICROSOFT WORD 2010 to all sections. Show changes in bold followed by the letters "FPRD" in parenthesis (for Final Project Record Documents).
   2. In the Table of Contents, put the same letters (in bold) beside any section so changed.

E. Review and submittal
   1. Submit the completed set of Final Project Record Documents to the Architect.
   2. Participate in review meetings as required.
   3. Make required changes and promptly deliver the Final Project Record Documents to the Architect.

3.03 CHANGES SUBSEQUENT TO ACCEPTANCE

A. The Contractor has no responsibility for recording changes in the Work after Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION 01 78 39

SECTION 02 40 00
EXISTING CONDITIONS AND DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Materials and procedures needed during demolition of non-asbestos containing materials and parts of existing buildings and site conditions.

1.02 RELATED REQUIREMENTS

A. Section 01 50 00 - Temporary Facilities and Controls for site fences, security, and protective barriers.

B. Section 01 74 19 - Construction Waste Management and Disposal for waste disposal and removal requirements.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Site Plan: Indicate:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.

C. Demolition Plan: Submit demolition plan as required by OSHA and local AHJs.
   1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.
   2. Summary of safety procedures.
   3. Demolition firm qualifications.

D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

A. Coordinate demolition and cutting times to cause minimum disruption to Owner's continuing operations within the building. Schedule any Mechanical and Electrical shutdown at least seven (7) days in advance. Notify Owner at least 72 hours in advance of the start of any work which will produce excessive noise, vibration, dust, power outage, HVAC shutdown, plumbing shutdown, etc.

B. Conform to all local, state, and national codes and ordinances including OSHA and EPA. Secure necessary permits and approvals. Post signs and erect barricades to fully protect all persons on and around the project. Where hazardous substances are encountered or suspected, refer to OSHA and EPA regulations for proper procedures.

C. Maintain all active mechanical, communication, and electrical services which pass through or across project area. Restore all services which are cut off by demolition. Should a question exist regarding the function of any lines, request direction prior to demolition. Upon completion of project, all services throughout the building shall be operational.

D. Remove trash from building by way of a temporary chute to control dust and blowing trash. Dump trash directly into truck bed or commercial-type waste removal container. Provide cover over truck bed or around waste container opening to control dust. Dispose of trash in

accordance with local ordinances. Do not allow excessive trash to accumulate on the building and site or in such a way as to overload the structural system.

E. Provide ground protection for all dumpsters, job trailers, storage containers, and construction materials. Construct in a manner to protect all sodded areas, plazas, and walkways. These items shall not be allowed near Landscaped and irrigated areas. The Contractor shall repair any damage to these areas which may result from the installation or removal of these temporary items.

F. Erect covered walkways, barrier fences, guard rails, and shoring to protect pedestrians, personnel, occupants, structures, and utilities that are to remain intact and in operation on a day-to-day basis during demolition and construction operations.

G. Construct dust curtains, covers, and walls to contain contaminants generated from demolition operations. Construct in a manner to protect all existing equipment and permit full use and occupancy of unaltered spaces and areas.

H. Erect temporary canopies and covers over unfinished work areas to prevent rain, wind, and weather damage to building interiors or uncompleted site work. Contractor shall repair all damage to building or site that may result from the areas not being properly covered or protected. Contractor shall be mindful that the cover may need to stay in place for several days.

I. Contractor shall only tear off roofing and materials that can be replaced during the daily working hours. Contractor is responsible for checking all weather reports and conditions. In the event that unforeseen conditions arise with the construction or weather conditions, the Contractor shall have on-site materials to erect temporary canopies, covers, and roofs to prevent water or rain damage to the building interiors. The Contractor shall repair any damage which may result from their temporary covering not being watertight.

J. Ensure minimum interference with roads, streets, driveways, sidewalks, and adjacent facilities. Do not close or obstruct streets, walks, or other facilities without written permission from authorities having jurisdiction.

K. At completion of project repair all damage to site and site improvements. Repair damage to curbs, walks, asphalt and concrete parking and drives, landscaping, irrigation lines, sprinkler heads, existing structures, outdoor furniture, and vehicles. Sod all bare earth.

L. Coordinate all demolition with requirements specified in structural, plumbing, mechanical, and electrical Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide Barricades and Signage in accordance with Temporary Facilities and Controls Section 01 50 00 - Temporary Facilities and Controls.

B. Provide construction chutes, as needed, from sturdy materials. They should be properly braced and extend from the dumping point to slightly above truck or container rail, to control dust and trash during removal from the site.

C. Provide adequate dust screens to protect existing spaces utilizing heavy plastic sheeting and wood framing. Tape joints and edges to make dust tight.

D. Where existing materials to remain are damaged during demolition, repair damage utilizing materials equal to original material in new condition.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Obtain required permits.

B. Comply with applicable requirements of NFPA 241.

C. Use of explosives is not permitted.

D. Survey existing conditions and correlate with drawings and specifications to determine extent of demolition required.

E. In so far as is practical, arrange operations to reveal unknown or concealed conditions for examination and verification before removal or demolition.
   1. Hazardous Materials:
      a. If hazardous materials are discovered during removal operations, stop work and notify Architect, Owner, and Owner's Consultant; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.
      b. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.

F. Verify actual conditions to determine in advance whether removal or demolition of any element will result in failure or unplanned collapse.

G. Perform continuing surveys as the work progresses to detect hazards resulting from demolition or construction activities.

H. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.

I. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.

J. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

K. Contractor shall ensure proposed demolition does not impact structural systems or foundations to remain. Do not over-excavate adjacent to existing footings and foundations. Notify Owner, Architect, and Engineer if structural elements are discovered during the course of demolition that are not shown on plans.

3.02 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least seven (7) days prior written notification to Owner.

E. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

F. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

G. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

3.03 INSTALLATION

A. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

B. Demolish and dispose of all materials and equipment as indicated on the drawings.

C. Use proper trades for decommissioning existing services. Do not remove active services which pass through or over the project area. Reroute these services where necessary, utilizing appropriate materials.

D. Patch around openings to match existing. Where demolition exposes holes in walls, floors, ceilings, roofs, etc., that are to remain, close opening with material to match existing. Provide

structural members, reinforcing, etc. necessary to close the opening and maintain structural integrity as required by the Architect or Engineer.

E. Where services and equipment must pass through roofs, walls, or other floors, do minimum demolition. When cutting structural slabs, make holes minimum in size. Take extreme care to avoid fires when utilizing cutting torches. Re-grout and seal all holes after services and equipment are installed.

F. All salvageable materials become the property of the Contractor, unless otherwise indicated. Where existing materials are indicated to be salvaged for reuse, use extreme care in their removal and storage. Carefully cull and clean materials prior to reuse.

3.04 CLEANUP

A. Upon completion of the demolition work, all removed materials shall be either relocated to their proper storage facility, sent to proper salvage yards, or placed in proper trash containers, leaving the project area neat, clean, straight, and ready for the install of new construction.

B. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 40 00

SECTION 04 01 20
UNIT MASONRY RESTORATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cutting and Chipping.

B. Repairing of Cracks.

C. Restoration Work.

D. Removal of Paint.

E. Cleaning.

1.02 RELATED REQUIREMENTS

A. Coordinate the Work of this Section with the Work of other Sections specifying remedial work, corrective measures, and restoration work.

B. 01 74 00 - Cleaning.

C. 02 40 00 - Existing Conditions and Demolition.

D. 09 91 13 - Exterior Painting.

1.03 REFERENCE STANDARDS

A. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.

B. ASTM C928/C928M - Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs; 2020a.

C. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.

1.04 REGULATORY REQUIREMENTS

A. In addition to the foregoing referenced standards, the regulatory requirements that govern the work of this Section include the following code requirements:

1. California Code of Regulations (CCR), Title 24, Part 2, California Building Code, Chapter 34, "Existing Structures."

1.05 MEASUREMENT AND PAYMENT

A. Measurement: Repair and restoration of existing masonry will be measured for payment by the lump-sum method, acceptably performed and completed.

B. Payment: Repair and restoration of existing masonry will be paid for at the indicated Contract lump-sum price as indicated in the Bid Schedule of the Bid Form.

1.06 COORDINATION OF WORK WITH BUILDING(S) TO REMAIN IN OPERATION

A. The building(s) involved in this work will be in continuous operation during the construction period. This will require that the Contractor plan the Work carefully to work around unavoidable obstacles in the prosecution of the Work. It will require further that the Contractor complete some new construction facilities required in the renovation work before proceeding with the masonry restoration work.

B. Provide such additional temporary facilities as may be required to facilitate continuous, unobstructed building operations during transitional construction work.

1.07 QUALITY ASSURANCE

A. Repair and restoration of existing masonry surfaces shall be performed by a skilled and experienced subcontractor specializing in the restoration of masonry with at least five (5) years experience in the type of work involved.

B. Repair and restoration of existing stone and unit masonry work shall achieve security, strength, and weather protection, as applicable and required, and shall preserve the integrity and continuity of fire-rated assemblies.

C. Repair and restoration of existing masonry work shall successfully duplicate undisturbed adjacent finishes, colors, textures, and profiles. Where there is a dispute as to whether or not duplication is successful or has been achieved to a reasonable degree, the Architect's judgment shall be final.

PART 2 - PRODUCTS

2.01 MATERIALS, EQUIPMENT, AND FACILITIES

A. Requirements: Provide all materials, equipment, tools, appurtenances, facilities, and services as required for performing and completing all repair and restoration of existing stone and unit masonry as indicated.

B. Equipment, Tools, and Materials: Provide appropriate and proper equipment, tools, and materials for the chipping and air-pressure cleaning of cracks in masonry, for pressure injection grouting of cracks in mortar joints, for sandblasting or water-blasting of masonry surfaces, and for hose cleaning of masonry.

C. Stone and Unit Masonry Materials: Where cut stone or concrete masonry units are damaged and require replacement, provide new stone or masonry units that match exactly the species, color, and texture of adjacent masonry surfaces. Replacement cut stone and concrete masonry units require review by the Architect before they may be used in the work.

D. Mortar Bonding Agent: Adhesive for the bonding of new mortar and grout to existing masonry and mortar shall be an epoxy adhesive meeting requirements of ASTM C881/C881M , of type required for the conditions.

E. Mortar Repair Materials:
   1. Mortar: Mortar for joints and tuckpointing shall be an epoxy mortar, polymer-fortified mortar, or similar high-strength bonding mortar conforming with ASTM C928/C928M. Minimum compressive strength at 28 days shall be 2,500 psi.
   2. Sand: Sand shall be a clean, washed, kiln-dried, fine sand, all passing a U.S. Standard No. 16 sieve.

F. Grout: Grout for pressure-injection grouting shall be a high-strength, nonshrink, cementitious, adhesive grout conforming with ASTM C1107/C1107M, Grade C, or a high-strength, non-shrink, manufactured epoxy adhesive grout. Minimum compressive strength at 28 days shall be 4,000 psi.

G. Cleaning Agent: Mild solution of hydrochloric acid or muriatic acid, for washing of stubborn stains on masonry.

PART 3 - EXECUTION

3.01 REQUIREMENTS

A. Perform cutting, chipping, patching/restoring work, and cleaning in a manner to prevent damage to other work, and as required to return exterior building surfaces to essentially their original condition and configuration.

B. Major cracks shall be repaired and filled by pressure-injection grouting. All other cracks shall be repaired in the manner most appropriate and as required for weatherproofing or waterproofing the building or structure.

C. Add new through-wall flashing to meet the designed intent of raising the through-wall flashing for increased insulation thickness and flashing heights.

D. Do not cut or alter structural members when not indicated without prior approval of the Architect.

E. Finish or refinish as required to match adjacent finishes.

F. Should Contractor discover larger masonry repairs are required, Contractor shall notify the Owner for additional direction before proceeding.

3.02 CUTTING AND CHIPPING

A. Cutting and chipping work shall be neatly and accurately performed with proper tools and equipment. Cuts shall be of minimum size required for the work. Check the locations carefully of existing steel reinforcement before cutting or chipping.

B. Existing work to remain shall be properly protected to prevent damage from cutting and chipping operations.

3.03 REPAIRING OF CRACKS

A. Cracks shall be repaired and filled with grout by the pressure-injection process. Masonry joint cracks shall be mapped, and the injection shall be on center-to-center spacings as necessary to achieve proper structural bonding. Replace all cut stone and masonry units that have cracks across the face.

B. Adhesive material shall be mixed with grout in proportion necessary to provide structural bonding of concrete. Grout material shall be inserted into cracks by pressure-injection grouting in accordance with the manufacturer's installation instructions and recommendations.

C. Minor cracks too small for injection grouting shall be repaired as specified in Article 3.04 for restoration work.

D. Small holes, cracks, and other imperfections to be painted shall be suitably primed and patched with a compound recommended by the manufacturer of the paint to be applied to these surfaces as specified in Section 09 91 13 - Exterior Painting.

3.04 RESTORATION WORK

A. Preparation of Existing Surfaces: Where masonry is cracked or spalled, cut or chip out to solid surface. Use power wire brush and high-pressure air to clean masonry of dirt, dust, and loose particles. Clean exposed reinforcing bars with power wire brushing to remove all visible corrosion.

B. Repairing of Masonry:
   1. Repairing and patching of existing masonry surfaces and joints shall be expertly performed with specified adhesive, mortar, and grout materials. At completion, patched surfaces shall match adjacent existing surfaces as closely as possible.
   2. Mortar bonding agent, mortar, and grout shall be applied or installed where indicated, or where otherwise required, in accordance with the manufacturer's instructions and recommendations.
   3. Where necessary to build out cut, spalled, or chipped masonry surfaces, mix mortar bonding agent, mortar, and sand into a special mortar, and apply in layers as required to fill out or build up surfaces. Float, trowel, or texture surfaces to match adjacent existing surfaces.
   4. Where indicated or required to replace existing, damaged cut stone or concrete masonry units, expertly cut out damaged units with masonry saw or cutting wheel. Clean out all loose particles and dust with air-pressure cleaning. Then install new units to match adjacent existing masonry surfaces as closely as possible, including joint treatment.

C. Tuckpointing:
   1. Joints of cut stone and concrete unit masonry shall be routed out and tuckpointed as herein specified. Only such tuckpointing shall be performed as required to put all joints of the building in good repair.
   2. Faulty joints to be tuckpointed shall be routed out the full width of the existing joint with a machine masonry cutting wheel to a minimum depth of 3/8 inch into the existing mortar. Newly routed joints shall be washed clean before tuckpointing.
   3. Tuckpointing mortar shall be the repair mortar specified in Part 2 herein.

3.05 REMOVAL OF PAINT

A. Where removal of existing paint film is required for restoration of masonry surfaces, existing painted masonry surfaces shall be sandblasted by the "wet" sandblast method to remove all such paint film. Surfaces not to be sandblasted shall be properly masked and otherwise protected to preclude any damage to these surfaces.

B. Wet sandblasted surfaces shall be thoroughly dry or dried before painting work is started as specified in Section 09 91 13 - Exterior Painting.

3.06 CLEANING

A. Where existing masonry surfaces are indicated to be cleaned or washed to remove dirt, dust, and stains, such surfaces shall be washed clean to an even and uniform effect, free of stains and blemishes. Include adjacent cornices, ledges, and masonry ornaments. Method of cleaning (e.g. high-pressure water, steam cleaning, or diluted acid cleaning) are subject to approval by the Architect.

B. All adjacent glass areas shall be cleaned after washing of masonry surfaces.

C. Replace any glass damaged by the cleaning operations.

END OF SECTION 04 01 20

SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. All miscellaneous metals indicated or required to complete the work and not specified in other Sections.

B. Supplementary structural steel incorporated in the project and shown on the Drawings.

C. Miscellaneous metal items which are fully described on the drawings and not necessarily named herein but shall be provided as shown and subject to applicable requirements of this Section.

D. Miscellaneous support and clip angles, including deck and joist support and clip angles.

E. Metal frames for framed openings.

F. Handrails and railings.

G. Sleeves as required for the passage of utilities through the structure and as required.

H. Trench Covers and Grates.

I. Other items as required to complete the Work.

J. Equipment screens.

K. Prefabricated ladders and ship ladders.

1.02 RELATED REQUIREMENTS

A. Section 05 51 33 - Metal Ladders for new ladders.

B. Section 09 91 13 - Exterior Painting for painting of exposed metal fabrications.

1.03 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

E. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

F. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

H. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2023.

I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

K. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.

L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

M. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

N. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.04 QUALITY ASSURANCE

A. Materials shall be free from defects impairing strength, durability, or appearance, and of best commercial quality for purposes specified.

B. Exposed surfaces throughout the building shall have the same inherent texture and color for like location.

C. Fastenings shall, insofar as practicable, be non-corrosive, non-staining, and concealed. Fastenings that must be exposed shall be of the same material, color, and finish as material to which applied, shall be countersunk, and finish flush.

D. Exposed welds shall be ground smooth to form a neat uniform fillet without weakening base metal.

E. Molded, bent, or shaped members shall be formed with clean sharp arises, without dents, scratches, cracks, or other defects.

F. Provide all anchors, bolts, shims, and accessory items required for building into fastening to adjacent work.

1.05 SUBMITTALS

A. Copies of shop drawings and complete installation data shall be furnished to the Architect on all items specified in this Section.
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

B. Submit shop drawings in accordance with Section 01 33 00 - Submittals, prior to any fabrication.

C. Welders' Certificates: Submit certification for welders employed on project, verifying AWS qualificiation within the previous twelve (12) months.

D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.06 FIELD MEASUREMENTS

A. Take all necessary field measurements to verify or supplement dimensions shown on the drawings. Furnish templates as required or directed.

B. The Contractor shall be responsible for furnishing all necessary instructions for the setting of anchors, bearing plates, and miscellaneous items and for ensuring that all materials are properly set during the progress of work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Structural steel angles for miscellaneous bracing, reinforcement, etc., shall be provided as indicated on drawings. Steel clip angles shall conform to ASTM A36/A36M. Steel angles exposed to weather or built into exterior walls shall be hot-dipped galvanized.

B. Pipe Sleeves: All metal posts and pipes set in concrete shall be inserted into pipe sleeves. Sleeves shall be length as required by 1-1/2 inches larger than the item they are to receive and the same shape (round, square, or rectangle) as the conduit. Fabricate sleeves from 18 gauge steel; provide two hairpin anchors per sleeve. All joints and connections shall be full welded, and the entire sleeve assembly will be hot-dipped galvanized after fabrication. Steel sleeves exposed to weather and built into concrete shall be hot-dipped galvanized.

C. Primer used to touch up galvanized surfaces shall be manufacturer's standard or ZRC Cold Galvanizing Compound as manufactured by ZRC Chemical Products Company of Quincy, Massachusetts or equal.

D. Frames for Roof Openings and Supports: Fabricate all miscellaneous roof frames to sizes shown on the drawings.

E. Provide and install all other metal items, required to complete the Work, not specifically mentioned herein or specified in other divisions.

F. Rough Hardware: Furnish custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes for framing, supporting, and anchoring woodwork.

G. Ladders: Aluminum in compliance with ANSI A14.3 with mounting brackets and attachments; prime paint finish.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 FABRICATION AND INSTALLATION

A. General:
   1. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
   2. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, flathead (countersunk) screws or bolts. Fasteners for exterior work shall be stainless steel. All other fasteners shall be compatible with the material(s) being secured, anchored, etc.
   3. Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
   4. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

B. Steel Handrails and Railings:
   1. All handrails and railings shall be fabricated in the sizes and shapes shown on the drawings. Steel railings shall have all connections welded and all welds shall be ground smooth. After fabrication, all handrails and railings shall receive the specified paint finish.
   2. Anchor railings (in concrete) in sleeves with "PorRok" anchoring cement as manufactured by Hallemite of Montvale, New Jersey.
   3. Clean field welds, bolted connections, and abraded areas and apply primer compatible with shop-applied primer.

C. Sleeves: Sleeves shall be installed in proper locations prior to the placing of the concrete. Set sleeves at proper elevations, spread hairpin anchors, and tie into place. Sleeves are not to be elevated with any material foreign to that used in normal concrete placement. Prior to concrete placement pack all sleeves with paper or cloth wadding. Final installation shall leave sleeves flush with top of the concrete and in true vertical position. Wadding is to remain in the sleeves until items are set into sleeves.

3.03 PAINTING AND PROTECTIVE COATING

A. All ferrous metal, except stainless steel and galvanized surfaces, shall be properly cleaned and given one shop coat of Zinc Rich primer. Anchors that are built into masonry shall be coated with asphalt paint unless specified to be galvanized. Metal work to be encased in concrete shall be left unpainted unless specified or noted otherwise. Where hot-dip galvanized or zinc-coated metal is specified or shown, it shall not be shop-primed unless specifically required.

B. Hot-dip galvanizing or zinc coatings applied on products fabricated from rolled, pressed, and forged steel shapes, plates, bars, and strips shall comply with ASTM A123/A123M. Hot-dip galvanizing or zinc coatings on assembled steel products shall comply with ASTM A 386.

Galvanized surfaces for which a coat of paint is specified shall be chemically treated to provide a bond for the paint. Except for bolts and nuts, all galvanizing shall be done after fabrication.

3.04 TOLERANCES FOR EXPOSED WORK

A. Machine filed and shop assembled mechanical joints to fit within 1/32". Install free-standing items to 1/4" of correct position. Items enclosed or recessed in finished surfaces shall be centered in openings unless detailed otherwise. Sizes of each element of an assembly shall be correct within 1/8"; total size of an enclosed assembly shall be correct with 1/4" (clear of opening not more than 1/8" all around); total size of a free-standing assembly shall be correct within 1/2". No part of hole shall show around screws or bolts, and no extra (unused) holes shall show on faces of item.

3.05 PROTECTION

A. Protect miscellaneous metal items from damage until Date of Substantial Completion. Damaged factory prime coats on ferrous metals shall be corrected immediately. Remove all rust before repriming. Where touch-up is required, sand or steel wool prime coat to feather edge and brush out touch-up to provide a smooth finish surface ready for job painting.

3.06 CLEANING

A. Before Date of Substantial Completion, remove all protective maskings and coverings and clean exposed surfaces of foreign matter. At the completion of this work, remove from the site all excess materials and debris. Leave entire work area in a neat workmanlike condition ready for final inspection.

B. Clean field welds, bolted connections, and abraded areas and apply cold galvanizing compound to comply with ASTM A780/A780M, except that the paint shall be brushed on or spray applied in multiple coats until a dry film thickness of 8 mils minimum has been achieved.

END OF SECTION 05 50 00

SECTION 05 51 33
METAL LADDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop-fabricated metal ladders.

B. Prefabricated ladders.

C. Prefabricated ship ladders.

D. Existing ladders to remain in place.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications.

B. Section 09 91 13 - Exterior Painting for paint finish.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 22 00 - Unit Prices for additional requirements.

B. Components:
   1. Basis of Measurement: By the unit.
   2. Basis of Payment: Includes fabrication, finishing, and installation.

1.04 REFERENCE STANDARDS

A. 29 CFR 1910.23 - Ladders; Current Edition.

B. 29 CFR 1926.1053 - Ladders; Current Edition.

C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.

D. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

E. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

G. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).

H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

I. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

J. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

K. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

L. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2023a.

M. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

N. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

O. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

P. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

Q. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

R. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.

S. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.

T. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings; 2018, with Editorial Revision.

U. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

V. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2019a.

W. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

X. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2023.

Y. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

Z. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.

AA. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

BB. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).

CC. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.

DD. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

EE. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

FF. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Shop Drawings:
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

D. Designer's Qualification Statement.

E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.06 QUALITY ASSURANCE

A. Design ladders under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

F. Bolts, Nuts, and Washers: ASTM A307, plain.

G. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B211/B211M, 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.

D. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.

E. Aluminum-Alloy Sand Castings: ASTM B26/B26M.

F. Aluminum-Alloy Die Castings: ASTM B85/B85M .

G. Bolts, Nuts, and Washers: Stainless steel.

H. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.03 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by intermittent welds and plastic filler.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED LADDERS

A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
   1. Side Rails: 3/8 by 2 inches (9 by 50 mm) members spaced at 20 inches (500 mm).
   2. Rungs: One inch (25 mm) diameter solid round bar spaced 12 inches (300 mm) on center.
   3. Space rungs 7 inches (175 mm) from wall surface.

2.05 PREFABRICATED LADDERS

A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
   1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
   2. Materials: Aluminum; ASTM B211/B211M 6063 alloy, T52 temper.
   3. Finish: Mill finish aluminum.
   4. Manufacturers:
      a. Industrial Ladder & Scaffolding, Inc.: www.anyladder.com/#sle.
      b. O'Keeffe's Inc; Model 500: www.okeeffes.com/#sle.
      c. Precision Ladders, LLC; Fixed Alumnium Wall Ladder: www.precisionladders.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Prefabricated Ship Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
   1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
   2. Materials: Aluminum; ASTM B211/B211M 6063 alloy, T52 temper.
   3. Incline: 60 degrees.
   4. Finish: Mill finish aluminum.
   5. Manufacturers:
      a. O'Keeffe's Inc; Model 520: www.okeeffes.com/#sle.
      b. Precision Ladders, LLC; Alumnium Ship Stairs: www.precisionladders.com/#sle.
      c. SixAxis; ErectaStep - Ships Ladder: www.sixaxisllc.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Prefabricated Folding Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
   1. Components: Manufacturer's standard rails, rungs, treads, handrails, returns, platforms, and safety devices complying with the requirements of the MATERIALS article of this section.
   2. Materials: Aluminum; ASTM B211/B211M 6063 alloy, T52 temper.
   3. Operation: Manual.
   4. Finish: Mill finish aluminum.
   5. Manufacturers:
      a. Precision Ladders, LLC; Super Simplex: www.precisionladders.com/#sle.
      b. Precision Ladders, LLC; Automatic Super Simplex: www.precisionladders.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 FINISHES - STEEL

A. Prime paint steel items.
   1. Do not prime surfaces in direct contact with concrete.
   2. Do not prime surfaces where field welding is required.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating. (Provide minimum 530 g/sq m galvanized coating.)

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.07 FINISHES - ALUMINUM

A. Exterior Aluminum Surfaces: Class I natural anodized.

B. Interior Aluminum Surfaces: Class I natural anodized.

C. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

D. Class II Natural Anodized Finish: AAMA 611 AA-M12C22A31 Clear anodic coating not less than 0.4 mils (0.01 mm) thick.

E. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils (0.018 mm) thick; light bronze.

F. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils (0.018 mm) thick; light bronze.

G. Class II Color Anodized Finish: AAMA 611 AA-M12C22A32 Integrally colored anodic coating not less than 0.4 mils (0.01 mm) thick; light bronze.

H. Class II Color Anodized Finish: AAMA 611 AA-M12C22A34 Electrolytically deposited colored anodic coating not less than 0.4 mils (0.01 mm) thick; light bronze.

I. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish; color as indicated.

J. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system; color as indicated.

K. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system; color as indicated.

L. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.08 FABRICATION TOLERANCES

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).

C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).

D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).

E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

C. Existing ladders to remain in place and altered: Clean and strip to bare metal prior to painting.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed , except surfaces to be in contact with concrete.

G. Existing ladders to remain in place and altered: Prime and paint according to requirements of Part 2 of this Section.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

3.05 PROTECTION

A. Protect miscellaneous metal items from damage until Date of Substantial Completion. Damaged factory prime coats on ferrous metals shall be corrected immediately. Remove all rust before repriming. Where touch-up is required, sand or steel wool prime coat to feather edge and brush out touch-up to provide a smooth finish surface ready for job painting.

END OF SECTION 05 51 33

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Rough opening framing for doors, windows, and roof openings.

B. Sheathing at metal flashings and siding.

C. Roof-mounted curbs.

D. Roofing nailers.

E. Preservative treated (PT) wood materials.

F. Fire-retardant treated (FRT) wood materials.

G. Miscellaneous framing and sheathing.

H. Concealed wood blocking, nailers, and supports.

I. Plywood sheathing at roof and soffit areas indicated.

J. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications for miscellaneous steel connectors and support angles for wood framing.

B. Section 07 60 00 - Flashing and Sheet Metal for sill flashings.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2022.

C. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel; 2021.

D. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

F. AWPA U1 - Use Category System: User Specification for Treated Wood; 2023.

G. PS 1 - Structural Plywood; 2023.

H. PS 20 - American Softwood Lumber Standard; 2021.

I. SPIB (GR) - Standard Grading Rules; 2021.

J. ANSI/SPRI/FM 4435/ES-1.

K. MEET FM I-90.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.06 WARRANTY

A. See Section 01 77 00 - Closeout Procedures for additional warranty requirements.

B. Correct defective work within a five (5) year period commencing on Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Southern Pine, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

C. Provide sustainably harvested wood; see Section 01 60 00 - Products for requirements.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.
   3. Kiln-dry and heat treated (KDHT).

E. Fire-retardant treated except in areas where adhesion occurs or unless noted otherwise.

F. If PT is used, it must be KDPT or KDHT. If not in contact with concrete, KDPT with KDHT above PT boards.

2.03 CONSTRUCTION PANELS

A. Composite wood products installed on the interior side of the weatherproofing envelope shall be labeled ULEF (ultra-low-emitting formaldehyde) OR NAF (no added formaldehyde) per the California Air Resources Board ATCM for formaldehyde.

B. Roof Sheathing: PS 1 type. No OSB is permitted. Only CDX plywood is acceptable.
   1. Bond Classification: Exterior.
   2. Span Rating: 60.
   3. Performance Category: 3/4 PERF CAT.

C. Wall Sheathing: For sheathing at metal step flashing and metal siding, but not limited to other areas indicated in the Drawings: PS 1 type. No OSB is permitted. Only CDX plywood is acceptable.
   1. Bond Classification: Exterior.
   2. Grade: Structural I Sheathing.
   3. Span Rating: 16.

4. Performance Category: 5/16 PERF CAT.
5. Edge Profile: Square edge.
6. Fire-retardant treated except in areas where adhesion occurs or unless noted otherwise.

D. Wall Sheathing: Plywood, PS 1 , Grade C-C, Exterior Exposure.
1. At roof side of parapets accepting roof membrane and other areas indicated in Drawings.
2. Kiln-dried, heat treated.

2.04 ACCESSORIES

A. Fasteners and Anchors:
1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
2. Wood: Exterior fasteners - Fasteners, including nuts and washers, for fire-retardent-treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Staples shall be of stainless steel. Fasteners other than nails, staples, timber rivets, wood screws, and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B6955, Class 55 minimum.
3. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
1. Fire-Retardant Treated (FRT) Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2. Preservative-Treated (PT) Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
1. Manufacturers:
a. Lonza Group: www.wolmanizedwood.com/#sle.
b. Hoover Treated Wood Products, Inc: www.frtw.com/#sle.
c. Substitutions: See Section 01 60 00 - Products.
2. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Treat all exterior rough carpentry items.
c. Heat treated.
d. Do not use treated wood in direct contact with the ground.
3. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Treat rough carpentry items as indicated.
c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
   1. Manufacturers:
      a. Lonza Group: www.wolmanizedwood.com/#sle.
      b. Viance, LLC: www.treatedwood.com.
      c. Osmose, Inc: www.osmose.com.
      d. Substitutions: See Section 01 60 00 - Products.
   2. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
      b. Heat treated.
      c. Treat lumber exposed to weather.
      d. Treat lumber in contact with roofing, flashing, or waterproofing.
      e. Treat lumber in contact with masonry or concrete.
      f. Treat lumber less than 18 inches above grade.
      g. Treat lumber in other locations as indicated.
      h. Treat lumber used as blocking in all exterior wall applications.
   3. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
      a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
      b. Treat plywood in contact with roofing, flashing, or waterproofing.
      c. Treat plywood in contact with masonry or concrete.
      d. Treat plywood less than 18 inches above grade.
      e. Treat plywood in other locations as indicated.

PART 3 - EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. Provide the following specific non-structural framing and blocking:
   1. Field-fabricated curbs.
   2. Pipe or equipment supports as indicated on Drawings.
   3. Parapets.
   4. Any locations indicated in Drawings.

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where specifically indicated otherwise. Form corners by alternating lapping side members.

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
   1. At long edges, provide solid edge blocking where joints occur between roof framing members.
   2. Nail panels to framing; staples are not permitted.

B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
   1. Place water-resistive barrier horizontally over wall sheathing, weather-lapping edges and ends.

3.06 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Control for field testing and inspection requirements.

3.08 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 74 19 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06 10 00

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SECTION 07 01 50
PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Replacement of existing roofing system in preparation for entire new roofing system.

B. Removal of existing flashing and counterflashings.

C. Temporary roofing protection.

1.02 RELATED REQUIREMENTS

A. Section 07 53 23 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing System for roofing recover material requirements.

B. Section 07 62 00 - Sheet Metal Flashing and Trim for replacement of flashing and counterflashings.

C. Section 07 71 00 - Roof Specialties for manufactured roof edge/fascia systems.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 22 00 - Unit Prices, for additional unit price requirements.
   1. Provide the following work using the unit price method. For deck repairs, Contractor shall submit proposed repair details from a licensed structural engineer to the Owner, Owner's Consultant, and Architect for review. See Drawings.
   2. New Insulation:
      a. Basis of Measurement: By square foot.
      b. Basis of Payment: Includes complete removal of existing insulation, replace with new insulation having thermal resistance (R-value) of R-30.
   3. Existing Insulation - Full Removal:
      a. Basis of Measurement: By square foot.
      b. Basis of Payment: Includes removal of existing insulation, replace with new insulation of same thermal resistance (R-value) of R-30.
   4. Repair Existing Roof Metal Decking:
      a. Basis of Measurement: By ten (10) square foot.
      b. Basis of Payment: Includes repairing existing deck surface and covering with sheet metal.
   5. Repair Existing Roof Gypsum Decking:
      a. Basis of Measurement: By ten (10) square foot.
      b. Basis of Payment: Replacing decking with new material of same thickness.
   6. Repair Existing Roof Tectum Decking:
      a. Basis of Measurement: By fifteen (15) square foot.
      b. Basis of Payment: Replacing decking with new material of same thickness.
   7. Repair Existing Roof Concrete Decking:
      a. Basis of Measurement: By ten (10) square foot.
      b. Basis of Payment: Replacing decking with new material of same thickness.
   8. Repair Existing Roof LWC Decking:
      a. Basis of Measurement: By ten (10) square foot.
      b. Basis of Payment: Replacing decking with new material of same thickness.

1.04 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).

B. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.

C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.

D. ASTM C728 - Standard Specification for Perlite Thermal Insulation Board; 2017a (Reapproved 2022).

E. ASTM C1153 - Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging; 2010 (Reapproved 2015).

F. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

G. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2017.

H. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing; 2015a (Reapproved 2021).

I. ASTM D312/D312M - Standard Specification for Asphalt Used in Roofing; 2016a (Reapproved 2023).

J. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011 (Reapproved 2023).

K. ASTM D4601/D4601M - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing; 2004 (Reapproved 2020).

L. PS 1 - Structural Plywood; 2023.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with affected mechanical and electrical work associated with roof penetrations.

B. Preconstruction Meeting: Convene one week before starting work of this section.
   1. Attendees:
      a. Architect.
      b. Contractor.
      c. Owner.
      d. Owner's Consultant
      e. Installer.
      f. Roofing system manufacturer's field representative.
      g. Inspection and Testing Agency Representatives.
   2. Meeting Agenda: Provide agenda to participants prior to meeting in preparation for discussions on the following:
      a. Removal and installation schedule.
      b. Necessary preparatory work.
      c. Protection before, during, and after roofing system installation.
      d. Removal of existing roofing system.
      e. Installation of new roofing system.
      f. Temporary roofing and daily terminations.
      g. Transitions and connection to and with other work.
      h. Inspections and testing of installed systems.

C. Schedule work to coincide with commencement of installation of new roofing system.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Product Data: Submit for each type of material.

C. Shop Drawings: Indicate size, configuration, and installation details.

D. Preconstruction Test Reports.

E. Materials Removal Company Qualification Statement.

F. Installer's Qualification Statement.

G. Preconstruction Testing Agency Qualification Statement.

1.07 QUALITY ASSURANCE

A. Materials Removal Company Qualifications: Company specializing in performing work of type specified with at least five (5) years of documented experience.
   1. Comply with EPA notification regulations prior to start of roofing removal work.
   2. Comply with removal and disposal regulations of local authorities having jurisdiction (AHJ).

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five (5) years of documented experience.
   1. When same installer as new roofing system, comply with related requirements of Section indicated for new roofing system.
   2. Approved by existing roofing system warrantor to work on existing warranted roof system.

C. Preconstruction Testing: Conduct testing by an independent test agency, in accordance with provisions of Section 01 40 00 - Quality Requirements.
   1. Infrared Roof Moisture Survey: Conduct ground-based, walk-over type survey of roofing system in accordance with ASTM C1153.
      a. Conduct survey using non-destructive testing (NDT) procedures.
   2. Submit report of roofing survey including thermal images of suspect roof areas and corresponding daytime photos of these same areas.
   3. Provide required testing to locate hazardous materials, such as asbestos, by licensed agency as required for project location.

1.08 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

1.09 FIELD CONDITIONS

A. Existing Roofing System: See drawings.

B. Do not remove existing roofing membrane when weather conditions threaten the integrity of building contents or intended continued occupancy.

C. Maintain continuous temporary protection prior to and during installation of new roofing system.

D. Contractor shall coordinate activities that will affect normal building operations with the Owner to accommodate the academic schedule and student safety.

E. Coordinate work activities daily with Owner so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire alarm or -detection equipment if needed, and evacuate occupants from below the work area.

F. Verify that occupants have been evacuated from building areas when work on structurally impaired roof decking is scheduled to begin.

G. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

H. Owner will occupy building areas directly below re-roofing area.
   1. Provide Owner with at least 14 days written notice of roofing activities that may affect their operations and to allow them to prepare for upcoming activities as necessary.
   2. Do not disrupt Owner's operations or activities.
   3. Maintain access of Owner's personnel to corridors, existing walkways, and adjacent buildings.

1.10 WARRANTY

A. See Section 01 77 00 - Closeout Procedures for additional warranty requirements.

B. Existing Warranties: Perform this work using methods and materials that will maintain existing roof system warranties.
   1. Notify existing roof system warrantor prior to starting this work and obtain written instructions for procedures necessary to maintain this existing warranty.
   2. Upon completion of this work, notify warrantor of reroofing completion and obtain documentation to verify that existing roofing system has been inspected and warranty is still in effect.
      a. Submit documentation upon project closeout.

C. Special Warranty: Manufacturer's standard form, without monetary limitation (No Dollar Limit), in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
   1. Special full system warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, substrate board, and walkway products and other components of membrane roofing system.
   2. Warranty Period: Twenty (20) years from Date of Substantial Completion.

D. Special Project Warranty: Provide roofing contractor's warranty covering labor and/or material defects for all labor and materials installed under this contract.
   1. Include any and all labor and materials required to repair or replace any materials damaged, deteriorated, or otherwise altered as a result of roof leaks attributed to material and or improper or inadequate workmanship.
   2. Warranty Period: Five (5) years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 COMPONENTS

A. See the following sections for additional information on components relating to this work:
   1. Replacement and removal of existing roofing system in preparation for entire new roofing system, see Section 07 53 23 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing System.
   2. Remove existing flashing and counterflashings in preparation for replacement of these materials as part of this work, see Section 07 62 00 for material requirements.

2.02 MATERIALS

A. Patching Materials: Provide necessary materials in accordance with requirements of existing roofing system.

B. Temporary Roofing Protection Materials:
   1. Plastic Sheeting: Provide polyethylene sheets; use weights to retain sheeting in position.
   2. Roof Sheathing: PS 1 type. No OSB is permitted. Only CDX plywood is acceptable.
      a. Bond Classification: Exterior.
      b. Performance Category: 3/4 PERF CAT.
      c. Span Rating: 60.
   3. Plywood Sheathing: PS 1, Grade C-D, Exposure I.
   4. XPS Sheathing: Extruded Polystyrene (XPS) board insulation, ASTM C578.
      a. Board Size: 48 by 96 inches (1,220 mm by 2,440 mm).
      b. Board Thickness: 3/4 inch (19 mm).
      c. Board Edges: Tongue-and-groove.
      d. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88) per 1 inch (25.4 mm) at 75 degrees F (24 degrees C) mean temperature using ASTM C177 test method.
      e. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
      f. Type and Board Density: Type IV, 1.45 pcf (23 kg/cu m), minimum.
      g. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.

5. Fiber Insulation Board: ASTM C208, Type II, Grade 1 cellulosic fiber insulating board, with natural surface finish.
   a. Compressive Strength: 14.5 psi (100 kPa), minimum.
   b. Board Size: 24 by 48 inches (610 by 1,219 mm).
   c. Board Thickness: 1/2 inch (12.7 mm).
   d. Thermal Conductivity, K-value (Ksi-value): 0.38 (0.055).
   e. Board Edges: Square.

C. Roofing Recover Materials:
   1. General: Preformed roof insulation boards manufactured or approved by EPDM roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated. See Section 07 53 23 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing System for roof insulation requirements.
   2. Glass Mat Gypsum Substrate: ASTM C1177/C1177M, Type X (special fire-resistant) and moisture resistant.
      a. Board Size: 4 by 8 ft (1.2 by 2.4 m).
      b. Board Thickness: 1/2 inch (12.7 mm).
      c. Board Edges: Square.
   3. Fiber-Reinforced Gypsum Roof Board Panels: ASTM C1278/C1278M, water-resistant.
      a. Board Size: 4 by 8 ft (1.2 by 2.4 m).
      b. Board Thickness: 1/2 inch (12.7 mm).
      c. Board Edges: Square.
   4. Fiber Insulation Board: ASTM C208, Type II, Grade 2 cellulosic fiber insulating board, 1-1/2 inches (38 mm) thick.
      a. Board Size: 4 by 8 ft (1.2 by 2.4 m).
      b. Board Edges: Square.
   5. Perlite Recover Board: ASTM C728, Type 2 perlite thermal insulation board.
      a. Compressive Strength: 45 psi (310 kPa), minimum, at 10 percent deformation.
      b. Board Size: 2 by 4 ft (6.1 by 1.2 m).
      c. Board Thickness: 1/2 inch (12.7 mm).
      d. Thermal Resistance, R-value (RSI-value): 1.3 (0.23) at 75 degrees F (24 degrees C) mean temperature using ASTM C177 test method.

2.03 ACCESSORIES

A. Fasteners: Type and size as required and compatible with existing and new roofing system to resist local wind uplift.

B. Sheathing Paper: Red rosin paper type, at least 3 lb/100 sq ft (1.36 kg/9.3 sq m).

C. Base Sheet: Non-perforated, asphalt-coated glass fiber base sheet, Type II in accordance with ASTM D4601/D4601M.

D. Glass Fiber Felt: Asphalt-impregnated, glass fiber felt, Type IV in accordance with ASTM D2178/D2178M.

E. Asphalt Primer: Apply to concrete decking in preparation for temporary roofing, Type II in accordance with ASTM D41/D41M.

F. Roofing Asphalt: Type III or Type IV, in accordance with ASTM D312/D312M.

G. Roof Vent Pipe Extension: Solid-wall PVC fitting consisting of pipe and splice sleeve inserts, configured for insertion and sealing to existing plumbing vent piping, sized to fit inside diameter of plumbing vent piping, enabling extension of piping to field-determined height to meet local building code requirements for plumbing vent pipe height above existing roof level.
   1. Existing Vent Pipe Diameter: 2 inches (51 mm), nominal.
   2. Splice Sleeve Insert Length: 6 inches (152 mm), nominal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing roof surface has been cleared of materials being removed from existing roofing system and ready for next phase of work as required.

3.02 PREPARATION, GENERAL

A. Sweep roof surface clean of loose matter.

B. Remove loose refuse and dispose of properly off-site.

3.03 MATERIAL REMOVAL

A. Notify Owner each day of extent of roof tear-off proposed for that day.

B. Remove only existing roofing materials that can be replaced with new materials the same day.

C. Remove metal counter flashings.

D. Scrape roofing gravel from membrane surface without causing serious damage to membrane felts.

E. Remove damaged portions of roofing membrane, perimeter base flashings, flashings around roof protrusions and insulation vents.

F. Cut and lay flat any membrane blisters.

G. Remove damaged insulation and fasteners, cant strips, and blocking.

H. Remove vapor retarder, sheathing paper, underlay, and adhesive.

I. Repair existing deck surface to provide smooth working surface for new roof system.

J. Pollution Control: Comply with environmental regulations and AHJs. Limit spread of dust and debris.

1. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
2. Remove debris from building roof by chute, hoist, or other device that will convey debris to grade level.

3.04 DECK AND PARAPET PREPARATION

A. Inspect deck after tear-off of membrane roofing system.

B. Verify that deck is sound and dry.

C. Per existing building code, once the roof system is removed, Contractor shall have a licensed engineer inspect all building parapets and cantilevered elements for compliance with seismic codes and regulations. Where deficiencies exist, Contractor shall notify the Owner, Architect, and Owner's Consultant.

D. 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. Do not proceed with installation until directed by Architect.

E. Unsuitable Deck: If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Contractor shall have a licensed structural engineer inspect damaged areas and provide stamped details for deck and structural repair. Do not proceed with installation until directed by Architect.

3.05 EQUIPMENT REMOVAL AND REINSTALLATION

A. General: Remove, store, protect, and reinstall rooftop equipment as required to accommodate roof tear-off and subsequent roofing work.

1. Raise roof curbs, equipment mountings, and other roof penetration flashings as required to accommodate additional insulation thickness and maintain base flashing height of not less than 8 inches (200 mm), unless otherwise indicated.

a. Provide wood assemblies and additional support with miscellaneous galvanized steel angles, as required to rebuild or raise existing roof curbs.
b. Extend vent and soil stacks and other roof penetrations, using matching materials, as required to accommodate additional insulation thickness.

B. Remove and dispose of designated abandoned equipment. Coordinate with Owner to determine equipment to be removed. Infill openings in deck with matching materials. Infill roofing system with materials of same type as existing, adjacent roofing system.

3.06 INSTALLATION

A. Coordinate scope of this work with requirements for installation of new roofing system, see Section 07 53 23 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing System for additional requirements.

3.07 FIELD QUALITY CONTROL

A. Independent agency inspection and testing will be provided under provisions of Section 01 40 00.

B. Inspection firm will identify the approximate limits to material removal.

C. Testing will identify the condition of existing materials and their reuse, repair or removal.

D. Test Reports: Indicate existing insulation moisture content and existing bitumen quality.

3.08 PROTECTION

A. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

B. Temporary Weather Protection: During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

C. Roof Drain Protection: Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing membrane roofing system components that are to remain.
2. Prevent debris from entering or blocking roof drains and conductors.

D. Provide protection of existing roofing system that is not having work performed on it.

E. Provide temporary protective sheeting over uncovered deck surfaces.

F. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.

G. Provide for surface drainage from sheeting to existing drainage facilities.

H. Do not permit traffic over unprotected or repaired deck surface.

I. Install recover board over exposed deck surface where indicated on drawings.

3.09 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
1. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

3.10 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by preparation for re-roofing operations. Return adjacent areas to condition existing before operations began.

END OF SECTION 07 01 50

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SECTION 07 53 23
ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Adhered ethylene-propylene-diene-monomer (EPDM) roofing system.

B. Roof insulation.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry for wood nailers, curbs, and blocking.

B. Section 07 60 00 - Flashing and Sheet Metal for sheet metal roof flashings and counterflashings.

C. Section 07 92 00 - Sealants and Caulking for joint sealants, joint fillers, and joint preparation.

1.03 REFERENCE STANDARDS

A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.

B. ASTM D1079 - Standard Terminology Relating to Roofing and Waterproofing; 2020.

C. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).

D. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2020a.

E. ASTM G154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials; 2023.

F. ASTM G155 - Standard Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials; 2021.

G. FM 4470 - Examination Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for Use in Class 1 and Noncombustible Roof Deck Construction; 2022.

H. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

I. ASTM G 152.

J. ASTM D 3746.

K. ASTM D 4272.

1.04 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D1079 and glossary of “The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.05 PRECONSTRUCTION MEETING

A. Preconstruction Roofing Conference: Conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's Consultant, Owner's insurer (if applicable), testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.06 ACTION SUBMITTALS

A. Prepare submittals per requirements of Section 01 33 00 - Submittals.

B. Product Data: For each type of product.

C. Product Data: Roofing system components.
1. Roof membrane.
2. Roof insulation.
3. Fasteners and adhesives.

D. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
1. Base flashings and membrane terminations.
2. Tapered insulation, including slopes and calculation of average R-values.
3. Crickets, saddles, and tapered edge strips, including slopes.
4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

E. Samples for Verification:
1. Sheet roofing, of specified color.
2. Walkway pads or rolls, of specified color.

1.07 INFORMATIONAL SUBMITTALS

A. Certification: Submit manufacturer's signed statement that Project design and conditions have been reviewed and that the installation will be fully warrantable if correctly installed. This informational submittal may be in the form of a copy of manufacturer's authorization to Installer to proceed with installation.

B. ICC Evaluation Service Reports for roofing system and components.

C. Preconstruction meeting records.

D. Manufacturer's Inspection Reports: Submit copies of inspection reports and punch lists prepared by representatives of membrane manufacturer within 2 working days of their receipt by Installer.

E. Installer Certificates: Signed by roofing system manufacturer certifying that installer is approved, authorized, or licensed by manufacturer to install roofing system.

1.08 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

B. Manufacturer warranties.

C. Inspection Report: Copy of roofing system manufacturer’s inspection report of completed roofing installation.

1.09 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project.

B. Installer Qualifications: Approved, authorized, or licensed by membrane roofing system manufacturer to perform warranted installations and has minimum five (5) years successful experience in application of specified roof system.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Comply with applicable requirements of 01 60 00 - Products.

B. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

C. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
   1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

D. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

E. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.11 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.12 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation (No Dollar Limit), in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
   1. Special full system warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, substrate board, and walkway products and other components of membrane roofing system.
   2. Warranty Period: Twenty (20) years from Date of Substantial Completion.

B. Special Project Warranty: Provide roofing contractor's warranty covering labor and/or material defects for all labor and materials installed under this contract.
   1. Include any and all labor and materials required to repair or replace any materials damaged, deteriorated, or otherwise altered as a result of roof leaks attributed to material and or improper or inadequate workmanship.
   2. Warranty Period: Five (5) years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
   1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G154, or ASTM G155.
   2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. Roofing System Design:
   1. Corner Uplift Pressure: 105 lbf/sq. ft.
   2. Perimeter Uplift Pressure: 75 lbf/sq. ft.
   3. Field-of-Roof Uplift Pressure: 60 lbf/sq. ft.

D. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

F. Roofing, base flashings, and component materials shall be part of a roofing system, Class 1 or noncombustible construction, as applicable that meets the following requirements.
   1. Fire/Windstorm Classification: Class 1A-60.
   2. Terrain Surface Roughness Exposure: Category B.

2.02 EPDM ROOFING

A. Source Limitations: Obtain roofing system components from manufacturer of roofing membrane or as approved by roofing membrane manufacturer for warranted installations.

B. EPDM: ASTM D4637/D4637M, Type I, non-reinforced, uniform, flexible EPDM sheet.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Carlisle SynTec Incorporated.
      b. Elevate (Holcim Building Envelope).
      c. Johns Manville.
   2. Thickness: 60 mils, nominal.
   3. Exposed Face Color: Black.
   4. Substitutions must be submitted in accordance with Section 01 60 00 - Products. In addition to information requested in Section 01 60 00 - Products, manufacturer of EPDM system must include the following as per Part 1 of this Section:
      a. Installer Certificate.
      b. Installer Qualifications.
      c. Warranty.
      d. Manufacturers Qualifications.

2.03 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
   1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

B. Sheet Flashing: 60-mil- thick EPDM, partially cured or cured, according to application.

C. Protection Sheet: Epichlorohydrin or neoprene nonreinforced flexible sheet, 55- to 60-mil- thick, recommended by EPDM manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.

D. Bonding Adhesive: Manufacturer’s standard, non-water based.

E. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch- wide minimum, butyl splice tape with release film.

F. Lap Sealant: Manufacturer's standard, single-component urethane sealant in same color as roof membrane.

G. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.

H. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

I. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, prepunched.

J. Fasteners: Manufacturer approved factory-coated steel fasteners and metal or plastic plates (corrosion-resistant), designed for fastening membrane to substrate.

K. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced laminated EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, expansion joints, and other accessories.

2.04 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by EPDM roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
   1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
      a. Carlisle SynTec Incorporated.
      b. Elevate (Holcim Building Envelope).
      c. Johns Manville.
   2. Minimum R-30 R-value.
   3. Where overall insulation thickness is 2.6 inches or greater, install two or more layers. No single layer shall exceed 2.6 inches.

C. Tapered Insulation: Where noted on the Drawings, provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.

D. Provide factory- or shop-formed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated. Crickets to be sloped 1/2 inch per 12 inches unless otherwise specified.

E. Roof insulation to be staggered 12” min in all directions and in all layers.

2.05 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.

B. Adhesive: Adhesives recommended by insulation manufacturer designed for fastening roof insulation and cover boards to substrate, and approved by roofing system manufacturer for the specific project requirements.

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

2.06 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resistant, surface-textured walkway pads, approximately 3/16 inch thick and acceptable to roofing system

manufacturer. Walkways shall be located for easy access from the edge of roof or roof access point to HVAC units, kitchen exhaust hoods, and other roof-mounted equipment.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
   1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
   2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
   3. Verify that the existing structure is adequate for the new material being placed. Contractor and Installer to consult with a structural engineer if required to determine adequacy of existing structure for their products.

B. After removal of existing roof to existing fire rated gypsum barrier over existing deck, Contractor to inspect existing fire rated gypsum for deterioration or other damage. Contractor to replace fire rated drywall that has deteriorated or was damaged prior to Contractor commencement of work per 01 22 00 - Unit Prices. Contractor to replace any damaged fire rated drywall caused by the Contractor’s demolition or roof replacement activities at Contractor’s expense. Contractor to prep fire rated drywall to receive new material per manufacturer’s recommendations.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.03 ROOFING INSTALLATION, GENERAL

A. Comply with applicable requirements of individual Sections.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.04 INSULATION INSTALLATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Install base sheet layer(s) as required for all existing substrates.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install insulation under area of roofing to achieve required minimum R30 R-value. Where overall insulation thickness is 1.5 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer minimum 12 inches in each direction.

E. Trim surface of insulation sumping where necessary at roof drains so completed surface is flush and does not restrict flow of water.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

G. Adhered Insulation at Concrete, Tectum, Gypsum, and LWC Substrates: Install each layer of insulation and adhere to substrate as follows:
   1. Set each layer of insulation in insulation adhesive firmly pressing and maintaining insulation in place.
      a. LWC, Tectum, and Gypsum require a base sheet.

H. Mechanically Fastened Insulation at Metal and Wood Substrates: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
   1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

3.05 ADHERED MEMBRANE ROOFING INSTALLATION

A. Adhere roofing over area to receive roofing according to membrane roofing system manufacturer’s written instructions. Unroll membrane roofing and allow to relax before installing.

B. Accurately align roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

C. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer and allow to partially dry before installing roofing. Do not apply to splice area of roofing.

D. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeters, if required by manufacturer for warranty.

E. Apply roofing with side laps shingled with slope of roof deck where possible.

F. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement, and firmly roll side and end laps of overlapping roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing terminations.
   1. Apply a continuous bead of in-seam sealant before closing splice if required by roofing system manufacturer.

G. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing terminations.

H. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

I. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal membrane roofing in place with clamping ring.

3.06 BASE FLASHING INSTALLATION

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

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 splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.07 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products as described in Part 2 of this Section and as approved by Owner's Consultant. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.08 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Control for additional requirements.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

C. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, shall be performed to determine compliance of replaced or additional work with specified requirements.

E. Testing Agency: Owner will engage testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Architect.

3.09 PROTECTING AND CLEANING

A. See Section 01 77 00 - Closeout Procedures and Section 01 74 00 - Cleaning for additional requirements.

B. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect, Owner, and Owner's Consultant.

C. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 07 53 23

SECTION 07 60 00
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings and counterflashings.

B. Sealants for joints within sheet metal fabrications.

C. Reglets and accessories.

D. Closure trim at interfaces indicated in drawings.

E. Membrane-coated flashings and counterflashings.

1.02 RELATED REQUIREMENTS

A. Section 04 01 20 - Unit Masonry Restoration.

B. Section 06 10 00 - Rough Carpentry for wood nailers for sheet metal work.

C. Section 07 71 00 - Roof Specialties for flashings, snow guards, and miscellaneous accessories.

D. Section 07 92 00 - Sealants and Caulking for sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2022.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

E. CDA A4050 - Copper in Architecture - Handbook; current edition.

F. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

G. MEET FM I-90.

H. ANSI/SPRI/FM 4435/ES-1.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preconstruction Meeting: Convene one week before starting work of this Section. Mandatory attendance of the Installer's Project Manager, Superintendent, and Project Foreman to review Architect approved Submittals, Shop Drawings, and project particulars.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Samples: Submit two samples, 6 inch x 6 inch in size illustrating material of typical standing seam and external corner.

D. Samples: Submit two samples 6 inch x 6 inch in size illustrating metal finish color.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five (5) years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

1.08 GUARANTEE

A. Guarantee all flashings to remain weathertight. Flashings associated with Roof warranty shall be for a period of twenty (20) years from Date of Substantial Completion.

B. Finish Warranty: Provide manufacturer's standard twenty (20) year written warranty for finish applied to sheet metal items.

1.09 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation (No Dollar Limit), in which manufacturer agrees to repair or replace components specified in this Section that fail in materials or workmanship within specified warranty period.
   1. Special full system warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, substrate board, and walkway products and other components of membrane roofing system.
   2. Warranty Period: Twenty (20) years from Date of Substantial Completion.

B. Special Project Warranty: Provide roofing contractor's warranty covering labor and/or material defects for all labor and materials installed under this contract.
   1. Include any and all labor and materials required to repair or replace any materials damaged, deteriorated, or otherwise altered as a result of roof leaks attributed to material and or improper or inadequate workmanship.
   2. Warranty Period: Five (5) years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Sheet Metal Flashing and Trim Manufacturers:
   1. Sheet metal flashing and trim to be supplied from the same manufacturer as the roof system.

2.02 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 22 gauge, 0.0299 inch thick base metal, shop pre-coated with PVDF coating.
   1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   2. Color: As selected by Architect from manufacturer's custom colors.

B. Stainless Steel: ASTM A666, Type 304 alloy, soft temper, 20 gauge, 0.0375 inch thick; smooth No. 4 - Brushed finish.

2.03 FLASHING MATERIALS

A. Flashing, trim, and gravel stops, etc., exposed to view, shall be prefinished 24 gauge (or as required by the girth dimension in accordance with SMACNA (ASMM) galvanized steel, smooth surface and Kynar 500 full-strength Fluoropolymer finish, color(s) as selected by Architect. Painted finish to match unless otherwise noted. No Paint Grip or field-finished products permitted. Provide flashing in 10 foot lengths, minimum. Provide 22 gauge cleats to prevent wind uplift and peel-off.

B. Roof area flashing and other miscellaneous sheet metal flashing installed in conjunction with the roof system (not exposed to view) shall have a painted finish to match the roof (unless

otherwise indicated or specified) and shall be fully cleated to resist wind uplift and peel-off. No Paint Grip or field-finished products permitted.

2.04 ACCESSORIES

A. Fasteners: Stainless steel, with soft neoprene washers.

B. Fasteners: Galvanized steel, with soft neoprene washers.

C. Primer: Zinc chromate type.

D. Underlayment: Roof membrane.

E. Slip Sheet: Rosin sized building paper at metal roof areas only.

F. Protective Backing Paint: Zinc molybdate alkyd.

G. Sealant to be Concealed in Completed Work: Manufacturer approved and warrantable sealant.

H. Sealant to be Exposed in Completed Work: Manufacturer approved sealant for warranty inclusion; colors from full range selected by Architect. No silicone shall be used.

I. Sealant: Manufacturer approved sealant for warranty inclusion.

J. Reglets: Surface mounted type, galvanized steel.

2.05 PREFINISHED GUTTERS AND DOWNSPOUTS

A. Provide thickness of material as required by SMACNA (ASMM) for the girth of the gutters and downspouts.

B. Gutters and downspouts shall be prefinished galvanized steel of the profile detailed. Finish shall be full-strength Kynar 500, color(s) as selected by Architect from manufacturer's standard color selections.

C. Provide prefinished hot-dipped galvanized, color-coordinated, galvanized steel support straps for anchorage of gutters and downspouts to structure.

D. Powder coated stainless steel saddles, galvanized hidden hangers. Include screens to be used.

2.06 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Select gauge to prevent oil canning in all lengths. Contractor shall notify Architect if a thicker gauge than specified is required to achieve the indicated sizes of flashings or fascias.

C. Fabricate cleats of same material as sheet, minimum 4 inches wide, interlocking with sheet.

D. Form pieces in longest possible lengths.

E. Hem exposed edges on underside 1/2 inch; miter and seam corners.

F. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

G. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

I. Fabricate flashings to allow toe to extend 2 inches over roofing material transitions. Return and brake edges.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

1. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant. Tool sealant to create ski slope configuration.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

D. Examine surfaces to which flashings and trim are to be applied. Verify that surfaces are smooth, properly prepared, and have adequate provisions for fastening metal into position before installation.

3.03 INSTALLATION

A. Surfaces to be covered with sheet metal shall be free from defects of every description.

B. Clean off dirt, rubbish, and other foreign materials before sheet metal work is started. Drive projecting nails flush.

C. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant.

D. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

E. Apply plastic cement compound between metal flashings and felt flashings.

F. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

G. Seal metal joints watertight.

H. Gutters and Downspouts:
   1. Gutters: Install 7 inch continuous gutters up to 30 feet max. Support gutters using specified support brackets spaced at 18 inch O.C. Anchor to wall using non-corrosive, non-bleeding anchors.
   2. Downspouts: Install 4 inch x 5 inch downspouts to terminate as shown on drawings. Support downspouts using specified anchor straps spaced at 48 inch O.C. Anchor to walls using non-corrosive, non-bleeding anchors, factory fabricated with factory elbow and fittings.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Control for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

C. Clean-Up: Remove bitumen, sealant, and adhesive.

D. Protect all installed sheet metal flashings and trim from damage. Contractor shall provide temporary protection at areas of high traffic, especially where material or personnel are being brought onto the roof over completed areas of flashing. Ladders and lifts shall not be erected against unprotected flashing. Contractor shall fully replace any components damaged or scratched by their own forces during the course of construction at no additional cost to Owner.

END OF SECTION 07 60 00

SECTION 07 71 00
ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured roof specialties, including fascias and through-wall scuppers.

B. Lamb's tongue drain nozzles.

1.02 RELATED REQUIREMENTS

A. Section 07 60 00 - Flashing and Sheet Metal.

B. Section 07 92 00 - Sealants and Caulking.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2022.

C. NRCA (RM) - The NRCA Roofing Manual; 2024.

D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Product Data: Provide data on shape of components, materials and finishes, anchor types, and locations.

C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

D. Samples: Submit two metal samples, 12 x12 inch in size, illustrating component shape, finish, and color.

E. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) details.

1.06 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation (No Dollar Limit), in which manufacturer agrees to repair or replace components specified in this Section that fail in materials or workmanship within specified warranty period.
   1. Special full system warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, substrate board, and walkway products and other components of membrane roofing system.
   2. Warranty Period: Twenty (20) years from Date of Substantial Completion.

B. Special Project Warranty: Provide roofing contractor's warranty covering labor and/or material defects for all labor and materials installed under this contract.
   1. Include any and all labor and materials required to repair or replace any materials damaged, deteriorated, or otherwise altered as a result of roof leaks attributed to material and or improper or inadequate workmanship.
   2. Warranty Period: Five (5) years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Roof Edge Flashings:
   1. OMG Roofing Products.
   2. Substitutions: See Section 01 60 00 - Products.

B. Pipe and Penetration Flashings:
   1. Portals Plus: www.portalsplus.com.
   2. Substitutions: See Section 01 60 00 - Products.

2.02 COMPONENTS

A. Though-Wall Scuppers
   1. Size as indicated on drawings.

B. Roof Edge Flashings: Fabricated to sizes required; mitered, welded corners, concealed fasteners. Shop fabricated is acceptable. No welding of painted metals. All gravel stop details need to be applicable to this Section.
   1. Configuration: Fascia securement for roof membrane.
   2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
   3. Material: Formed steel sheet, galvanized, 22 gauge, 0,03 inch thick, minimum.
   4. Finish: 70 percent polyvinylidene fluoride.
   5. Color: To be selected by Architect from manufacturer's custom range. Painted finish to match unless otherwise noted. No Paint Grip or field-finished products permitted.

C. Pipe and Penetration Flashing: Base of thermoplastic, compatible with sheet metal roof systems, and capable of accommodating pipes sized between 3/8 inch and 12 inch.

2.03 ACCESSORIES

A. Sealant for Joints in Linear Components: As recommended by component manufacturer.

B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.

C. Sealant: Type as specified in Section 07 92 00 - Sealants and Caulking.

2.04 FINISHES

A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; custom color to match approved sample.
   1. Color to match adjacent materials - See drawings for locations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Seal joints within components when required by component manufacturer.

C. Conform to NRCA (RM) drawing details as noted:
   1. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
   2. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

3. Coordinate installation of flashing flanges into reglets.

END OF SECTION 07 71 00

SECTION 07 71 23
MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pre-finished galvanized steel scuppers.

1.02 RELATED REQUIREMENTS

A. Section 07 60 00 - Flashing and Sheet Metal.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

1.04 DESIGN REQUIREMENTS

A. Conform to SMACNA (ASMM) for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.

C. Product Data: Provide data on prefabricated components.

D. Warranty: Submit specified manufacturer’s warranty and ensure that forms have been completed in Owner’s name and are registered with manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.

B. Prevent contact with materials that could cause discoloration, staining, or damage.

1.07 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation (No Dollar Limit), in which manufacturer agrees to repair or replace components of gutters and downspouts that fail in materials or workmanship within specified warranty period.
   1. Special full system warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, substrate board, and walkway products and other components of membrane roofing system.
   2. Warranty Period: Twenty (20) years from Date of Substantial Completion.

B. Special Project Warranty: Provide Contractor's warranty covering labor and/or material defects for all labor and materials installed under this contract.
   1. Include any and all labor and materials required to repair or replace any materials damaged, deteriorated, or otherwise altered as a result of improper or inadequate workmanship and/or materials.
   2. Warranty Period: Five (5) years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pre-Finished Galvanized Steel Sheet: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal.
   1. Finish: Shop pre-coated with PVDF (polyvinylidene fluoride) coating.
   2. Color: As selected from manufacturer's custom colors.
   3. Size: 7 inch wide minimum.

2.02 COMPONENTS

A. Scuppers: SMACNA (ASMM) standards.

B. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Anchoring Devices: In accordance with CDA requirements.

C. Fasteners: Stainless steel, with soft neoprene washers.

D. Factory fabricated 4 inch x 5 inch downspouts with pre-manufactured elbow.

E. Hangers: 1/4 inch wide, powder coated.

F. Screens: Senox Roll-Lock Black typical.

2.03 FABRICATION

A. Form gutters and downspouts of profiles and size indicated.

B. Fabricate with required connection pieces.

C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

D. Hem exposed edges of metal.

E. Fabricate gutter and downspout accessories; seal watertight.

2.04 FACTORY FINISHING

A. Fluoropolymer Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as scheduled.

B. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by finish system manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that surfaces are ready to receive work.

3.02 INSTALLATION

A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.

B. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.

C. 4 inch x 5 inch downspout typical at 30 feet maximum spacing. Contractor shall add downspouts as required to meet maximum spacing.

D. Slope gutters 1/8 inch per foot.

END OF SECTION 07 71 23

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Miscellaneous materials.

B. Roof curbs.

C. Pipe supports.

1.02 RELATED REQUIREMENTS

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

B. Section 07 53 23 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing System.

C. Section 07 60 00 - Flashing and Sheet Metal for manufactured fascia, gravel stops, gutters and downspouts, and counterflashing.

D. Section 07 92 00 - Sealants and Caulking.

E. Section 09 91 13 - Exterior Painting.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

G. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products; 2018.

H. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

I. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

J. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

K. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.

L. ASTM D395 - Standard Test Methods for Rubber Property—Compression Set; 2018.

M. ASTM D573 - Standard Test Method for Rubber — Deterioration in an Air Oven; 2004 (Reapproved 2019).

N. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2020.

O. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2023.

P. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 2023.

Q. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).

R. AAMA 621.

S. ASTM F2329.

T. ASTM D575.

1.04 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.
   5. Maintenance requirements.
   6. For smoke hatches, submit evidence of approval by evaluation agency specified.

C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
   1. Non-penetrating Rooftop Supports: Submit design calculations for loadings and spacings.
   2. Method of attaching roof accessories to roof or building structure.
   3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
   4. Required clearances.
   5. Snow Guards: Submit design calculations for loadings and spacings based on manufacturer testing.
   6. Submit shop drawings sealed and signed by a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

D. Certificate: For smoke hatches, provide certificate of approval from Authority Having Jurisdiction.

E. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
   3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

F. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.06 COORDINATION

A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.07 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from Date of Substantial Completion.

B. Special Warranty: Manufacturer's standard form, without monetary limitation (No Dollar Limit), in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
   1. Special full system warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, substrate board, and walkway products and other components of membrane roofing system.
   2. Warranty Period: Twenty (20) years from Date of Substantial Completion.

C. Special Project Warranty: Provide roofing contractor's warranty covering labor and/or material defects for all labor and materials installed under this contract.
   1. Include any and all labor and materials required to repair or replace any materials damaged, deteriorated, or otherwise altered as a result of roof leaks attributed to material and or improper or inadequate workmanship.
   2. Warranty Period: Five (5) years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet:ASTM A653/A653M, G90 (Z275) coating designation and mill phosphatized for field painting where indicated.
   1. Exposed Coil-Coated Finish: Pre-painted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
   2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).

B. Steel Shapes: ASTM A36/A36M, hot-dip galvanized according to ASTM A123/A123M unless otherwise indicated.

C. Steel Tube: ASTM A500/A500M, round tube.

D. Galvanized-Steel Tube: ASTM A500/A500M, round tube, hot-dip galvanized according to ASTM A123/A123M.

E. Steel Pipe: ASTM A53/A53M, galvanized.

F. Pipe Supports: Provide attachment fixtures complying with MSS SP-58 and as indicated.
   1. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion resistant material.
   2. See relevant piping system specification section for additional requirements.

2.02 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, fire-rated acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.

C. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide non-removable fastener heads to exterior exposed fasteners. Install fasteners flush with finish. Recess larger fastener heads and attachments in substrate (e.g. at wood parapets). Furnish the following unless otherwise indicated:
   1. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153/A153M or ASTM F2329.

D. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

E. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

2.03 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units with integral spring-type vibration isolators and capable of supporting superimposed live and dead loads and designated equipment loads and other construction indicated on Drawings with welded or mechanically fastened and sealed corner joints, stepped integral metal cant raised the thickness of roof insulation, and integrally formed deck-mounting flange at perimeter bottom.

B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.

C. Loads: As indicated on drawings. Seismic requirements to meet local codes.

D. Material: Zinc-coated (galvanized) steel sheet, 0.052 inch, 0.079 inch (2.01 mm) thick.
   1. Finish: Two-coat fluoropolymer, baked enamel, or powder coat.
   2. Color: As selected by Architect from manufacturer's full range.

E. Construction:
   1. Insulation: Factory insulated with 1-1/2-inch- (38-mm-) thick glass-fiber board insulation.
   2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
   3. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
   4. Fabricate curbs to minimum height of 12 inches above roof deck (300 mm) or 8” above finished roof surface, whichever is greater, unless otherwise indicated.
   5. Top Surface: Level around perimeter with roof slope accommodated by sloping the deck-mounting flange.
   6. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow. Slope of cricket to be 2x slope of adjacent roof sloping against curb.

2.04 PIPE SUPPORTS

A. Manufacturer: Pipe support systems to be supplied from the same manufacturer as the roof system.
   1. Curb base must be made of 100% recycled rubber and polyurethane prepolymer with a uniform load capacity of 500 pounds per linear foot of support. In addition, each base shall have a reflective red stripe.
   2. 6” wide with steel frame.

3. Attaching hardware: Zinc-plated threaded rod, nuts and attaching hardware per ASTM B633.
4. Performance:
    a. Density: 0.52 oz/cu in ASTM D575.
    b. Durometer Hardness: 67.2A ± 1 ASTM D575.
    c. Tensile Strength: 231 psi minimum ASTM D575.
    d. Compression Deformation: 5% at 70 psi and 72oF ASTM D395.
    e. Brittleness at Low Temp: -50oF ASTM D746.
    f. Weathering: 70 hours at 120oF ASTM D573.
        1) Hardness retained: 100% (±5%).
        2) Compressive strength: 100% (±5%).
        3) Tensile strength: 100% (±5%).
        4) Elongation retained: 100% (±5%).

2.05 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

C. Verify dimensions of roof openings for roof accessories.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions.
    1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
    2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
    3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
    4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces or by other permanent separation as recommended by manufacturer.

C. Roof Curb Installation: Install each roof curb so top surface is level.

D. Pipe Supports: Gas pipe spacing subject to local gas authorities. Use properly sized clamps to suit pipe (conduit) sizes.

E. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

3.04 REPAIR AND CLEANING

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

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 09 91 13 - Exterior Painting.

C. Clean exposed surfaces according to manufacturer's written instructions.

D. Clean off excess sealants.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

END OF SECTION 07 72 00

SECTION 07 72 33
ROOF HATCH

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Contractor shall furnish all labor and materials and perform all work required for the complete installation of the roof hatch.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications.

B. Section 07 53 23 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing System.

C. Section 07 60 00 - Flashing and Sheet Metal.

1.03 SUBMITTALS

A. Submit copies of shop drawings and complete technical data to the Architect for review.

1.04 GUARANTEE

A. Materials shall be free of defects in material and workmanship for a period of twenty (20) years from the Date of Substantial Completion. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge. Electrical motors, special finishes, and other special equipment (if applicable) shall be warranted separately by the manufacturers of those products. The installation of the roof hatch shall be watertight.

B. The guarantee required under Sections 07 53 23 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing System and 07 60 00 - Flashing and Sheet Metal of these Specifications shall include all flashing installed in conjunction with the roof hatch specified in the Section.

1.05 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation (No Dollar Limit), in which manufacturer agrees to repair or replace components of the roof hatch that fail in materials or workmanship within specified warranty period.
   1. Special full system warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, substrate board, and walkway products and other components of membrane roofing system.
   2. Warranty Period: Twenty (20) years from Date of Substantial Completion.

B. Special Project Warranty: Provide roofing contractor's warranty covering labor and/or material defects for all labor and materials installed under this contract.
   1. Include any and all labor and materials required to repair or replace any materials damaged, deteriorated, or otherwise altered as a result of roof leaks attributed to material and or improper or inadequate workmanship.
   2. Warranty Period: Five (5) years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Roof Hatch shall be a pre-manufactured, single leaf, ladder access hatch with 12” curb.

B. Basis-of-Design: Type ‘S’ Roof Hatch by Bilco Company.
   1. Material: 11-gauge aluminum cover and frame.
   2. Cover: Brake-formed, hollow metal design with 1” concealed fiberglass insulation, 3” beaded, overlapping flange, fully welded at corners and internally reinforced for 40 psf live load.
   3. Curb: 12” high with integral capflashing, 1" fiberboard insulation, fully welded at corners, and 3-1/2" mounting flange with 7/16" holes provided for securing frame to the roof deck.
   4. Gasket: Extruded EPDM rubber gasket permanently adhered to cover.
   5. Hinges: Heavy-duty pintle hinges with 3/8" Type 316 stainless steel hinge pins.

6. Latch: Slam latch with interior and exterior turn handles and padlock hasps.
7. Lift-Assistance: Compression spring operators enclosed in telescopic tubes. Automatic hold-open arm with grip handle release.
8. Finish: Aluminum Mill finish.
9. Hardware: Type 316 Stainless steel hinges. All other hardware is zinc plated/chromate sealed.

C. Existing Padlocks belong to the Owner and should be removed prior to demolition and turned over to the Owner.

D. Existing steel access ladders to be extended to accommodate new insulation and roof heights and maintain warranties in place. Contractor shall coordinate installation between the two items to work as a unit.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The roof hatch shall be installed in conjunction with Section 07 53 23 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing System and Section 07 60 00 - Flashing and Sheet Metal.

B. Prior to the application of the base ply of the roof system, bolt the roof scuttle to the PT FRT wood blocking at the prepared openings. The perimeter of the roof hatch shall be flashed and sealed by the roof system incorporating flashing and bonding adhesive furnished by the roof manufacturer. Completed flashing and sealing of the roof hatch shall be as recommended by the roofing manufacturer and shall be weatherproof.

C. Verify that other trades with related work are complete before installing the roof hatch. Mounting surfaces shall be straight and secure. Verify that the substrate is dry, clean, and free of foreign matter.

D. Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly.

3.02 ADJUSTING AND CLEANING

A. Apply protective coating to separate aluminum from incompatible materials.

B. Adjust movable parts for smooth operation. Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

C. Clean exposed surfaces per manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION 07 72 33

SECTION 07 92 00
SEALANTS AND CAULKING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Materials and installation of the sealants, joint backing and caulking, and pre-compressed foam control joints in masonry.

1.02 RELATED REQUIREMENTS

A. See individual Division 07 Sections for installation of sealant at all roofing systems details and existing equipment flashing details.

B. Section 09 91 13 - Exterior Painting for installation of caulk on paintable surfaces.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.

B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

C. ASTM C834 - Standard Specification for Latex Sealants; 2017.

D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2019.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

F. ASTM D1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2020.

G. ASTM D1667 - Standard Specification for Flexible Cellular Materials—Poly (Vinyl Chloride) Foam (Closed-Cell); 2017.

H. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for concrete Pavements; 2016.

I. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; current edition.

J. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.04 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Acceptable Manufacturers: Manufacturers shall be specified herein. Other manufacturers are acceptable subject to compliance with project requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten (10) years documented experience.

D. Installer Qualifications: Company specializing in performing the work of this section and with at least five (5) years of documented experience.

E. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

F. Before purchase of each required material, the Contractor shall confirm its compatibility with each other material to which it will be applied in the joint system.

G. Single Source Responsibility: Provide exterior joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants. The Contractor shall confirm its compatibility with each other material to which it will be applied in the joint system.

H. Manufacturers Preconstruction Adhesion and Compatibility Testing: Conduct manufacturer's standard testing of all sealant contact materials. Provide written report with recommendations for all special cleaning and/or priming requirements.

I. Manufacturer's Preconstruction Stain Testing: Test sealant substrates for resistance to staining per ASTM C1248 and provide written report of results and recommendations.

J. Preconstruction Conference: Convene one week before starting work of this section to review Architect approved submittals and project particulars.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.
   2. Required attendees to include Owner, Architect, Contractor (including PM, Superintendent, and project foremen), Window Installer (including PM, Superintendent, and Project Foreman), Window Manufacturers, Sealant Installer's Superintendent and Project Foreman, and representatives of all other subcontractors whose work may impact the Roofing, Plumbing, Electrical, HVAC, Masonry, and Metal Panels.

K. VOC Content for Interior Applications: Low VOC options of all materials shall be installed. Provide sealants and sealant primers complying with the following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):
   1. Architectural Sealants: 250 g/L.
   2. Sealant Primers for Nonporous Substrates: 250 g/L.
   3. Sealant Primers for Porous Substrates: 775 g/L.

1.05 SUBMITTALS

A. Submit copies of complete technical data and physical samples to the Architect in accordance with Section 01 33 00 - Submittals.

B. Submit a detailed list of all locations where materials will be used, type of caulking or sealants which will be used at each location, and names of all manufacturers of compounds, primers, and fillers which will be used.
   1. Product Data: Provide data indicating sealant chemical characteristics.
   2. Samples: Submit one sample, of each material 6 inches x 3/4 inches in size illustrating sealant colors for selection.
   3. Submit comprehensive color selections for ALL proposed sealants.
   4. Shop Drawings: Submit shop drawings for pre-compressed foam joints showing all joint splices, joint sizes, and anticipated movement.
   5. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, perimeter conditions requiring special attention, and limitations.

C. Product Test Reports: Written test reports based upon evaluation of comprehensive test performed by qualified testing agency indicating that each product complies with requirements. Include certification test reports for each sealant product, and pre-construction adhesion and compatibility test reports.

D. Manufacturer's Project Acceptances Document: Certification by the manufacturers that its products are approved, acceptable, suitable for use in specific locations, for specific details, and for applications indicated, specified, or required, and that the specified warranty will be issued.

E. Manufacturer's Pre-Construction Adhesion and Compatibility Test Reports for all sealant contact materials. The results should include all special cleaning and/ or priming requirements. Test results with any recommendations should be provided in writing prior to commencing installation.
   1. Samples of each Manufacturer's Warranty and each Installer's Guarantee.
   2. Statement of compliance from Manufacturer's Technical Field Representative.

1.06 JOB CONDITIONS

A. Copies of all technical bulletins relating to the installations of the various materials shall be on the job site at all times during the installation of all caulking and sealants. Workmen will be thoroughly familiar with these and the instructions therein shall be followed exactly.

B. Deliver materials to the job site in original, unopened containers. Materials are to be stored in a protected area between 40 - 80 degrees F.

C. Do not retain on the job site any material which has exceeded the shelf life recommended by its manufacturer.

D. Protect all surfaces from staining or damage. All damaged work shall be repaired or replaced as directed by the Architect and at no additional cost to the Owner.

1.07 WEATHER CONDITIONS

A. Do not proceed with installation of sealants under adverse weather conditions or when temperatures are below or above manufacturer’s recommended limitations for installation.

B. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.

C. Whenever joint width is affected by ambient temperature variations, install sealants only when temperatures are in the lower third of manufacturer’s recommended installation temperature range.

1.08 WARRANTY

A. See Section 01 77 00 - Closeout Procedures for additional warranty requirements.

B. Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants and accessories to repair or replace those that demonstrate deterioration or adhesive or cohesive failure, or do not cure under normal use within warranty period specified.
   1. No silicone sealants shall be used.
   2. Align sealants with an approved manufacturer to ensure inclusion in the warranty. Review all sealant manufacturers and revise as needed to meet roof manufacturer's warranty inclusion.
   3. Installed material - Five (5) years.

C. Special Warranty: Manufacturer's standard form, without monetary limitation (No Dollar Limit), in which manufacturer agrees to repair or replace components of joint sealants that fail in materials or workmanship within specified warranty period.
   1. Special full system warranty includes roofing membrane, base flashings, roofing accessories, roof insulation, fasteners, cover boards, substrate board, and walkway products and other components of membrane roofing system.
   2. Warranty Period: Twenty (20) years from Date of Substantial Completion.

D. Special Project Warranty: Provide roofing contractor's warranty covering labor and/or material defects for all labor and materials installed under this contract.
   1. Include any and all labor and materials required to repair or replace any materials damaged, deteriorated, or otherwise altered as a result of roof leaks attributed to material and or improper or inadequate workmanship.
   2. Warranty Period: Five (5) years from Date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Gunnable and Pourable Sealants:
   1. Dow Corning Corporation: www.dowcorning.com.
   2. Tremco Global Sealants: www.tremcosealants.com.
   3. Sika Corporation: www.usa-sika.com.
   4. Substitutions: See Section 01 60 00 - Products .

B. Preformed Compressible Foam Sealers for masonry control joints only:
   1. EMSEAL Joint Systems, Ltd: www.emseal.com.
   2. Dayton Superior Corporation: www.daytonsuperior.com.
   3. Tremco Global Sealants: www.tremcosealants.com.
   4. Substitutions: See Section 01 60 00 - Products.

2.02 MATERIALS

A. Colors: For concealed material provide any of manufacturer's standard colors; for exposed material provide manufacturer's standard colors as selected by the Architect, unless otherwise indicated.

B. Roofing Sealant: Reference Roofing specifications for all approved and compatible sealants. System shall be under one warranty.

C. Exterior Exposed Joints where bond substrates are porous (i.e., Concrete, Masonry, Cement, etc.):
   1. Provide two-part gun-grade polyurethane sealant in custom color to be selected by Architect; Urethane, M, NS, 50, T, NT: Multicomponent, non-sag, plus 50 percent and minus 50 percent movement capability, traffic- and non-traffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 50, Uses T and NT.: Percora "Dynatrol II", Bostik "Chem-Calk 500" or
   2. One-part, moisture-curing, gun-grade polyurethane sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.: Tremco "Vulkem 116", BASF "MasterSeal NP-1".

D. Exterior Concealed Joints: Provide butyl rubber base sealant; DAP "Butyl-Flex", Tremco "Butyl Sealant", or Bostik Products "Chem-Calk 300".

E. Joints at Floor or Paved Surfaces and Expansion Joints of Tiles and Pavers: Provide one part polyurethane sealant: Tremco "Vulkem 45SSL", BASF "MasterSeal SL2", or Bostik "Chem-Calk 550".

F. Solvents, primer, and cleaning agents shall be as recommended by the sealant/caulking manufacturers.

G. Preformed, Foam Joint Seals: Manufacturer's standard joint seal manufactured from urethane or EVA (ethylene vinyl acetate) foam with minimum density of 10 lb./cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths based on design criteria indicated, with factory- or field-applied adhesive for bonding to substrates.

H. Back-up materials for sealants and caulking shall be closed-cell polyethylene or other expandable non-staining filler, as recommended by and compatible with the sealant manufacturer. Back-up materials shall have a diameter of approximately 25% to 50% greater than the width of the joint.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Caulking and sealants shall be applied in strict accordance with the manufacturer's instructions.

B. Perform installation in accordance with ASTM C1193.

C. Prior to the installation of any caulking or sealant, all surfaces and joints must be completely clean, dry, and free from any dust or loose particles. Clean first with brush and dry cloth and then clean with an air brush using dry, oil-free air. Immediately after cleaning, prime, as required, the surfaces to be treated with the appropriate primer using a small clean paint brush reaching all parts of the area to be primed. Where primer is required, allow sufficient drying time before applying sealant.

D. Inspect the work of other trades prior to installation of caulking and sealants. Install no caulking or sealant in joints which are not in proper condition to receive sealant materials until defects are corrected.

E. All caulking and sealants shall be installed with guns having the proper size nozzles. Caulking and sealants shall be installed in uniform, continuous ribbons and shall fill all voids and joints solid. Every caulked joint shall be airtight. Every sealed joint shall be airtight and watertight. Joints in masonry and other areas of the building shall be slightly convex. Joints to be painted shall be even and smooth.

F. Prime or seal the joint surfaces. Do not allow primer/sealer to spill or migrate onto adjoining surfaces. All anodized aluminum surfaces to receive sealant shall be primed with a primer recommended by the sealant manufacturer, unless sealant manufacturer certifies, in writing, that primer is not required.

G. Install sealant backer rod for elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown or backed by other solid substrate. Back-up material shall be installed in joints deeper than ½ inch. Back-up material shall be set for approximately 3/8 inch depth of compound.

H. Install bond breaker tape wherever backer rod is not used and wherever required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.

I. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps of air pockets, with complete "wetting" of the joint bond surfaces equally on opposite sides.

J. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between horizontal surface and a vertical surface, fill joint to form a slight cove so that joint will not trap moisture and dirt.

K. Unless specifically dimensioned on Drawings, install sealants to depths recommended by the sealant manufacturer, but within the following general limitations:
   1. For walkways and floors and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75% of the joint width, but not more than 3⁄4 inch deep or less than 3/8 inch deep.
   2. Normal moving of joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50% of joint width, but not more than 1⁄2 inch deep or less than 1⁄4 inch deep.

L. Do not allow sealants to overflow or spill onto adjoining surfaces or to migrate into the voids of adjoining surfaces. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

M. In exterior work where sealant tape is used, provide cap sealant bead of the specified sealant.

N. Cure sealants in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength, and surface durability.

O. Apply sealants and caulking when temperatures are as recommended by the manufacturers. Consult manufacturer when sealant cannot be applied within these temperature ranges. Apply exterior sealants when the weather forecast does not include precipitation for 8 or more hours. Storage of all material shall be at room temperature with material being used on a first-in, first-out basis.

P. Caulking and sealants application shall include, but is not limited to the following:
   1. Joints in building facade.
   2. Control joints and expansion joints, as detailed and as required for a weathertight structure.
   3. Joints in walk and slabs and all other traffic-bearing surfaces where shown on drawings.
   4. Between dissimilar materials.
   5. Perimeter of storefronts and windows.
   6. At areas to prevent the entrance of moisture.
   7. Other areas as detailed on the drawings.

Q. Tool joints concave.

R. Sealant to be installed over horizontal expansion joints shall be installed after area is cleaned and primed as outlined above. After compound is properly mixed, pour into joints using a small spouted oil type can. Sealant shall not be poured from the can in which it has been mixed. Fill in joints in a manner to avoid air voids. Bring to a level, even joint, slightly below the top of the paving. Minimum depth of the joint shall be ½ inch, unless specified or detailed otherwise.

S. Coordinate installation of sealant with application of clear masonry sealer.

T. Joints to be painted shall be even and smooth. Caulking that is to be painted shall be installed before the last coat of paint is applied.

3.02 CLEANING

A. Upon completion of the work, all excess materials shall be removed leaving joints neat, clean, and straight. Any cured material shall be removed by cutting with a sharp-edged tool. Thin films may be removed by abrading, but without damaging the finish of any other materials.

3.03 PROTECTION

A. Protect sealants until cured.

END OF SECTION 07 92 00

SECTION 09 91 13
EXTERIOR PAINTING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and other coatings.

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Exposed surfaces of steel lintels and ledge angles.
   3. Mechanical and Electrical:
      a. On the roof and outdoors, paint equipment that is exposed to weather or to view, including factory-finished materials.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory-finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically indicated.
   8. Ceramic and other types of tiles.
   9. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster, and stucco.
   10. Glass.
   11. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Control for general requirements for mock-ups.

B. Section 01 60 00 - Products for product requirements.

C. Section 05 50 00 - Metal Fabrications for shop-primed items.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.

B. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2023.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.

D. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2; 2017.

E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

F. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

G. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

H. SSPC-SP 2 - Hand Tool Cleaning; 2018.

I. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.

J. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   4. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, submit each color in each sheen available.
   3. Allow 30 days for approval process, after receipt of complete samples by Architect.
   4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Products for additional provisions.
   2. Extra Paint and Finish Materials: Quantity equal to 3% of each color total from the same product run. Store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum ten (10) years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five (5) years experience.

1.06 MOCK-UPS

A. See Section 01 40 00 - Quality Control for general requirements for mock-ups.

B. Provide panel, 12 feet long by 8 feet wide, illustrating paint color, texture, and finish.

C. Locate where directed by Architect.

D. Mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for exterior, unless required otherwise by manufacturer's instructions.

F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer. If more than one manufacturer is required, additional manufacturers shall be submitted to Architect for review. Contractor shall confirm in writing that the adjacent materials are compatible and warranty will be maintained across all systems and manufacturers.
   1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided acceptance by Architect is obtained using the specified procedures for substitutions.

B. Paints:
   1. Base Manufacturer: PPG Porter Paints.
   2. Benjamin Moore & Co: www.benjaminmoore.com.
   3. Sherwin-Williams Company: www.sherwin-williams.com/#sle.

C. Transparent Finishes:
   1. Base Manufacturer: PPG Porter Paints.

D. Stains:
   1. Base Manufacturer: PPG Porter Paints.

E. Primer Sealers: Same manufacturer as top coats.

F. Substitutions: See Section 01 60 00 - Products.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Supply each paint material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:
   1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.

b. SCAQMD 1113 Rule.
c. Architectural coatings VOC limits of Tennessee.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

C. Flammability: Comply with applicable code for surface burning characteristics.

D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

E. General Emissions Evaluation: Building Products (all paints and coatings) must meet the CAL (CDPH SM), using the applicable exposure scenario.

F. Colors: As indicated on drawings.
1. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint E-OP - Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including primed metal and galvanized metal.
1. Two top coats and one coat primer.
2. EXTERIOR FERROUS METALS, GALVANIZED
a. HIGH-PERFORMANCE FINISH - STRUCTURAL FRAMING, CANOPIES, HANDRAILS
1) Water-based Polyurethane - Gloss Finish.
b. Sherwin Williams.
1) Primer: Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (other acceptable primers: DTM Wash Primer, B71Y1 or MacroPoxy 646, B58 Series).
2) 1st coat: Water-based Acrolon® Ultra Polyurethane Gloss, B65 Series.
3) 2nd coat: Water-based Acrolon Ultra Polyurethane Gloss, B65 Series.
3. EXTERIOR FERROUS METALS
a. Sherwin Williams
1) Primer: Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (MPI 107) (< 100 g/l VOC, Greenguard Gold Product).
2) 1st coat: Waterbased Acrolon® 100 Polyurethane Gloss, B65-720 Series (MPI none) (< 100 g/l VOC).
3) 2nd coat: Waterbased Acrolon 100 Polyurethane Gloss, B65-720 Series (MPI none) (< 100 g/l VOC).
b. PPG
1) Primer: PPG Paints 90-912 Pitt Tech Plus Int/Ext Acrylic DTM Primer Finish (MPI #134) (90 g/L VOC) (v4 Product Type: Industrial Maintenance Coatings).
2) 1st coat: PPG Paints 90-1210 Series Pitt Tech Plus Int/Ext Acrylic S/G DTM Enamel (MPI #153) (90 g/L VOC).
3) 2nd coat: PPG Paints 90-1210 Series Pitt Tech Plus Int/Ext Acrylic S/G DTM Enamel (MPI #153) (90 g/L VOC) (v4 Product Type: Industrial Maintenance Coatings).
c. Benjamin Moore
1) Primer: Corotech Acrylic Metal Primer V110 (199 g/L).
2) 1st Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel, HP29 (45 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED V4.
3) 2nd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel, HP29 (45 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED V4.
4. EXTERIOR NON-FERROUS METALS: HIGH-PERFORMANCE FINISH
a. Sherwin Williams
1) Primer: Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (MPI 107) (< 100 g/l VOC, Greenguard Gold Product).

2) 1st coat: Pro Industrial Acrylic Semi-Gloss, B66-650 Series (MPI 141) (< 50 g/l VOC, Greenguard Gold Product).
3) 2nd coat: Pro Industrial Acrylic Semi-Gloss, B66-650 Series (MPI 141) (< 50 g/l VOC, Greenguard Gold Product).

b. PPG
1) Primer: PPG Paints 90-912 Pitt Tech Plus Int/Ext Acrylic DTM Primer Finish (MPI #134) (90 g/L VOC) (v4 Product Type: Industrial Maintenance Coatings).
2) 1st coat: PPG Paints 90-1210 Series Pitt Tech Plus Int/Ext Acrylic S/G DTM Enamel (MPI #153) (90 g/L VOC).
3) 2nd coat: PPG Paints 90-1210 Series Pitt Tech Plus Int/Ext Acrylic S/G DTM Enamel (MPI #153) (90 g/L VOC) (v4 Product Type: Industrial Maintenance Coatings).

c. Benjamin Moore
1) Primer: Corotech Acrylic Metal Primer V110 (199 g/L).
2) 1stCoat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel, HP29 (45 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED V4.
3) 2nd Coat: Benjamin Moore Ultra Spec HP D.T.M. Acrylic Semi-Gloss Enamel, HP29 (45 g/L), MPI # 141, X-Green 141, 153, X-Green 153, LEED V4.

5. CONCRETE + MASONRY AREAS (SMOOTH)
a. Sherwin Williams
1) Primer: Loxon Concrete & Masonry Primer Sealer, LX02W0050 (MPI 3) (< 50 g/l VOC, Greenguard Gold Product)
2) 1st coat: A-100 Exterior Latex Satin, A82 Series (MPI 15) (< 50 g/l VOC)
3) 2nd coat: A-100 Exterior Latex Satin, A82 Series (MPI 15) (< 50 g/l VOC)

b. PPG
1) Primer: PPG PermaCrete 4-603 Acrylic Alkali Resistant Primer (MPI #3) (88 g/L VOC) (v4 Product Type: Primers, Sealers)
2) 1st coat: PPG Paints 6-2045XI Series Speedhide Exterior Satin Acrylic House & Trim Paint (MPI #15) (<50 g/L VOC)
3) 2nd coat: PPG Paints 6-2045XI Series Speedhide Exterior Satin Acrylic House & Trim Paint (MPI #15) (<50 g/L VOC) (v4 Product Type: Non-Flat)

c. Benjamin Moore
1) Primer: Benjamin Moore Super Spec Interior/Exterior Acrylic High Build Masonry Primer N068 (97g/L), MPI # 3, LEED 2009.
2) 1st Coat: Benjamin Moore Regal Select Exterior High-Build Low Lustre N401 (40 g/L), MPI # 15, 315.
3) 2nd Coat: Benjamin Moore Regal Select Exterior High-Build Low Lustre N401 (40 g/L), MPI # 15, 315.

6. CONCRETE AND MASONRY AREAS (TEXTURED)
a. Sherwin Williams
1) Primer: Loxon Concrete & Masonry Primer Sealer, A24W8300 (MPI 3) (< 50 g/l VOC, Greenguard Gold Product).
2) 1st coat: Conflex Ultracrete Textured Masonry Topcoat Fine (MPI 41) CF17W0801 / Medium (MPI 42), CF17W0811 / Extra Coarse, CF17W0821 Series (<50 g/l VOC).
3) 2nd coat: Conflex Ultracrete Textured Masonry Topcoat Fine (MPI 41) CF17W0801 / Medium (MPI 42) CF17W0811, Extra Coarse, CF17W0821 Series (<50 g/l VOC).

b. PPG
1) Primer: PPG PermaCrete 4-603 Acrylic Alkali Resistant Primer (MPI #3) (88 g/L VOC) (v4 Product Type: Primers, Sealers).
2) 1st coat: PPG 4-60 Series PermaCrete Acrylic Int/Ext Texture Paint (MPI #42) (57 g/L VOC).

3) 2nd coat: PPG 4-60 Series PermaCrete Acrylic Int/Ext Texture Paint (MPI #42) (57 g/L VOC) (v4 Product Type: Waterproofing Concrete/Masonry Sealers).

c. Benjamin Moore
   1) Primer: Benjamin Moore Super Spec Interior/Exterior Acrylic High Build Masonry Primer N068 (97g/L), MPI # 3, LEED 2009.
   2) 1st Coat: Coronado Texcrete WB Acrylic Masonry Waterproofer Smooth Finish 3194 (90 g/L), LEED Credit.
   3) 2nd Coat: Coronado Texcrete WB Acrylic Masonry Waterproofer Smooth Finish 3194 (90 g/L), LEED Credit.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Verify if structural steel and exposed structural components are coated with intumescent paint or fireproofing. Contractor shall maintain fire rating of any existing intumescent condition. Contractor shall notify Architect if intumescent paint is discovered on building elements affected in the scope of the Contract.

G. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Exterior Plaster and Stucco: 12 percent.
   2. Fiber Cement Siding: 12 percent.
   3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
   5. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

D. Seal surfaces that might cause bleed-through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.

2. Clean surfaces with pressurized water. Use pressure range of 1500 to 4000 psi at 6 to 12 inches. Allow to dry.
3. Clean concrete according to ASTM D4258. Allow to dry.
4. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13/NACE No.6.

G. Masonry:
1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
2. Prepare surface as recommended by top coat manufacturer.
3. Clean surfaces with pressurized water. Use pressure range of 600 to 1500 psi at 6 to 12 inches. Allow to dry.

H. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

I. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP

J. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
2. Prepare surface according to SSPC-SP 2.

K. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6/NACE No.3. Protect from corrosion until coated.

L. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied. Back prime concealed surfaces before installation.

M. Exterior Wood to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior caulking compound after sealer has been applied. Prime concealed surfaces.

N. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with tinted primer.

O. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

P. Contractor shall be required to notify the Architect in writing of any concerns regarding the preparation of substrates to receive paint or coatings.

3.03 APPLICATION

A. Tape and protect all devices PRIOR to painting - including but not limited to thermostats, electrical devices, fire alarm devices, AV devices, and other wall and ceiling-mounted products exposed to view.

B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

C. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

D. Apply products in accordance with manufacturer's written instructions and recommendations in MPI (APSM).

E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

F. Apply each coat to uniform appearance.

G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.

H. Sand wood and metal surfaces lightly between coats to achieve required finish.

I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

J. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Control for general requirements for field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

C. Store attic stock in a location of the Owner’s choosing per manufacturer’s temperature and humidity recommendations

END OF SECTION 09 91 13