BALTIMORE
BRANDON M. SCOTT
Mayor

DEPARTMENT OF RECREATION AND PARKS
Reginald Moore
Director

CONTRACT RP 23888

Volume 2 of 2

FOR

LATROBE PARK – LONGHOUSE RESTORATION

1627 E. FORT AVE. BALTIMORE, MD 21230

VI. CONSTRUCTION DETAILS AND MATERIALS

SECTION 01 10 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes (not exclusively) the following:

1. Work covered by the Contract Documents.
2. Type of the Contract.
3. Use of premises.
4. Work restrictions.
5. Specification formats and conventions.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Latrobe Park Longhouse Restoration

B. Location: 1627 East Fort Avenue, Baltimore, MD 21230 – Block 2021 – Ward 24 – Section 011

C. Architect: RRMM Architects 3700 Koppers Street, Suite 300, Baltimore, MD 21201

D. The work consists of, but is not restricted to, the following:
1. Removal of existing metal panel roof and plywood sheathing down to existing structure.
2. Install new plywood sheathing and standing seam metal roof panels to match adjacent pavilion. All rake, eave, and ridge trim to be installed with manufacturer's standard construction details.
3. Strip all existing painted wood surfaces and restore with wood epoxy and stabilizer.
4. Prime and paint all wood surfaces of roof framing and structure.
5. Sawcut (3) new openings into existing 18" thick concrete base.
6. Install (4) painted steel benches with factory dividers.
7. Trench and install new polymer cast-in-place concrete trench drain and dry well.

1.4 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.5 USE OF PREMISES

A. General: Contractor shall have limited use of premises for construction operations, as limited to the area of work required for new work shown on the construction documents, and for the time period required to perform said work.

B. Use of Site: Limit use of premises to areas within the Contract limits indicated, and for the time period required to perform said work. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways and Entrances: Keep loading areas, and entrances serving premises clear and available to Engineer, Engineer 's employees and contractors, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

   a. Schedule deliveries to minimize use of loading areas and entrances.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

2. Owner reserves the right to require contractor to vacate specific locations/portions of the project where construction is substantially complete. At that time Contractor will adjust construction fencing and/or barriers to match reduced construction site. This vacation is commensurate with contractor ceasing all use, and Owner assuming responsibility for conditions of, said location.

1.6 CONSTRUCTION SEQUENCE

A. Demolition shall be accomplished in a carefully planned phased manner in order to maintain the structural integrity of structures on site that are existing to remain.

1.7 WORK RESTRICTIONS

A. Existing Utility Interruptions: Do not interrupt utilities serving facilities currently occupied by others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than 11 days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Engineer's written permission.

1.8 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "Master Format" numbering system.

1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used.
2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate.

Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

    a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

3. The word "days" refers to Calendar days unless specified otherwise.

4. "*Days of Completion*" in the Bid Form refers to a period beginning at *Notice to Proceed* and ending at *Final Completion.*

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 20 00 - MEASUREMENT AND PAYMENT

PART 1-GENERAL

1.01 BASIS OF PAYMENTS

A. Payment for work completed under this Contract will be made for the lump sum price and for the unit bid price. All prices shall include the furnishing of all labor, tools, equipment and materials and the performance of all work required to satisfactorily complete the Project as indicated and specified in the Contract documents and as determined by the Engineer. References to methods of measurement and/or payment in Standard Specifications, which are made part of the Specifications by reference for materials and construction, will not apply. Only the methods of measurement and payment outlined in this section will apply to the Bid items.

PART 2-DESCRIPTION OF PAYMENT

2.01 BID ITEM 101- Project Complete

A. The lump sum price for this item shall include full compensation for all work shown on the Drawings as outlined in the Specifications including Bid Item 201, as well as all Alternate Bid Items.

B. Measurement of unit quantities for this item will not be made.

C. Partial payment for this item will be made on the basis of percentage complete of the construction categories listed in the SCHEDULE OF VALUES. See 01 29 00.

END OF SECTION

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Engineer that are not required in order to meet other Project requirements but may offer advantage to Contractor or Engineer.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit one electronic copy of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A or facsimile of form provided in Project Manual (01 25 00.01).
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Engineer and separate contractors, that will be necessary to accommodate proposed substitution.
    c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers.
h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within **7** business days of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within **21** days of receipt of request, or **7** business days of receipt of additional information or documentation, whichever is later.

   a. Forms of Acceptance: Change Order, Construction Change Directive, or Engineer's Supplemental Instructions for minor changes in the Work.
   b. Use product specified if Engineer does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

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

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than **21** days prior to time required for preparation and review of related submittals, in order to meet Construction Schedule.

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

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

B. Substitutions for Convenience: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 25 00.01 – SUBSTITUTION REQUEST

TO: _____

PROJECT: _____

SPECIFIED ITEM:

_____ Section _____ Page _____ Paragraph _____ Description

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

_____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents which the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. All provisions of Section 01630 apply to this substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

SUBMITTED BY:

Signature _____ For use by the design consultant

Firm _____ [ ] Accepted [ ] Accepted as noted

Address _____ [ ] Not Accepted [ ] Received to late

_____ By _____

Date _____

Telephone _____ Remarks _____

Attachments:

END OF SECTION

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 MINOR CHANGES IN THE WORK

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

1.4 PROPOSAL REQUESTS

A. Engineer-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests (WCPR) issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. If Contractor determines Construction Schedule will require modification, include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. If Contractor determines Construction Schedule will require modification, include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
6. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

1.5 CHANGE ORDER PROCEDURES

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

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Engineer may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. The Contractor shall submit to the Engineer within 14 days after Notice of Award a Schedule of Values. The Schedule shall add up to the full 100% value of the lump sum bid (Bid Item 101), plus any Alternates selected by the Engineer. The primary items of The Schedule should be broken down into the following categories with further breakdowns within those categories. The Schedule shall be used for the purpose of arriving at a basis of partial payments to the Contractor for each construction category

SCHEDULE OF VALUES

Construction Categories and Sub-categories

1. Bonds and Insurance
2. Mobilization
3. Construction Stakeout
4. Soil Erosion, Sediment Control and Tree Protection
5. Site Clearing
6. Existing Asphalt Pavement Removal
7. Existing Concrete (et. Al.) Pavement Removal
8. Selective Demolition
9. Grubbing, Tree and Vegetation Removal
10. Rooting Pruning
11. Topsoil Stripping and Stockpiling
12. Earthwork Excavation and Filling
13. Earthwork Support and Containment

14. Earthwork Dewatering
15. Auger Cast Grout Piles
16. Termite Control
17. Final Grading
18. Chain Link Fences and Gates
19. Ornamental Fences and Gates
20. Sanitary Sewerage Utilities
21. Storm Water Drainage, Filtration, etc.
22. Storm Water Utilities, Inlets
23. Underground Ducts and Utility Structures
24. Water Utilities
25. Cast-in-Place Concrete
26. Unit Masonry
    a. Sub-Grade
    b. Above Grade
27. Historic Masonry Cleaning & Repair
28. Historic Metal Repair
29. Structural steel
30. Steel joists
31. Steel Decking
32. Acoustical Steel Decking
33. Metal Canopies
34. Miscellaneous Metal Fabrications
35. Metal Stairs
36. Pipe and Tube Railings
37. Decorative Metal Railings
38. Cold-Formed Metal Framing
39. Non-Structural Metal Framing
40. Rough Carpentry
41. Finish Carpentry
42. Architectural Casework
43. Pool
    a. General Requirements
    b. Shell Repair
    c. Tiled Finish
    d. Painted Finish
    e. Mechanical
    f. Electrical
    g. Main Drain / Hydrostatic Relief System
    h. Cleaning and Maintenance Equipment
    i. Commissioning, etc.
44. Pool Recreational Equipment
45. Sheet Waterproofing
46. Weather Barriers
47. Thermal insulation
48. Cast Stone Panels
49. Metal Composite Material Wall Panels
50. Rainscreen Attachment System
51. Sheet metal flashing and trim
52. Roof Accessories
53. Roofing
54. Applied Fire Protection
55. Firestopping
56. Joint Sealants and Expansion Joint Assemblies
57. Historic Treatment of Steel Windows

58. Hollow Metal Doors and Frames
59. Flush Wood Doors
60. Access Doors
61. Other Doors
62. Aluminum-Framed Storefronts
63. Curtainwall
64. Glazing
65. Mirrors
66. Skylights
67. Louvers
68. Door Hardware
69. Gypsum Board Assemblies
70. Tiling
71. Acoustical Ceilings
72. Wood Strip Flooring
73. Resilient Flooring
74. Resilient Athletic Flooring
75. Tile Carpeting
76. Wall Coverings
77. Acoustical Wall and Ceiling Units
78. Painting and Coating
79. High Performance Coatings
80. Visual Display Units
81. Signage
82. Traffic Signage
83. Plastic Toilet Compartments
84. Operable Partitions
85. Toilet, Bath, And Laundry Accessories
86. Fire Protection Specialties
87. Lockers
88. Metal Storage Shelving
89. Wall-mounted Standards and Shelving
90. Appliances
91. Projection Screens
92. Gymnasium Equipment
93. Fitness Equipment
94. Office and Lounge Furniture
95. Window Shades
96. Entrance Floor Mats
97. Telescoping Bleachers
98. Playground Equipment
99. Site Furnishings
100. Specialty Acoustical Control Systems
101. Elevator
102. Wet-pipe Sprinkler Systems
103. Domestic Piping/Plumbing
    a. Sleeves, Seals, Escutcheons
    b. Meters and Gauges
    c. Valves
    d. Check Valves
    e. Gate Valves
    f. Hangers and Supports
    g. Insulation

h. Specialties
i. Inline Pumps
j. Water Heaters
k. Commercial Plumbing Fixtures
l. Emergency Plumbing Fixtures

104. Pressure Water Coolers
105. Sanitary Waste and Vent
    a. Piping
    b. Drain
    c. Specialties
106. Storm Drainage
    a. Piping
    b. Specialties
107. Sump Pumps
108. HVAC
    a. Ducting
    b. Metal
    c. Non-Metal
    d. Flexible
    e. Accessories
    f. Vibration Controls
    g. Piping
    h. Insulation
    i. Ducts
    j. Piping
    k. Equipment
    l. Meters and Gauges
    m. Valves
    n. Check Valves
    o. Gate Valves
    p. Specialties
    q. Gravity Ventilators
    r. Power Ventilators
    s. Control Valves
    t. Control Dampers
    u. Pressure Instruments
    v. Temperature Instruments
    w. Hangers & Supports
    x. Testing, Adjusting, and Balancing
109. Hydronic
    a. Piping
    b. Specialties
    c. Pumps
    d. Water Treatment
    e. Air Coils
110. Air Terminal Units
111. Air Devices
112. Fabric Air Distribution Devices

113. Basic Indoor Air Handling Units
114. Split System Air-Conditioners
115. Unit Heaters
    a. Cabinet
    b. Propeller
    c. Wall & Ceiling
116. Refrigerant Piping
117. Natural Gas Piping and Specialties
118. Pool Water Heaters
119. Dehumidification Unit
120. Packaged Variable Air Volume Unit
121. Packaged Rooftop Units
122. Direct Digital Control (DDC) System For Hvac
123. Electrical
    a. Raceways and Boxes
    b. Conduits
    c. Wiring Devices
    d. Hangers and Supports
    e. Switches & Circuit Breakers
    f. Fuses
    g. Variable Frequency Drive
124. Electrical Metering
125. Electrical Panelboards
126. Manual Transfer Switch
127. Portable Generator
128. Grounding and Bonding
129. Lighting
    a. Controls
    b. Panels
    c. Interior Devices
    d. Exterior Devices
130. Low-Voltage Electrical Power Conductors & Transformers
131. Data Cabling
132. Fire-alarm System
133. Security Camera Systems
134. Burglar-Alarm Systems
135. DAS/ECCCS Systems
136. Audio Visual Systems
137. Landscaping
    a. Seeding and Mulching
    b. Plants
    c. Trees
138. Playground Surface Systems
139. Pavement Markings
140. Rigid Paving
141. Unit Paving
142. Overcurrent Protective Device Coordination Study
143. Closeout

a. General
b. As-Builts
c. Facility Manual
d. Commissioning

B. Item #4 shall be subdivided into the costs for incremental installation of sediment control devices as required by the Sequence of Construction indicated on the Drawings. Payment under this break down will be limited to an initial payment of 50 percent of the value for devices installed for each increment of sediment control required for that Sequence of Construction at the first monthly estimate after satisfactory installation. The remaining 50 percent payment of the incremental sediment control devices will be made monthly for the duration those devices are required and properly maintained to the satisfaction of the Engineer.

1.5 SCHEDULE OF VALUES COORDINATION

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's Construction Schedule.

1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with continuation sheets.
b. Submittal schedule.

2. The Schedule shall add up to the full 100% value of the lump sum bid. The Schedule shall be used for the purpose of arriving at a basis of partial payments to the Contractor for each construction category.

3. Engineer reserves the right to require line item breakdowns in the Schedule of Values as required to facilitate accurate payment applications and approvals for the project. Initial Applications for Payment may not be submitted until Engineer has approved the Schedule of Values including any line item breakdowns required.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

a. Project name and location.
b. Name of Engineer.
c. Engineer's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of the Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.

f. Change Orders (numbers) that affect value.
g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

1) Labor.
2) Materials.
3) Equipment.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts where appropriate.

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

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

a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.6 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Engineer.

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

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Engineer and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Engineer, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

    a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Engineer reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Engineer.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (approved if not final).
4. Products list (approved if not final).
5. Schedule of unit prices.

6. Submittal schedule (approved if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Data needed to acquire insurance.

I. Application for Payment at Substantial Completion: After Engineer issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Engineer occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on The Project including, but not limited to, the following:

1. General coordination procedures.
2. Project meetings.
3. RFIs.

1.2 DEFINITIONS

A. RFI: Request for Information. Request from City, Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in 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. Removal of any existing elements and constructions necessary for proper completion of the Work, including but not limited to those explicitly shown on the plans, is part of this contract.
3. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
4. Coordination and provision of any labor and materials required to meet the intent of the drawings and specifications herein, including any labor and materials from trades and suppliers other than the primary component described, are required to be provided by the Contractor as part of this contract.
5. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner/Engineer and separate contractors if 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 to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Engineer's property.

1.5 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Engineer will return without response those RFIs submitted to Engineer by entities other than Prime Contractor.

B. Content of the RFI: Include a detailed, legible description of item(s) needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Engineer
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Clarifying sketches and/or photographs as appropriate.
12. Related specification, submittal, etc., paragraphs, as appropriate.
13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.

14. Contractor's signature.
15. Attachments: Include sketches, descriptions, measurements, photos (include surrounding context), Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
    b. Include a description of attachments, including the number of pages.

C. RFI Forms: AIA Document G716.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow 14 days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be rejected:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Engineer's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt by Engineer of additional information.
3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit a Change Proposal according to Section 01 26 00 "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing, with detailed descriptions, within 10 days of receipt of the RFI response.

E. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Engineer of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Engineer, within three days of the meeting.

B. Preconstruction Conference: Conduct a preconstruction conference before starting construction, at a time convenient to Engineer, but no later than 21 days after execution of the Agreement.

1. Responsibilities and personnel assignments will be reviewed.
2. Attendees: Authorized representatives of Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Lines of communications.
    f. Procedures for processing field decisions and Change Orders.
    g. Procedures for RFIs.
    h. Procedures for testing and inspecting.
    i. Procedures for processing Applications for Payment.
    j. Distribution of the Contract Documents.
    k. Submittal procedures.
    l. Preparation of record documents.
    m. Use of the premise and existing building.
    n. Work restrictions.
    o. Working hours.
    p. Engineer 's occupancy requirements.
    q. Responsibility for temporary facilities and controls.
    r. Procedures for moisture and mold control.
    s. Procedures for disruptions and shutdowns.
    t. Construction waste management and recycling.
    u. Parking availability.
    v. Office, work, and storage areas.
    w. Equipment deliveries and priorities.
    x. First aid.
    y. Security.
    z. Progress cleaning.

4. Minutes: Contractor will record and distribute meeting minutes.

C. Project Closeout Conference: A project closeout conference, at a time convenient to Engineer, but no later than 90 days prior to the scheduled date of Substantial Completion, shall be conducted.

1. Requirements and responsibilities related to Project closeout will be reviewed.
2. Attendees: Authorized representatives of City, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    a. Preparation of record documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Submittal of written warranties.

d. Requirements for preparing operations and maintenance data.
e. Requirements for delivery of material samples, attic stock, and spare parts.
f. Requirements for demonstration and training.
g. Preparation of Contractor's punch list.
h. Procedures for processing Applications for Payment at Substantial Completion and for Final Payment.
i. Submittal procedures.
j. Coordination of separate contracts.
k. City's partial occupancy requirements.
l. Requirements for final inspections/occupancy certification.
m. Demobilization procedures.
n. Installation of furniture, fixtures, and equipment.
o. Removal of temporary facilities and controls.

Minutes: Contractor will record and distribute meeting minutes.

D. Progress Meetings: Conduct progress meetings at minimum Monthly intervals unless otherwise directed by Engineer.

1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: In addition to representatives of Engineer, each contractor, subcontractor, supplier, and 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 meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction 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.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Progress cleaning.
10) Quality and work standards.
11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.

14) Status of proposal requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

c. Minutes: Contractor will record and distribute the meeting minutes to each party present and to parties requiring information.

d. Schedule Updating: Revise construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Field condition reports
5. Special reports.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Event: The starting or ending point of an activity.

C. Major Area: A story of construction, a separate building, or a similar significant construction element.

D. Milestone: A key or critical point in time for reference or measurement.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file, where indicated.
2. PDF electronic file.

B. Preliminary construction schedule.

1. Approval of cost-loaded, startup Construction Schedule will not constitute approval of Schedule of Values for cost-loaded activities.

C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

E. Construction Schedule Updating Reports: Submit with Applications for Payment.

F. Site Condition Reports: Submit at time of discovery of differing conditions.

G. Special Reports: Submit at time of unusual event.

H. Qualification Data: For scheduling consultant.

1.5 COORDINATION

A. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within 15 days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

2.2 REPORTS

A. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.3 SPECIAL REPORTS

A. General: Submit special reports directly to Engineer within three days of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Engineer in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At each meeting or other activity where revisions have been recognized or made, update schedule to reflect actual construction progress and activities. Additionally, issue schedule concurrent with the report of each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Engineer, and separate contractors, testing and inspecting agencies and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a Schedule of Submittals, arranged in chronological order by dates required by Construction Schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate Submittal Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised Submittal Schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Engineer's final release or approval.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Engineer's Digital Data Files: Electronic digital data files of the Contract Drawings may be provided by Engineer at the request of the General Contractor and at the Engineer's approval, for Contractor's use in preparing submittals. Any costs associated with preparing these files will be assumed by the General Contractor.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's acceptance of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 21 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 21 days for review of each resubmittal.Allowing procedure in "Concurrent Consultant Review" Subparagraph below may cause tracking problems for Architect and Construction Manager, if any. Delete if not allowed. See Evaluations.
4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Engineer and to Engineer's consultants, allow 21 days for review of each submittal. Submittal will be returned to Engineer before being returned to Contractor.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Engineer.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Engineer, containing the following information:

    a. Project name.
    b. Date.
    c. Name and address of Engineer.
    d. Name of Construction Manager.
    e. Name of Contractor.
    f. Name of firm or entity that prepared submittal.
    g. Names of subcontractor, manufacturer, and supplier.
    h. Category and type of submittal.
    i. Submittal purpose and description.
    j. Specification Section number and title.
    k. Specification paragraph number or drawing designation and generic name for each of multiple items.
    l. Drawing number and detail references, as appropriate.
    m. Location(s) where product is to be installed, as appropriate.
    n. Related physical samples submitted directly.
    o. Indication of full or partial submittal.
    p. Transmittal number, numbered consecutively.
    q. Submittal and transmittal distribution record.
    r. Other necessary identification.
    s. Remarks.

E. Options: Identify options requiring selection by Engineer.

F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via the selected Construction Project Management platform (this will most likely be BCRPs proprietary platform called *RDMS*) as PDF electronic files.

    a. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Action & Informational Submittals: Distribute copies of each submittal unless otherwise indicated.

3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

    a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each specification section, unless required otherwise by the Engineer.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.
    h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams showing factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.
    d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

   a. Identification of products.
   b. Schedules.
   c. Compliance with specified standards.
   d. Notation of coordination requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
3. Submit Shop Drawings in PDF electronic file.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
   e. Specification paragraph number and generic name of each item.

3. Electronic Transmittal: Provide corresponding electronic PDF submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.

4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Engineer's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.

Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

b. Number of Samples: Submit 2 sets of Samples. Architect will retain 1 Sample set; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.

1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit paired units that show approximate limits of variations.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.
5. Submit product schedule as PDF electronic file.

F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of engineers, and other information specified.

G. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

I. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

J. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

K. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

L. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

M. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

O. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

P. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

Q. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

R. Design Data: 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. Include page numbers.

S. Delegated-Design

1. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   a. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

2. Delegated-Design Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file of certificate, signed and sealed by the responsible design professional registered in the state the project is in, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

a. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

A. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Engineer without action.

END OF SECTION

SECTION 01 42 19

REFERENCE STANDARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Applicability of Reference Standards.

B. Provision of Reference Standards at Site.

C. Acronyms used in Contract Documents for Reference Standards. Source of Reference Standards.

1.2 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. The date of the standard is that in effect as of the Bid Date, or date of Owner-Contractor Agreement when there are no bids, except when a specific date is specified.

C. When required by individual Specification Section, obtain copy of standard. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.

1.3 SCHEDULE OF REFERENCES

AA Aluminum Association
1525 Wilson Blvd.
Arlington, VA 22209
703-358-2960

AABC Associated Air Balance Council
1518 K Street NW, Suite 503
Washington, DC 20005
202-737-0202

AASHTO American Association of State Highway and Transportation Officials
444 North Capitol Street, N.W.
Washington, DC 20001
202-624-5800

ACI American Concrete Institute
Box 19150
Reford Station
Detroit, MI 48219
248-848-3700

ADC Air Diffusion Council
230 North Michigan Avenue
Chicago, IL 60601
847-706-6750

ADA Americans with Disabilities Act
US Dept of Justice
950 Pennsylvania Ave. NW

Washington, DC 20530
800-514-0301

AGC Associated General Contractors of America
2300 Wilson Blvd., Suite 400
Arlington, VA 22201
703-548-3118

AI Asphalt Institute
2696 Research Park Drive
Lexington, KY 40511
859-288-4960

AISC American Institute of Steel Construction
One East Wacker Dr., Suite 700
Chicago, IL 60601
312-670-2400

AMCA Air Movement and Control Association
30 West University Drive
Arlington Heights, IL 60004
847-394-0150

ANSI American National Standards Institute
25 W. 43rd Street, 4th Floor
New York, NY 10036
212-642-4900

APA American Plywood Association
Box 11700
Tacoma, WA 98411
253-620-7400

AHRI Air-Conditioning Heating and Refrigeration Institute
2111 Wilson Blvd., Suite 500
Arlington, VA 22201
703-524-8800

ASHRAE American Society of Heating, Refrigerating and
Air Conditioning Engineers
1791 Tullie Circle, N.E.
Atlanta, GA 30329
404-636-8400

ASME American Society of Mechanical Engineers
3 Park Ave
New York, NY 10016
800-843-2763

ASTM American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19103
610-832-9500

AWWA American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235

800-926-7337

AWPA American Wood-Preservers' Association
P.O. Box 361784
Birmingham, AL 35236
205-733-4077

AWS American Welding Society
550 LeJeune Road
Miami, FL 33135
800-443-9353

COMAR Codes for the State of Maryland
Division of State Documents
16 Francis Street
Annapolis, MD 21401
410-974-2486

CDA Copper Development Association
260 Madison Ave.
New York, NY 10016
212-251-7200

CLFMI Chain Link Fence Manufacturers Institute
10015 Old Columbia Rd, Suite B215
Columbia, MD 21046
301-596-2583

CRSI Concrete Reinforcing Steel Institute
933 Plum Grove Road
Schaumburg, IL 60195
847-517-1209

EJCDC Engineers' Joint Contract Documents Committee
American Consulting Engineers Council
1050 15th Street, N.W.
Washington, DC 20005
202-347-7474

FGMA Flat Glass Marketing Association
3310 Harrison
White Lakes Professional Building
Topeka, KS 6661

FM Factory Mutual
P.O. Box 9102
Norwood, MA 02062
781-440-8000

FS Federal Specification
General Services Administration
Specifications and Consumer Information
Distribution Section (WFSIS)
Washington Navy Yard, Bldg. 197
Washington, DC 20407

GA Gypsum Association
6525 Belcrest Road, Suite 480
Hyattsville, MD 20782

301-277-8686

IEEE Institute of Electrical and Electronics Engineers
3 Park Avenue, 17th Floor
New York, NY 10016
212-419-7900

IBC International Building Code
Latest Editions, as Published by the International Code Council (ICC)
500 New Jersey Avenue, NW, 6th Floor
Washington, DC 20001
888-422-7233

ICC International Code Council
500 New Jersey Avenue, NW, 6th Floor
Washington, DC 20001
888-422-7233

IMIAC International Masonry Industry All-Weather Council
International Masonry Institute
815 15th Street, N.W.
Washington, DC 20005

MDOT Maryland Department of Transportation
Maryland State Highway Administration
P.O. Box 548
Hanover, MD 21076
410-865-1000

MIL Military Specification
Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, PA 19120

ML/SFA Metal Lath/Steel Framing Association
221 North LaSalle Street
Chicago, IL 60601

NAAMM National Association of Architectural Metal Manufacturers
800 Roosevelt Rd., Sldg C, Suite 312
Glen Ellyn, IL 60137
630-942-6591

NEBB National Environmental Balancing Bureau
8575 Grovemont Circle
Gaithersburg, MD 20877
301-977-3698

NEMA National Electrical Manufacturers' Association
1300 N. 17th Street, Suite 1752
Rosslyn, VA 22209
703-841-3200

NFPA National Forest Products Association
1619 Massachusetts Avenue, N.W.
Washington, DC 20036

NSWMA National Solid Wastes Management Association
4301 Connecticut Avenue, N.W., Suite 300
Washington, DC 20008
202-244-4700

NTMA National Terrazzo and Mosaic Association
PO Box 2605
Fredericksburg, TX 778624
800-323-9736

PCA Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077
847-966-6200

PCI Prestressed Concrete Institute
200 W. Adams Street, #2000
Chicago, IL 60606
312-786-0300

PS Product Standard
U.S. Department of Commerce
Washington, DC 20203

SDI Steel Deck Institute
Box 3812
St. Louis, MO 63122
847-458-4647

SDI Steel Door Institute
30200 Detroit Road
Westlake, OH 44145
440-899-0010

SIGMA Sealed Insulating Glass Manufacturers Association
401 N. Michigan Ave., Suite 2400
Chicago, IL 60611
312-644-6610

SJI Steel Joist Institute
1173B London Links Drive
Forest, VA 24551
434-525-7377

SMACNA Sheet Metal and Air Conditioning Contractors' National Association
4201 LaFayette Center Drive
Chantilly, VA 20151
703-803-2980

SSPC Steel Structures Painting Council
40 Twenty-Fourth Street, 6th Floor
Pittsburgh, PA 15222
877-281-7772

TAS Technical Aid Series
Construction Specifications Institute
110 S. Union Street, Suite 100

Alexandria, VA 22314
800-689-2900

TCNA Tile Council of North America, Inc.
100 Clemson Research Blvd.
Anderson, SC 29625
864-646-8453

UL Underwriters' Laboratories, Inc.
333 Pfingston Road
Northbrook, IL 60062
847-272-8800

WCLIB West Coast Lumber Inspection Bureau
Box 23145
Portland, OR 97223
503-639-0651

WSSC Washington Suburban Sanitary Commission
14501 Sweitzer Lane
Laurel, MD 20707
800-828-6439

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

01 45 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Quality assurance and control of installation.

1.2 QUALITY ASSURANCE AND 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. All manufactured articles, materials, equipment, fixtures and accessories shall be handled, stored, applied, installed, connected, erected, used, cleaned and conditioned, as directed by the manufacturers, unless otherwise indicated, specified, or directed by the Architect in writing. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

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 stressed, vibration, physical distortion or disfigurement.

1.3 GENERAL WORKMANSHIP
A. Workmanship shall be neat, thorough, substantial and conform to the following, unless otherwise indicated or specified.

B. Units: Set level, plumb, or true to other lines indicated. Fit neatly and closely together and anchor firmly in place.

C. Surfaces:
1. Level, plumb, true to indicated plane;
2. Smooth, flat;
3. Uniform in color and texture;
4. Clean and neat in appearance.

D. Joints and seams: Conceal where possible, except where otherwise indicated or specified.

E. Joints and seams exposed to view:
1. Neat, straight, tight, flush, smooth, uniform, strong;

2. Plumb, level or otherwise true to line indicated;
3. Located where least conspicuous;
4. Construct to prevent opening;
5. Equally spaced;
6. Obtain Architect's written acceptance of joints and seams exposed to view, except where such exposure is shown or specified.

F. Coursing: Uniform, accurately spaced, modular unless otherwise noted.

G. Corners, straight square, sharp, neat, plumb, level or true to other lines indicated.

H. Anchors, fastenings, connections, accessories:
1. Provide anchors, fastenings, framing, supports, hangers, bracing, brackets, straps, angles, bolts, etc., adequate in size, design and quantity to set and connect work rigidly in place and to safely sustain stresses to which they will normally be subjected.
2. Conceal such work where possible, except where otherwise indicated or specified.
3. Such items exposed to view shall be equally spaced, located where least conspicuous and neat in appearance. Obtain Architect's written acceptance of exposed items except where such exposure is shown or specified.

1.4 REFERENCES

A. Where reference is made to publications, tests, standard specifications, manufacturer's directions, data sheets or other literature unless the date is stated, the latest edition published before date of specifications shall apply.

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

C. 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.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION 01 45 00

SECTION 01 45 29

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Selection and payment.

B. Laboratory responsibilities.

C. Laboratory reports.

D. Limits on testing laboratory authority.

E. Contractor responsibilities.

F. Schedule of inspections and tests.

1.2 REFERENCES

A. ANSI/ASTM D 3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ANSI/ASTM E 329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.3 SELECTION AND PAYMENT

A. Contractor will employ and pay for services of an independent testing laboratory to perform Certified Inspection and Testing Firm (CITF).

B. Employment of testing laboratory (CITF) shall in no way relieve Contractor of obligation to perform work in compliance with requirements of Contract Documents.

1.4 LABORATORY RESPONSIBILITIES

A. Test samples of mixes submitted by Contractor to testing laboratory.

B. Provide qualified personnel at site. Cooperate with Architect/Engineer and Contractor in performance of services.

C. Perform specified inspection, sampling, and testing of products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of Contract Documents.

E. Promptly notify Contractor and Owner of observed irregularities or non-conformance of Work or products.

F. Perform additional inspections and tests required by Architect/Engineer.

G. Attend preconstruction conferences and progress meetings.

1.5 LABORATORY REPORTS

A. After each inspection and test, promptly submit 4 copies of laboratory report to Contractor, with 2 copies each to Architect/Engineer and Owner.

B. Include:

1. Data issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and Specification Section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Compliance with Contract Documents.

C. When requested by Architect/Engineer, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Laboratory may not approve or accept any portion of the Work.

C. Laboratory may not assume any duties of Contractor.

D. Laboratory has no authority to stop the Work unless life-threatening health or safety conditions exist.

1.7 CONTRACTOR RESPONSIBILITIES

A. Deliver to laboratory, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.

B. Cooperate with laboratory personnel, and provide access to the Project.

C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, and to facilitate tests and inspections, storage and curing of test samples.

D. Notify CITF and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF INSPECTIONS AND TESTS

The following list is not meant to be all inclusive.

A. Mortar: Requirements for sampling and testing mortar cubes.

B. Cast-In-Place Concrete: Certificate from plant / slump test of PSI rating.

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.2 USE CAHRGES, AND USE BY OTHER ENTITIES

A. General: Installation and removal of, and use charges for, temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Engineer's construction forces, Engineer, occupants of Project, testing agencies, and authorities having jurisdiction.

1.3 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Project Identification and Temporary Signs: Submit fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

C. Moisture-and Mold-Protection Plan: Indicate procedures and controls for protecting existing context, materials, and construction from water absorption and damage and mold.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Engineer's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units, with serviceable finishes, temperature controls, and foundations adequate for normal loading, will be allowed if of a size acceptable to the Engineer.

B. Construction Meetings: Meetings may be held on-site in the Field Office

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance, also see Section 01 10 00 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Engineer, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from

adverse environmental effects including low temperatures and high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.

E. Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Install electric power service unless otherwise indicated.

F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, safety, and traffic conditions.

G. Telephone Service: If construction site office is not provided with land-line telephone and internet service, the General Contractor's superintendent shall at a minimum carry a cell phone and have direct access to email.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
1. Maintain support facilities until Engineer schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Engineer.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction including required coordination and permitting

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated in Division 1 and Documents.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touch up signs so they are legible at all times.

D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck, cranes, and similar devices used only for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from Engineer and adjacent property Owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways.

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
2. Inspect, repair, and maintain erosion-control and sedimentation-control measures during construction until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

G. Site Enclosure Fence: Prior to commencing work, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion, as shown in the Drawings, and as determined sufficient to accommodate construction operations.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Engineer.

H. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

J. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.

1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
3. Indicate methods to be used to avoid trapping water in finished work.

B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.

3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard and replace stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Daily construction cleanup:
   1. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

C. Maintenance: Maintain facilities in good operating condition until removal.

   1. 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.

D. Temporary Facility Changeover: Do not change over from using temporary facilities to permanent facilities until Substantial Completion or as otherwise indicated in the contract unless explicit permission is given by the Engineer in writing in advance.

E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been 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 temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

   1. Materials and facilities that constitute temporary facilities are property of Contractor. Engineer reserves right to take possession of Project identification signs.
   2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within 21 days of receipt of request, or 7 business days of receipt of additional information or documentation, whichever is later.

    a. Form of Approval: As specified in Section 01 33 00 "Submittal Procedures."
    b. Use product specified if Engineer does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions including temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Engineer.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.

C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Engineer reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Engineer will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Refer to Section 018113.33 Sustainable Design Requirements for additional product requirements.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:

    a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
    b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
    c. Products specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not named.

4. Manufacturers:

    a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.

b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Engineer's sample", provide a product that complies with requirements and matches Engineer's sample. Engineer's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Engineer from manufacturer's full range" or similar phrase, select a product that complies with requirements. Engineer will select color, gloss, pattern, density, or texture from manufacturer's product line.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Submit Request for Substitution for consideration. Limit each request to one proposed substitution.
3. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence.
4. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
5. Evidence that proposed product provides specified warranty.
6. List of similar installations for completed projects with project names and addresses and names and addresses of engineers, if requested.
7. Samples, if requested.
8. The Architect will make notification in writing, of decision to accept or reject request.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 66 00

PRODUCT STORAGE & HANDLING REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Packaging and Transportation.

B. Delivery and Receiving

C. Product Handling

D. Storage, General

E. Enclosed Storage

F. Exterior Storage

G. Maintenance of Storage

H. Protection of Finished Work

I. Repair and Replacement

PART 2 – PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 TRANSPORTATION AND HANDLING

A. Packaging and Transportation

1. Require supplier to package finished products in boxes or crates for protection during shipment, handling, and storage. Protect sensitive products against exposure to elements and moisture.
2. Protect sensitive equipment and finishes against impact, abrasion, and other damage.

B. Delivery and Receiving

1. Arrange deliveries of products in accordance with construction progress schedules. Allow time for inspection prior to installation.
2. Coordinate deliveries to avoid conflict with Work and conditions at site; limitations on storage space; availability of personnel and handling equipment; and Owner's use of premises.
3. Deliver products in undamaged, dry condition, in original unopened containers or packaging with identifying labels intact and legible.
4. Clearly mark partial deliveries of component parts of equipment to identify equipment and contents, to permit easy accumulation of parts, and to facilitate assembly.
5. Immediately upon delivery, inspect shipment to assure:
   a. Product complies with requirement of Contract Documents and reviewed submittals.
   b. Quantities are correct.
   c. Accessories and installation hardware are correct.
   d. Containers and packages are intact and labels legible.
   e. Products are protected and undamaged.

C. Product Handling

1. Provide equipment and personnel to handle products, by methods to prevent soiling and damage.
2. Provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.
3. Handle product by methods to avoid bending or overstressing. Lift large and heavy components only at designated lift points.

3.2 STORAGE AND PROTECTION

A. General
1. Store products immediately upon delivery in accordance with manufacturer's instructions, with seals and labels intact. Protect until installed.
2. Arrange storage in a manner to provide access for maintenance of stored items and for inspection.
3. Stored materials must not conflict with work conditions. On-site storage methods and locations subject to Owner's approval.

B. Enclosed Storage
1. Store products subject to damage by the elements in substantial weathertight enclosures.
2. Maintain temperature and humidity within ranges stated in manufacturer's instructions.
3. Provide humidity control and ventilation for sensitive products as required by manufacturer's instructions.
4. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.

C. Exterior Storage
1. Provide substantial platforms, blocking, or skids, to support fabricated products above ground; slope to provide drainage. Protect products form soiling and staining.
2. For products subject to discoloration or deterioration from exposure to the elements, cover with impervious sheet material. Provide ventilation to avoid condensation.
3. Store loose granular materials on clean, solid surfaces such as pavement, or on rigid sheet materials, to prevent mixing with foreign matter.
4. Provide surface drainage to prevent erosion and ponding of water.
5. Prevent mixing of refuse or chemically injurious materials or liquids.

D. Maintenance of Storage
1. Periodically inspect stored products on a scheduled basis.
2. Verify that storage facilities comply with manufacturer's product storage requirements.
3. Verify that manufacturer-required environmental conditions are maintained continually.
4. Verify that surfaces of products exposed to the elements are not adversely affected and that any weathering of finishes is acceptable under requirements of Contract Documents.

E. Maintenance of Equipment Storage
1. For mechanical and electrical equipment in long-term storage, provide manufacturer's service instructions to accompany each item, with notice of enclosed instructions shown on exterior of package.
2. Service equipment on a regularly scheduled basis, maintaining a log of services; submit as a Record Document.

F. Storage of Owner's Salvaged Furnishings and Equipment
Contractor shall provide temporary storage facilities for items to be salvaged and re-installed.

3.3 PROTECTION OF FINISHED WORK

A. Protect finished surfaces, including jambs and soffits of openings used as passageways,

through which equipment and materials are handled.

B. Protect finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.

C. Keep finished surfaces clean, unmarred, and suitably protected until accepted by owner.

3.4 REPAIRS AND REPLACEMENTS

A. In event of damage, promptly make replacements and repairs at no additional cost to Owner.

B. Additional time required to secure replacements and to make repairs will not justify an extension in Contract Time of Completion, unless Owner authorizes such extension.

END OF SECTION

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Installation of the Work.
3. Coordinating installations.
4. Cutting and patching.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work

B. Related Requirements:

1. Section 01 10 00 "Summary" for limits on use of Project site.
2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Engineer-accepted deviations from indicated lines and levels, and final cleaning.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.

C. Cutting and Patching Plan: Submit plan describing procedures at least 8 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

    a. Include description of provisions for temporary services and systems during interruption of permanent services and systems. See 01 50 00.

1.5 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Engineer of locations and details of cutting and await directions from Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

    a. Primary operational systems and equipment.
    b. Fire separation assemblies.
    c. Air or smoke barriers.
    d. Thermal barriers and insulation.
    e. Fire-suppression systems.
    f. Mechanical systems piping and ducts.
    g. Control systems.
    h. Communication systems.
    i. Fire-detection and -alarm systems.
    j. Conveying systems.
    k. Electrical wiring systems.
    l. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

    a. Water, moisture, or vapor barriers.
    b. Exterior envelope.
    c. Membranes and flashings.
    d. Exterior curtain-wall construction.

e. Sprayed fire-resistive material.
f. Equipment supports.
g. Piping, ductwork, vessels, and equipment.
h. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Cutting and Patching Conference: If requested by Engineer, before proceeding, meet at Project site with all parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

C. Remove and replace per code any existing items, components, products, and finishes required to complete execution of the specified elements of the Contract per code and per manufacturer's requirements.

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot, or should not, be used, use materials that, when installed, will provide a match acceptable to Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
3. Refer to the Environmental Management Plan attached to section 312300.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Engineer that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a Request for Information to Engineer according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.

B. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

C. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer and Construction Manager.

3.4 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
4. Attach/Install all project components, at a minimum, per manufacturer's requirements.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 "Construction Waste Management and Disposal."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

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

3.6 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 001 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: This Section establishes general requirements pertaining to cutting, fitting, and patching of Work required to:

1. Make the several parts fit properly.
2. Remove and/or uncover existing finishes or structures to provide for installation or inspection of new work.
3. Patch existing finishes and structures in connection with new work.
4. Remove and replace work not conforming to requirements of Contract Documents.
5. Remove and replace defective work.

B. Related work:

1. In addition to other requirements specified, upon Architect's request uncover work to provide for Architect's inspection of covered work, and remove samples of installed materials for testing.
2. Do not cut or alter work performed under separate contracts without Architect's written permission.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in necessary crafts and who are completely familiar with specified requirements and methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Request for Architect's consent:

1. Prior to cutting that affects structural safety, submit written request to Architect for permission to proceed with cutting.
2. Should conditions of Work or schedule indicate required change of materials or methods for cutting and patching, notify Architect and secure the Architect's written permission.

B. Notice to Architect

1. Submit written notice to Architect designating time Work will be uncovered, to provide for Architect's observation.

1.4 PAYMENT OF COSTS

A. Perform cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications. If not identified in other sections of these specifications, provide material to match adjacent construction.

PART 3 - EXECUTION

3.1 CUTTING AND PATCHING

A. General
1. Where cutting of any structural member is required and such cutting is not indicated or specified, first obtain Architect's written acceptance for each location. Also obtain written approval from local building officials, if required by local building code.
2. Contractor shall locate and arrange for cutting of openings and chases through walls, floors, and ceilings in advance of need. Avoid unnecessary or excessive cutting. Where cutting of finished surface is required, make cuts neatly along true lines to avoid need for patching. Where possible, make holes and other cuts so they will be concealed by finished work and where they will be least conspicuous. Work in place damaged or defaced by cutting shall be restored to original conditions so such damage or defacement is undetectable upon completion.
3. Do not cut and patch structural work in a manner resulting in reduction of load carrying capacity or load/deflection ratio. Do not cut and patch operational elements and safety related components in a manner resulting in decreased operational life, increased maintenance, or decreased safety. Do not cut and patch work which is exposed on the exterior or exposed in occupied spaces of the building, in a manner resulting in reduction of visual qualities or resulting in substantial evidence of cut and patch work, both as judged solely by the Architect. Remove and replace work judged by the Architect to be cut and patched in a visually unsatisfactory or otherwise objectionable manner.
4. Where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work.
5. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
6. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.
7. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coats.

B. Materials:
Except as otherwise indicated or approved by the Architect, provide materials for cutting and patching which will result in equal or better work than work being cut and patched; in terms of performance characteristics and including visual effect where applicable. Use materials identical with original materials where feasible and where recognized that satisfactory results can be produced thereby.

C. Scope of Cutting and Patching Work:
The Contractor shall perform all cutting and patching required and necessary to accomplish the construction of all improvements described in the Contract Documents, at no additional cost to the Owner.

3.2 TEMPORARY SUPPORT AND PROTECTION
A. Provide adequate temporary support for work to be cut, to prevent failure. Do not endanger other work. Provide adequate protection of other work during cutting and patching, to prevent damage; and provide protection of the work from adverse weather exposure.

3.3 SURFACE CONDITIONS
A. Inspection:
1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
2. After uncovering work, inspect conditions affecting installation of new work.

B. Discrepancies:

1. If uncovered conditions are not as anticipated, immediately notify Architect and secure needed directions.
2. Do not proceed until unsatisfactory conditions are corrected.

END OF SECTION

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Throughout construction period, maintain buildings and site in standard of cleanliness as described in this Section.

B. Related work:

1. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.

B. In addition to standards described in this Section, comply with pertinent requirements and standards.

1.3 SAFETY REQUIREMENTS

A. Standards: Maintain project in accord with safety and insurance requirements and standards.

B. Hazard Control: Store volatile wastes in covered metal containers and remove from premises daily. Prevent accumulation of waste that creates hazardous conditions. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws. Do not burn or bury rubbish and waste materials on project site. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains. Do not dispose of wastes into streams or waterways.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

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

2.2 COMPATIBILITY

A. Use only cleaning materials and equipment compatible with surface being cleaned, as manufacturer of material recommends.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General:

1. Retain stored items in orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
3. At least twice each month, and more often if necessary, completely remove all scrap,

debris, and waste material from job site.

4. Provide adequate storage for all items awaiting removal from job site, observing requirements for fire prevention and protection of ecology.

B. Site:
1. Daily, and more often if necessary, inspect site and pick up all scrap, debris, and waste material. Remove such items to place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on site. Restack, tidy, or otherwise arrange to meet requirements of subparagraph 3.1-A-1 above.
3. Maintain site in neat and orderly condition at all times.
4. At reasonable intervals during progress of work, clean site and public properties, and dispose of waste materials, debris and rubbish. Clean mud, dirt, and debris resulting from building operation from drives, roads, and lots as required, and maintain access roads to site in good condition.
5. Provide on-site dumpster containers for collecting waste materials, debris, and rubbish. Remove snow and ice from public walkways and public access of buildings.

C. Structures:
1. Weekly, and more often if necessary, inspect structures and pick up all scrap, debris, and waste material. Remove such item to place designated for their storage.
2. Weekly, and more often if necessary, sweep interior spaces clean.
   a. "Clean," for purpose of this subparagraph, is interpreted as meaning free from dust and other material capable of being removed by reasonable effort and hand-held broom.
3. As required to prepare for installing succeeding materials, clean structures or pertinent portions thereof to degree of cleanliness recommended by manufacturer of succeeding material, using equipment and materials required to achieve necessary cleanliness.
4. Following installation of finish floor materials, protect and keep floor clean
5. Or clean daily while work is being performed in pace in which finish materials are installed.
   a. "Clean," for purpose of this subparagraph, is interpreted as meaning free from foreign material which, in Architect's opinion, may be injure finish floor material.

3.2 FINAL CLEANING

A. "Clean," for purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning level of cleanliness generally provided by skilled cleaners using commercial-quality building maintenance equipment and materials.

B. Prior to completing Work, remove from job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.

C. Site:
1. Unless Architect specifically directs otherwise, broom clean paved areas on site and public paved areas adjacent to site.
2. Completely remove resulting debris.

D. Structures - Clean to remove debris and dirt caused by Work of Contract:
1. Exterior:
   a. Visually inspect exterior of surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
   b. Remove all traces of splashed materials from adjacent surfaces.
   c. If necessary to achieve uniform degree of cleanliness, hose down exterior of structure.

d. In event of stubborn stains not removable with water, Architect may require light pressure washing or other cleaning at no additional cost to Owner.

2. Interior:
   a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
   b. Remove all traces of splashed material from adjacent surfaces.
   c. Remove paint droppings, spots, stains, and dirt from finished surfaces.
3. Glass: Clean inside and outside.
4. Polished surfaces: To surfaces requiring routine application of buffed polish, apply polish recommended by manufacturer of material being polished.

E. Inspection and Schedule:
   1. In preparation for substantial completion or occupancy, conduct final inspection of exposed interior and exterior surfaces and of concealed spaces.
   2. Schedule final cleaning as approved by Architect to enable Owner to accept completely clean Work.

F. If Contractor fails to clean up at completion of work, Owner may do so and charge cost to Contractor.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

1.2 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

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

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a *List of Incomplete Items* (to be completed and corrected) A.K.A. *Contractor's punch list*), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 14 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Engineer unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number where applicable.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Engineer's signature for receipt of submittals.

5. Submit test records.
6. Submit changeover information related to Engineer 's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 14 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Engineer of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Engineer. Advise Engineer's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Engineer's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
6. Advise Engineer of changeover in heat and other utilities.
7. Participate with Engineer in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 14 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 01 29 00 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (CONTRACTOR'S PUNCH LIST)

A. Organization of List: 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.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding to indoor spaces.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Engineer.
    d. Name of Contractor.
    e. Page number.

4. Submit *List of Incomplete Items* in digital format.

5. The absence of items on the punch list and/or failure of engineer to identify items not included on the list shall in no way relieve contractor from completing the Work in the Documents.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Engineer 's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 21 days of completion of designated portions of the Work that are completed and occupied or used by Engineer during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) 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.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 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

3.1 FINAL CLEANING

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

B. 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 certification of Substantial Completion for entire Project or for a designated 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. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. 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.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
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 ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
q. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, etc.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

   a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

SECTION 01 78 23 – OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory manuals.
2. Systems and equipment operation manuals.
3. Systems and equipment maintenance manuals.
4. Product maintenance manuals.

1.2 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Engineer will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Engineer.

   a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
   b. Enable inserted reviewer comments on draft submittals.

2. Operations manual: Include a complete operation and maintenance directory. For printed version enclose title pages and directories in clear plastic sleeves.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Engineer and Commissioning Authority will review and comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Engineer will return copy with comments.

1. Correct or revise each manual to comply with Engineer's comments. Submit copies of each corrected manual within 14 days of receipt of Engineer's comments and prior to commencing demonstration and training.

1.4 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Engineer.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Engineer.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Engineer that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

PART 2 - PRODUCTS

2.1 EMERGENCY MANUALS

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Engineer's operating personnel for types of emergencies indicated.

B. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Water leak.
4. Power failure.
5. Water outage.
6. System, subsystem, or equipment failure.

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Engineer 's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.2 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.

6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed and identify color coding where required for identification.

2.3 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds, as described below.

C. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

    a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

H. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

2.4 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference

Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 78 36

WARRANTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Preparation and submittal of warranties.

B. Schedule of submittals.

1.2 FORM OF SUBMITTALS

A. Bind in commercial quality 8-1/2-inch by 11-inch, three-ring "D" type ring binders, with hardback, cleanable plastic covers; 3-inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings and provide table of contents in each binder.

B. Label cover of each binder with typed or machine printed title WARRANTIES with title of Project, Project number, name, address, and telephone number of Contractor; and name of responsible principal.

C. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual; with each item identified with the number and title of the Specification Section in which specified, and the name of Product or Work item.

D. Separate each warranty with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List sub-contractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

1.3 PREPARATION OF SUBMITTALS

A. General: Verify with other specifications Sections for required warranties.

B. Obtain warranties, executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of Work. Except for items placed into service with Owner's permission, leave date for beginning of warranty time blank until the Date of Substantial Completion is accepted by the Architect and other.

C. Verify that documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals, when required. Provide originals for each Project Building. Photostatic copies are not acceptable.

E. Retain warranties until time specified for submittal.

1.4 TIME OF SUBMITTALS

A. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.

B. For items of Work when acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous Record Submittals.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit 1 set of marked-up record prints.
2. Number of Copies: Submit copies of record Drawings as follows:

    a. Initial Submittal:

        1) Submit 1 paper-copy set of marked-up record prints.
        2) Submit PDF electronic files of scanned record prints and file prints.
        3) Submit record digital data files and 1 set of plots.
        4) Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

    b. Final Submittal:

        1) Submit 1 paper-copy set of marked-up record prints.
        2) Submit PDF electronic files of scanned record prints.
        3) Include each drawing, whether or not changes and additional information were recorded.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

E. Reports: Submit into Construction Management Platform (*RDMS*) written report biweekly indicating items incorporated into project record documents concurrent with progress of

the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS andSPECIFICATIONS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, as well as Specifications Book, incorporating new and revised drawings and specifications as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an acceptable drawing technique.
    c. Record data as soon as possible after obtaining it.
    d. Record and check the markup before enclosing concealed installations.
    e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Duct size and routing.
    i. Locations of concealed internal utilities.
    j. Changes made by Change Order or Construction Change Directive.
    k. Changes made following Engineer's written orders.
    l. Details not on the original Contract Drawings.
    m. Field records for variable and concealed conditions.
    n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings, Shop Drawings, and Specifications completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets (including Specifications) with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings, including Specifications.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2.2 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.3 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

END OF SECTION

SECTION 01 78 46

EXTRA STOCK MATERIALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Products required.

B. Storage and delivery of products.

1.2 PRODUCTS REQUIRED

A. Provide quantities of products, spare parts, maintenance tools, and maintenance materials specified in other Sections to be furnished to Owner, in addition to requirements for completion of Work.

B. Products: Identical to those installed in the Work. Include quantities in original purchase from supplier to avoid variations in manufacture.

1.3 STORAGE AND MAINTENANCE

A. Store products with products to be installed in the Work.

B. After delivery of products to site, maintain spare products in same space and condition as products to be installed in the Work.

1.4 DELIVERY

A. Coordinate with Owner: Deliver itemized products and unload spare products to Owner at Project site or where directed by Owner and obtain receipt prior to Final Payment Submittal.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes: Labor, equipment, materials, and accessories necessary for and reasonably incidental to completion of selective demolition and removals as shown on Drawings and as herein specified.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled work men who are thoroughly trained and experienced in necessary crafts and who are completely familiar with specified requirements and methods needed for proper performance of work.

B. Comply with standards specified and as required by all agencies having jurisdiction.

PART 2 - PRODUCTS

(No products are required in this Section)

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work prior to commencing Work. Do not proceed until unsatisfactory conditions are corrected.

B. Contractor shall accept site and buildings thereon and contents thereof in condition in which they may be when released to him or her. Any hazardous materials that might be discovered shall be responsibility of Contractor to have removed from site.

3.2 PROTECTION

A. Proper precaution shall be taken at all times to protect vehicular and pedestrian traffic from any damage or injury which may be caused, either directly or indirectly by Work of this Section. Do not obstruct traffic.

B. Demolition will take place around occupied buildings. A method for control and scheduling of loud noises shall be developed and followed to assure minimum inconvenience. Protect improvements on adjoining properties as well as those on Owner's property.

3.3 SALVAGE AND RE-USE OF EXISTING CONSTRUCTION

A. If required, temporarily remove and reinstall existing items of construction scheduled to remain.

B. Carefully remove, tag, protect, and store existing materials and components scheduled or proposed for re-use. Obtain Architect's written approval of each component or batch of materials before such re-use is executed.

3.4 DEMOLITION

A. Remove existing construction as indicated on Drawings and as required to accommodate alterations and new construction indicated on Drawings.

B. Provide planking, bridges, fences, bracing, shoring, barriers, warning signs, and lights as required to afford protection specified herein. Post easily readable warning signs in

adequate number, conspicuously around all hazardous areas. Make periodic inventory of protective devices to insure continuous protection.

C. Shoring and bracing: When removing any structural supports, install shoring, struts, bracing, and other protection as required to prevent collapse of walls, floors or framing and to maintain safety for workmen and public. Use of salvaged material for shoring or bracing will not be permitted.

D. Execute work in quiet, careful, and orderly manner, with least possible disturbances. Perform demolition work in such manner as to avoid hazard to persons and property. Demolish masonry and concrete in small sections. Remove individually, and carefully lower structural members.

E. Exercise care when separating parts to be removed from those to remain, so that minimum of restoration will be required. Where cutting of finished surfaces is indicated, or required, make cuts neatly along true lines.

F. Exercise care when removing materials and equipment scheduled or proposed for re-use or to be retained by Owner and protect against damage or loss. Equipment and materials should be removed by trade involved.

G. Provide any patching and repairs required.

H. Regularly remove debris and refuse and legally dispose of it off site. Do not burn any material or debris on site.

3.5 REPLACEMENTS

A. All construction to remain, which is damaged by demolition and removal operations under this Section, shall be restored and repaired to Architect's satisfaction at no additional cost to Owner. Where voids are created by removals or cutting, fill and repair such voids as required to provide sound, complete continuous surfaces.

B. Should any public or private property be disturbed or damaged as result of Contractor's operation, he shall at his own cost and expense, restore such property to condition equivalent to that which existed before damage was done, to Architect's satisfaction.

3.6 DISPOSAL

A. Except for materials and equipment scheduled for re-use or to be salvaged for Owner, assume ownership of all materials and equipment demolished and/or removed and legally dispose of same off-site.

END OF SECTION

SECTION 03 10 30

CONCRETE REPAIRS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall furnish all materials, labor, equipment, tools, etc., required for the repair, renovation, and replacement of concrete as indicated on the Drawings, specified herein, and determined by field survey.

B. The Contractor, in conjunction with the Engineer, shall determine the extent of cracked or deteriorated concrete to be rehabilitated and/or resurfaced. A summary of the work to be performed shall be submitted to the Engineer for review, and such summary shall be approved by the Engineer prior to commencement of the Work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Division 1 - General Requirements

B. Division 3 – Cast-in-Pace Concrete

1.3 SUBCONTRACTOR/APPLICATOR QUALIFICATIONS

A. The Contractor shall furnish the name of all subcontractors/applicators which he proposes to use for this work, including necessary evidence and/or experience records to ascertain their qualifications in the application of epoxy, urethane, and polymer-modified mortars and grouts. Approved applicator qualifications shall include:

B. A minimum of 5 years experience in applying epoxy, urethane, and polymer-modified and cement-based compounds similar to those specified in this Section.

C. A letter from the manufacturer of the specified materials, on the manufacturer's letterhead, signed by an officer of the company, stating that the subcontractor/applicator has been trained in the proper techniques for applying the product, including surface preparation and mixing, placing, curing, and caring for the manufacturer's products. This letter shall further state that the subcontractor/applicator is on the manufacturer's approved list of contractors.

1.4 SUBMITTALS

A. Material certifications and technical data sheets on all grouts, mortars, epoxy resins, aggregates and repair products specified in this Section.

B. Subcontractor/Applicator qualifications as specified in Section 1.3.

C. The Contractor, based on their experience in their profession, may submit to the Engineer for approval, alternative materials and/or methods of work to assure the durability and watertight integrity of the repair work performed.

1.5 ADDITIONAL GUARANTEE

A. The Contractor shall guarantee all repair work performed under this Contract against defects in workmanship resulting in leakage and/or failure of concrete bond for a period of two years from the date of the Certificate of Substantial Completion.

PART 2 -- MATERIALS

2.1 WATER

A. The water used for mixing concrete repair products shall be clear, potable, and free of deleterious substances.

2.2 AGGREGATE

A. All aggregate shall conform to ASTM C-33. The aggregate supplier shall submit to the Engineer documentation that the proposed aggregates comply with ASTM C-33 and the requirements listed below:

B. Pea Gravel - Pea gravel shall meet the gradation and material requirements of Standard Size 14 as defined by ASTM C-33. Pea gravel shall be clean and free from deleterious matter and shall contain no limestone.

2.3 EPOXY BONDING AGENT

A. An epoxy bonding agent shall be used when applying fresh concrete to previously placed concrete. Epoxy bonding agent shall conform to ASTM C-881 Type I, II, IV or V; Grade 2 for epoxy resin adhesives, depending on the application. The class of epoxy bonding agent shall be suitable for all ambient and substrate temperatures. The epoxy adhesive shall be "Sikadur 32 Hi-Mod Series" as manufactured by the Sika Corp, Lyndhurst, NJ, "CR 246" as manufactured by Sto Corporation, Atlanta, GA, "Duralbond" as manufactured by Euclid Chemical Company, Cleveland, OH, "Euco #452 Series" by the Euclid Chemical Company, or "MasterEmaco ADH series" by BASF Master Builder Solutions.

2.4 ANTI-CORROSION REBAR COATING

A. All reinforcing steel cut or exposed during demolition and/or repair operations shall be protected with an anti-corrosive coating. The anti-corrosive coating shall be a two-component, polymer-modified cementitious material such as "Sika Armatec 110 EpoCem " manufactured by Sika Corp., Lyndhurst, NJ, "CR 246" manufactured by Sto Corporation, Atlanta, GA, "Duralprep A.C." by the Euclid Chemical Company, or "MasterEmaco P 124" by BASF Master Builder Solutions.

2.5 CEMENTITIOUS CRACK REPAIR MATERIAL

A. Cementitious crack repair material shall be a two-component, polymer-modified or silica fume enhanced cementitious mortar. Cementitious crack repair material shall be "Sikatop 123 Plus" manufactured by Sika Corp., Lyndhurst, NJ, or "Emaco S88 CI" or "MasterSeal 590" by BASF Master Builder Solutions.

2.6 EPOXY CRACK REPAIR MATERIAL

A. Epoxy crack repair material shall be a two-component, 100% solids, high-modulus, low viscosity epoxy adhesive designed for structural repair. The epoxy adhesive shall be "Sikadur 52" manufactured by Sika Corp., Lyndhurst, NJ, "Duralcrete LV" manufactured by Euclid Chemical Company, Cleveland, OH, "Sto Poxy Binder CR633" manufactured by Sto Corporation, Atlanta, GA, "Eucopoxy Injection Resin" by the Euclid Chemical Company, or "MasterInject 1500" by BASF Master Builder Solutions.

2.7 SPALL REPAIR PATCHING MATERIAL

A. All spall repairs not requiring formwork shall be repaired using a two-component, polymer-modified non-shrink cementitious mortar and shall have a minimum 28-day compressive strength of 7,000 psi. Spall repair mortar for use in horizontal applications shall be "Sikatop 122 Plus" manufactured by Sika Corp., Lyndhurst, NJ, "CR 700" manufactured by Sto Corporation, Atlanta, GA, "Eucocrete Supreme" by the Euclid Chemical Company, or MBT SD-2 or Emaco R310 by BASF Construction Chemicals. Spall repair mortar for use in vertical and overhead applications shall be "Sikatop 123 Plus" manufactured by Sika Corp., Lyndhurst, NJ, "Duraltop Gel" manufactured by Euclid Chemical Company, "CR 702" manufactured by Sto Concrete Restoration Division, Atlanta, GA, "Verticoat or Verticoat Supreme" by the Euclid Chemical Company, or "MasterEmaco N 425" or "MasterEmaco N 400" by BASF Master Builder Solutions.

B. All spall repairs requiring formwork shall be repaired using a two-component, polymer-modified cementitious mortar/pea gravel mixture and shall have a minimum 28-day compressive strength of 7,000 psi. Spall repair mortar shall be "SikaTop 111 PLUS" manufactured by Sika Corp., Lyndhurst, NJ, "Eucocrete Supreme" manufactured by Euclid Chemical Company, Cleveland, OH, "Sto Flowable Mortar CR730" manufactured by Sto Corporation, Atlanta, GA, or "MasterEmaco T 310 CI" by BASF Master Builder Solutions.

2.8 STORAGE OF MATERIALS

A. The Contractor shall provide an area for repair material storage free from exposure to moisture in any form, before, during, and after delivery to the site. Manufactured materials shall be delivered in unbroken containers labeled with the manufacturer's name and product type. All mortar products shall be stored on raised platforms. Materials susceptible to damage by freezing shall be stored in a dry, heated, insulated area. Any material that has hardened, partially set, become caked and/or has been contaminated or deteriorated shall be rejected. All aggregates shall be stored in clean bins, scows or platforms.

PART 3 -- INSTALLATION

3.1 GENERAL REQUIREMENTS

A. No repair work shall be undertaken when ambient temperatures are below manufacturer's safe recommendations. No admixtures, except those required by the manufacturer, shall be used in the repairs specified herein. All products shall be applied in strict accordance with manufacturer's recommendations.

B. All surfaces shall be clean, free of dirt, grease, loose particles, and deleterious substances and shall be prepared according to manufacturer's requirements.

3.2 EPOXY BONDING AGENT

A. Existing concrete surfaces shall be roughened prior to application of bonding agent. Concrete surface shall be clean and sound, free of all foreign particles and laitance. Repair material shall be placed while bonding agent is still tacky. If bonding agent cures prior to placement of repair material, bonding agent shall be reapplied.

B. Repairing concrete with epoxy mortars shall conform to all the requirements of ACI 503.4 "Standard Specification for Repairing Concrete with Epoxy Mortars" (latest edition), except as modified herein.

3.3 ANTI-CORROSION REBAR COATING

A. Reinforcing steel cut or exposed during demolition and/or repair operations shall be sandblasted and cleaned prior to coating with an anti-corrosive coating. Anti-corrosive coating shall be applied as soon as the reinforcement is exposed and cleaned. Coating shall thoroughly cover all exposed parts of the steel and shall be applied according to manufacturer's recommendations.

3.4 CEMENTITIOUS CRACK REPAIR MATERIAL

A. Where indicated on the Drawings, all existing cracks 1/16" and wider shall be repaired with a cementitious crack repair material. Rout crack to 3/4" wide by 3/4" deep V-notch (or as recommended by manufacturer) to expose sound concrete. Where rebar has deteriorated, crack shall be routed to expose 3/4" all around rebar. The resulting void in concrete shall be patched flush with the existing concrete surface using cementitious crack repair material.

3.5 EPOXY CRACK REPAIR MATERIAL

A. Where indicated on the Drawings, all existing structural cracks 1/4" or smaller shall be repaired by pressure injecting an epoxy crack repair binder into the prepared crack. Seal crack surface and install injection ports per manufacturer's recommendations. Holes drilled for injection ports shall not cut rebar. If rebar is encountered during drilling, the hole shall be abandoned and relocated, and the abandoned hole shall be patched immediately with non-shrink grout flush with the surface of the existing concrete. Once the surface sealing material has cured, inject crack with epoxy crack repair binder using standard pressure injection equipment as directed by the manufacturer.

B. Where indicated on the Drawings, all existing structural cracks wider than 1/4" shall be repaired by gravity feeding an epoxy crack repair binder into the prepared crack. First rout the concrete surface to form a 1/4" wide by 1/4" deep v-notch and clean the crack to remove all loose and foreign particles. Fill the crack with clean, dry sand and then pour epoxy crack repair binder into V-notch, completely filling crack. As binder penetrates into crack, additional binder shall be applied to the V-notch.

3.6 SPALL REPAIR PATCHING MATERIAL

A. All voids or spalled areas to be repaired shall be chipped back to sound concrete a minimum 1/8" deep, cleaned and repaired with spall repair patching material according to manufacturer's recommendations. All patching shall provide a final finished surface which is flat, level and even with the existing concrete surface. Repair mortar shall not be feathered to meet existing concrete surface. Final patching on horizontal surfaces shall receive a broom finish consistent with the finish on the existing structure.

3.7 CURING

A. All repair products shall be cured in strict accordance with manufacturer recommendations.

END OF SECTION 03 01 30

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Miscellaneous Concrete

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

   1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Material Certificates: For each of the following, signed by manufacturers:

   1. Cementitious materials.
   2. Admixtures.
   3. Aggregates.
   4. Curing compounds.
   5. Bonding agents.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

C. Codes and Standards: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I or II.
2. Fly Ash: ASTM C 618, Class F.
3. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C 595.
5. Silica Fume: ASTM C 1240, amorphous silica.

B. Normal-Weight Aggregates: ASTM C 33. Provide aggregates from a single source.

1. Coarse-Aggregate: Well-graded crushed stone or washed gravel with maximum aggregate size of 1-1/2 inches nominal for foundations and 1 inch for walls, slabs, beams and columns.
2. Fine Aggregate: Well-graded, washed, natural or manufactured sand free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94 and potable.

2.2 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494, Type A.
2. Retarding Admixture: ASTM C 494, Type B.
3. Accelerating Admixture: ASTM C 494, Type C.
4. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
5. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
6. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
7. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
8. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

2.3 CURING MATERIALS

A. Evaporation Retarder

1. Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 ounces per square yard when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Curing Compound: Clear, waterborne, membrane-forming compound conforming to ASTM C 309, Type 1, Class B, dissipating.

2.4 RELATED MATERIALS

A. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.

B. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.5 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301. The proposed mix designs shall be accompanied by complete standard deviation analysis or trial mixture data.

B. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

C. The proposed mix design shall identify the amount of water to be withheld for addition at the project site.

D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 50 percent.
4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

E. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.6 CONCRETE MIXTURES FOR MISCELLANEOUS CONCRETE

A. Minimum Compressive Strength: 4500 psi at 28 days.

B. Maximum Water-Cementitious Materials Ratio: 0.45

C. Air Content: 5-1/2 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete:

1. Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.
2. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing:

1. Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M.
2. Mix concrete materials in appropriate drum-type batch machine mixer.
3. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
4. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.

C. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.

B. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.2 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Isolation Joints
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.3 CONCRETE PLACEMENT

A. General
1. Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete".
2. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
3. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Slope surfaces uniformly to drains where required.
6. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
7. Do not further disturb slab surfaces before starting finishing operations.

B. Cold-Weather Placement:

1. Comply with ACI 306.1 and as follows: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When average air temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
4. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

C. Hot-Weather Placement

1. Comply with ACI 305.1 and as follows: Protect from hot weather conditions which can impair the quality and strength of concrete.

    a. Maintain concrete temperature below 90 deg F at time of placement.
    b. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water.
    c. Using liquid nitrogen to cool concrete at Contractor's option.
    d. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete.
    e. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.4 FINISHING FLOORS AND SLABS

A. General

1. Comply with recommendations of ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
2. After screeding, consolidating, and leveling concrete slabs, do not work surface or begin floating until all bleed water had disappeared.

B. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.5 MISCELLANEOUS CONCRETE ITEMS

A. Filling In

1. Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.6 CONCRETE PROTECTING AND CURING

A. General

1. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 for hot-weather protection during curing.
2. Start initial curing right after finishing, and keep continuously moist for at least 7 days. Begin final curing immediately after initial curing and continue for at least 7 days. Use sun shades, wind breaks, and evaporation retardant when necessary in accordance with ACI 308 recommendations.

B. Evaporation Retarder

1. Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations.
2. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Unformed Surfaces

1. Begin curing immediately after finishing concrete.
2. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
3. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

a. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

1) Water.
2) Continuous water-fog spray.
3) Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers

b. Moisture-Retaining-Cover Curing

1) Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
2) Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

c. Curing Compound

1) Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions.
2) Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
3) After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

d. Curing and Sealing Compound:

1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions.
2) Recoat areas subjected to heavy rainfall within three hours after initial application.
3) Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.7 CONCRETE SURFACE REPAIRS

A. Defective Concrete

1. Repair and patch defective areas as approved by the Architect.
2. Remove and replace concrete that cannot be repaired and patched to the Architect's approval.

B. Patching Mortar

1. Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Unformed Surfaces
   1. Surface defects include crazing, cracks wider than 0.01", spalls, pop-outs, honeycombs, rock pockets, voids and other objectionable conditions.
   2. Repair defects on unformed surfaces that affect concrete's durability and structural performance as determined by the Architect, by cutting out defective area to sound concrete. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with fresh concrete to match existing before bonding agent has dried.
   3. Repair isolated random cracks with the specified crack sealer following manufacturer's instructions.

END OF SECTION 03300

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes:

1. Furnishing and installing rough carpentry, including rough hardware.
2. Rough carpentry consists of wood construction both temporary and permanent that is not exposed to view in completed building. Rough carpentry work includes proper installation of grounds, wood or metal, nailing strips, blocking, etc., necessary or required to produce an adequate and substantial base for support of finishes, material, fittings and equipment.
3. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated. Types of work in this section include rough carpentry for:
   a. Wood framing
   b. Timbers for posts and beams
   c. Wood grounds, nailers, blocking and sleepers, including that required for roofing.
   d. Wood furring
   e. Plywood Sheathing

1.2 REFERENCES

A. Lumber Standards:
Comply with PS 20 and with applicable rules of the respective grading and inspecting agencies for species and products indicated.

1. American Wood Preservers Bureau Standards
2. Western Wood Products Association Use Manual
3. American Plywood Association (APA) Design/Construction Guide

B. Plywood Product Standards:
Comply with PS 1 (ANSI A 199.1) or, for products not manufactured under PS 1 provisions, with applicable APA Performance Standard for type of panel indicated.

1.3 SUBMITTALS

A. Product Data:
Submit manufacturer's specifications and installation instructions for materials listed below:

1. Underlayment
2. Plywood

B. Material Certificates:
Where dimensional lumber is provided to comply with minimum allowable unit stresses, submit listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in the form of a signed copy of applicable portion of lumber producer's grading rules showing design values for selected species and grade. Design values shall be as approved by the Board of Review of the American Lumber Standards Committee.

C. Wood Treatment Data:

1. Submit treatment manufacturer's instructions for proper use of each type of treated material.
2. Pressure Treatment: For each type specified, include certification by treating plant stating chemicals and process used, net amount of preservative retained and conformance with applicable standards.
3. Water-Borne Preservatives: For each type include statement that moisture content of treated materials was reduced to a maximum of 15% prior to shipment to the project site.
4. Fire Retardant Treatment: Include certification by treating plant that treatment material complies with governing ordinances and that treatment will not bleed through finished surfaces.

1.4 PRODUCT HANDLING

A. Protection:
1. Deliver material to job site and store, in safe area, out of way of traffic and shored up off ground surface.
2. Identify framing lumber by grades, and store each grade separately from other grades.
3. Protect metals with adequate waterproof outer wrapping.
4. Use extreme care in off loading of lumber to prevent damage, splitting, and breaking of materials.
5. Delivery and Storage: Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation within stacks. Do not store materials directly on the ground.

1.5 JOB CONDITIONS

Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.

PART 2 - PRODUCTS

2.1 LUMBER: GENERAL

A. Factory-mark each piece of lumber with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.

B. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.

C. Provide dressed lumber, S4S, unless otherwise indicated.

D. Provide kiln-dried lumber 15% maximum moisture content at time of dressing.

2.2 FRAMING LUMBER

A. Stud Framing (2" through 4" thick)
1. Light Framing (less than 6" wide): Provide "Stud" grade lumber for stud framing and "Standard" grade for other light framing, any species.
2. Sole plates for wood stud walls shall be preservative treated.

B. Floor Joist, Roof Joist and Rafter Framing (2" through 4" thick) (6" and wider): Provide No. 2 grade, Hem fir, Douglas Fir or SPF.

2.3 MISCELLANEOUS LUMBER

A. Provide Construction Grade light framing size lumber of any species for support or attachment of other work including cant strips, bucks, nails, blocking, furring, grounds, stripping and similar members. Provide kiln-dried lumber with 15% maximum moisture content.

B. Where rough carpentry work is exposed to the weather, in ground contact, used as blocking or grounds in roofing, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153)

2.4 PLYWOOD

A. Plywood sheathing shall be 3/4" thick AB Marine Grade 4'x8' sheets.

B. Trademark:
Identify each plywood panel with appropriate APA trademark.

2.5 MISCELLANEOUS MATERIALS

A. Fasteners and Anchorages:
1. Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommending nails.
2. Where rough carpentry work is exposed to the weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153)

B. Rough Hardware
1. Steel Items:
   a. Comply with ASTM A7 or ASTM A36.
   b. Use galvanized at exterior locations.
2. Machine bolts: Comply with ASTM A307.
3. Lag bolts: Comply with Fed Spec FF-B-561.
4. Nails:
   a. Use common except as otherwise noted.
   b. Comply with Fed Spec FF-N-1.
   c. Use galvanized at exterior locations.
5. Plywood Sheathing Screws: Wafer head screw designed for attachment of plywood to light gauge metal supports, #10 zinc plate screw with #3 self drilling point; length appropriate for engaging thread in substrate. Fasteners anchored solely into plywood sheathing for roof anchor clips shall be sized not to over-penetrate sheathing.

2.6 OTHER MATERIALS

A. Contractor selects other materials, not specifically described but required for a complete and proper installation, subject to Architect's approval.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
1. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.
3. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.
4. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

B. Wood Grounds, Nailers, Blocking, and Sleepers:
1. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
2. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise show. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
3. Provide solid wood blocking concealed within stud wall framing for all wall mounted toilet accessories, wall and ceiling mounted cabinets, and wall mounted shelving.
4. Provide permanent grounds of dressed, preservative treated, key beveled lumber not less than 1-1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

3.2 WOOD FURRING

A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finished work.

B. Install firestop furred spaces on walls at each floor level, with wood blocking or incombustible materials, accurately fitted to close furred spaces.

C. Furring to Receive Plywood paneling: Unless otherwise shown, provide 1" x 3" furring at 2' on center, horizontally and vertically.

D. Furring to Receive Gypsum Drywall: Unless otherwise shown, provide 1" x 2" furring at 16" on center vertically.

E. Furring to Receive Plaster Lath: Unless otherwise shown, provide 1" x 2" furring at 16" on center, vertically.

F. Suspended Furring: Provide size and spacing shown, including hangers and attachment devices. Level to a tolerance of 1/8" in 10', except 1/4" in 10' for thick-coat plaster work.

3.3 INSTALLATION OF PLYWOOD

A. General: Comply with applicable recommendations contained in Form No. E 304, "APA Design/Construction Guide - Residential and Commercial", for types of plywood products and applications indicated.
Fastening Methods: Fasten panels as indicated below:
1. Plywood Backing Panels: Nail to supports

B. Cover sheathing with building paper, lapped and nailed with roofing nails.

END OF SECTION

SECTION 06 20 00

FINISH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

Finish carpentry includes carpentry work which is exposed to view, and which is not specified as part of other sections.

A. Types of finish carpentry work in this section include:
   1. Exterior running and standing trim.
   2. Exterior exposed rafters, trusses, and skip-sheathing

1.2 SUBMITTALS

A. Product Data:
   Submit manufacturer's specifications and installation instructions for each item of factory fabricated siding and paneling.

B. Samples:
   Submit the following samples for each species and cut or pattern of finish carpentry:
   1. Exterior standing running trim: 2'-0" long x full board or molding width, finished on one side and one edge.

PART 2 – PRODUCT

2.1 WOOD PRODUCT QUALITY STANDARDS

A. Softwood Lumber Standards:
   Comply with PS 20 and with applicable grading rules of the respective grading inspection agency for the species and product indicated.

B. Woodworking Standard:
   Where indicated for a specific product comply with specified provision of the following: Architectural Woodwork Institute "Quality Standards".

2.2 MATERIALS

A. General:
   Nominal sizes are indicated on the drawings, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and patterns as shown, unless otherwise indicated.

B. Moisture Content of Softwood Lumber:
   Provide seasoned (KD) lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.

C. Moisture Content of Hardwood Lumber:
   Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation within the ranges required in the referenced woodworking standard.

2.3 EXTERIOR FINISH CARPENTRY

A. Standing and Running Trim:

For trim in form of boards and worked products, provide lumber complying with the following requirements including those of the grading agency listed with species.

1. Species: Southern Cypress or Recovered Cypress
   a. Grade: Select
2. Texture:
   a. Surfaced (Smooth) both sides

B. Rafters, Trusses, and Skip-Sheathing:
For rafters, trusses, and skip-sheathing provide lumber worked to profile and size indicated and complying with the following requirements including those of grading agency indicated:

1. Species: Southern Cypress or Recovered Cypress
   a. Grade: Select
2. Texture:
   a. Surfaced (smooth)

2.4 MISCELLANEOUS MATERIALS

A. Fasteners and Anchorages:
   1. Provide nails, screws and other anchoring devises of the type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
   2. Where finish carpentry is exposed on exterior or in areas of high relative humidity, provide fasteners and anchorages with a hot dipped zinc coating (ASTM A 153).

PART 3 – EXECUTION

3.1 PREPARATION

A. Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.

B. Backprime lumber for painted finish exposed on the exterior. Comply with requirements of section on painting within Division 9 for primers and their application.

3.2 FINISH CARPENTRY INSTALLATION

A. General:
   1. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to babricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.
   2. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/16" maximum offset in flush adjoining 1/8" maximum offsets in revealed adjoining surfaces.
   3. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

B. Standing and Running Trim:
   1. Install with minimum number of joints possible, using full-length pieces (from maximum lengths of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end to end joints.
   2. Make exterior joints water resistant by careful fitting.
   3. Apply flat grain lumber with bark side exposed to weather.

C. Anchorage and Fasteners.

1. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nails for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.
2. Attach siding to framing to comply with siding manufacturer's instructions including requirements for type, size, materials, location and spacing of fasteners.

3.3 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

A. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform.

B. Clean finish carpentry work on exposed and semi-exposed surfaces. Touch-up shop applied finishes to restore damaged or soiled areas.

C. Contractor shall maintain conditions necessary to ensure that work will be without damage or deterioration at the time of acceptance.

END OF SECTION

SECTION 06 25 00

WOOD RESTORATION

PART 1 – GENERAL

1.1 SUMMARY
Section includes restoration of existing rough and finished wood building components.

1.2 SUBMITTALS
A. Restorer's information
Provide references and company resume for window restoration company to be engaged for the work.

B. Products: Submit product information for the following:
1. Chemical paint stripping product

PART 2 PRODUCTS

2.1 MATERIALS
A. See specification section 06 20 00 – Finish Carpentry

2.2 CHEMICAL PAINT STRIPPING PRODUCTS
A. On-Site Paint Removal:
For stripping of paint and finishes from existing wood rafters, trusses, rake and fascia boards , use "Ultra-Strip" paint remover by Back-To-nature-Products or approved equal. Clean with "Ready-Strip Wash".

2.3 REPAIR PRODUCTS
A. Epoxy Filler:
Where wood requires replacement or sections of wood are missing, use "WoodEpox" 2-part epoxy as manufactured by Abatron, Inc. or approved equal.

B. Epoxy Stabilizer:
Where wood requires stabilization due to the presence of rotted, soft material, and as preparation before further repairs are effected, use "LiquidWood' 2 –part consolidant epoxy as manufactured by Abotron, Inc., or approved equal.

PART 3 – EXECUTION

3.1 EXAMINATION
A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 REMOVAL OF EXISTING ROOFING AND SHEATHING
A. Remove existing plywood sheathing and metal roof panels down to existing wood rafters. Protect existing rafters, trusses, rake and fascia boards to remain.

3.3 RESTORATION
A. Mock-Up:

Prior to initiating the paint stripping process on the entire project, the Contractor shall dismantle and strip paint from (1) rafter and truss to demonstrate the Contractor's ability to produce satisfactory results acceptable to the Architect, Owner and Historical Trust.

B. Protection of Existing Improvements:
Provide masking and protection of existing finishes and improvements from restoration processes. Cover and protect existing finishes from contamination and/or damage do to paint removal operations, paint application, and other work.

C. Rafters, Trusses, Rake and Fascia Board Trim:
1. Strip all paint and finishes from existing wood components.
2. Remove any deteriorated wood.
3. Patch all wood holes and scars with epoxy material.
4. For large areas that cannot be patched with epoxy, replace wood with new material, doweled and glued in place.
5. Prime and paint per specification section 09 91 00.

3.4 FINISH
A. Perform cleaning to remove finish materials that interfere or detract from appearance.

END OF SECTION

SECTION 07 41 16
PREFORMED METAL STANDING SEAM ROOFING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This section covers the pre-finished, pre-fabricated Architectural standing seam roof system. All metal trim, accessories, fasteners, insulation and sealants indicated on the drawings as part of this section.
B. Drawings and general provisions of the Contract, including general and Supplementary Conditions and Division 01 Specifications, apply to this section.

1.2 SUMMARY

A. Section Includes
    1. Factory formed Standing Seam metal roof panels.

1.3 DEFINITIONS

A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal, and accessories necessary for a complete weathertight roofing system.
B. References:
    1. American Society for Testing and Materials (ASTM)
        a. ASTM A 653: Steel Sheet, Zinc Coated by the Hot Dip Process
        b. ASTM A 792: Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot Dip Process
        c. ASTM B 209: Aluminum and Aluminum Alloy Sheet and Plate
        d. ASTM B370 Standard Specification for Copper Sheet and Strip for Building Construction
    2. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
        a. SMACNA Architectural Sheet Metal Manual, 1993 edition
    3. American Iron and Steel Institute (AISI)
        a. AISI Cold Formed Steel Design Manual
    4. Aluminum Association
        a. Aluminum Design Manual
    5. Metal Construction Association
        a. Preformed metal Wall Guidelines
    6. Code References
        a. ASCE, Minimum Loads for Buildings and Other Structures
        b. BOCA National Building Codes
        c. UBC Uniform Building Code
        d. SBC Standard Building Code

1.4 QUALITY ASSURANCE

A. Petersen Aluminum Corp, Elk Grove Village, IL, 800-323-1960 products establish a minimum of quality required, or approved equal.
B. Manufacturer and erector shall demonstrate experience of a minimum of five (5) years in this type of project.
C. Panels shall be factory-produced only. No portable, installer-owned or installer-rented machines will be permitted.

1.5 SUBSTITUTIONS

A. The material, products and equipment specified in this section establish a standard for required function, dimension, appearance and quality to be met by any proposed substitution.

1.6 SYSTEM DESCRIPTION

A. Material to comply with:
    1. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

1.7 ROOF SYSTEM PERFORMANCE TESTING

A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation or other defects in construction.
B. Roof System shall be designed to meet Standard Building Code Wind Load requirements.
C. Panels to meet:
    1. Water Penetration: When tested per ASTM E-283/1680 and ASTM E-331/1646 there shall be no uncontrolled water penetration or air infiltration through the panel joints.
    2. UL 2218 - Impact Resistance rated.

1.8 WARRANTIES

A. Finish warranty: Manufacturer's standard form in which manufacturer agrees to repair finish or replace standing seam metal roof panels that show evidence of deterioration of factory-applied finish within specified warranty period.
    1. Exposed Panels Finish – deterioration includes the following:
        a. Color fading more than 5 hunter units when tested according to ASTM D 2244
        b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214
        c. Cracking, checking, peeling or failure of a paint to adhere to a bare metal.

2. Warranty Period: 20 Years from the date of substantial completion

B. Applicator shall furnish written warranty for a two (2) year period from date of substantial completion of building covering repairs required to maintain roof and flashings in watertight condition.

1.9 SUBMITTALS

A. Furnish detailed drawings showing profile and gauge of exterior sheets, location and type of fasteners, location, gauges, shape and method of attachment of all trim locations and types of sealants, and any other details as may be required for a weather-tight installation.
B. Provide finish samples of all colors specified.
C. Shop drawings: Show fabrication and installation layouts of metal roof panels, metal wall panels or metal soffit panels, details of edge conditions, side-seam joints, panel profiles, corners, anchorages, trim, flashings, closures and accessories, and special details. Distinguish between factory and field-assembled work

1.10 DELIVERY, STORAGE AND HANDLING

A. Ordering: Comply with manufacturer's ordering instruction and lead time requirements to avoid construction delays.
B. Deliver components, sheets, metal roof panels and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
C. Unload, store and erect metal roof panels in a manner to prevent bending, warping, twisting and surface damage.
D. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting or other surface damage.
E. Protect strippable protective coating on any metal coated product from exposure to sunlight and high humidity, except to the extent necessary for material installation.

1.11 PROJECT CONDITIONS

A. Weather Limitations: proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed.
B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

1.12 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports and roof penetrations with actual equipment provided.

B. Coordinate metal roof panels with rain drainage work, flashing, trim and construction of decks, parapet walls and other adjoining work to provide a leakproof, secure and noncorrosive installation.

PART 2 - PRODUCTS

2.1 PANEL DESIGN

A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates and accessories required for a weathertight installation.
B. Roof panels shall be Redi-Roof Standing Seam in 18" widths with 1 3/8" high seams without offsets or approved equal.
C. Panels to be produced Smooth - Factory Standard. Specifier note: Factory standard is smooth unless specified.
D. Panels to be designed for attachment with concealed fastener clips, spaced as required by the manufacturer to provide for both positive and negative design loads, while allowing for the expansion and contraction of the entire roof system resulting from variations in temperature.
E. Forming: Use continuous end rolling method. No end laps on panels. No portable rollforming machines will be permitted on this project, no installer-owned or installer-rented machines will be permitted. It is the intent of the Architect to provide Factory-Manufactured panel systems only for this project.

2.2 ACCEPTABLE MANUFACTURERS

A. This project is detailed around the roofing product of Petersen Aluminum Corporation Petersen Aluminum Corp, Elk Grove Village, IL, 800-323-1960, Redi-Roof Standing Seam, or approved equal.

2.3 MATERIALS AND FINISHES

A. Preformed roofing panels shall be fabricated of .032 Aluminum
B. Color shall be *Standard Pac-Clad Finish.
C. Finish shall be Kynar 500 or Hylar 5000 Fluorocarbon coating with a top side film thickness of 0.70 to 0.90 mil over a 0.25 to 0.3 mil prime coat to provide a total dry film thickness of 0.95 to 1.25 mil, to meet AAMA 621. Bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesions, flexibility and longevity as specified by Kynar 500 or Hylar 5000 finish supplier.
D. Trim: Trim shall be fabricated of the same material and finish to match the profile, and will be press broken in lengths of 10 to 12 feet. Trim shall be formed only by the manufacturer of their approved dealer. Trim to be erected in overlapped

condition. Use lap strips only as indicated on drawings. Miter conditions shall be factory welded material to match the sheeting.

E. Closures: use composition or metal profiled closures at the top of each elevation to close ends of the panels. Metal closures to be made in the same material and finish as face sheet.
F. Accessories/Fasteners: Fasteners shall be of type, material, size, corrosion resistance, holding power and other properties required to fasten miscellaneous framing members to substrates. Accessories and their fasteners shall be capable of resisting the specified design wind uplift forces and shall allow for thermal movement of the roof panel system. Exposed fasteners shall not restrict free movement of the roof panel system resulting from thermal forces, except at designed points of roof panel fixity
G. Substrate shall be 3/4" Marine Grade AB Plywood; primed and painted on underside face to match rafters.
H. Roofing Underlayment
    1. Asphalt Saturated Roofing Felt Underlayment:

       No. 30, unperforated organic felt, complying with ASTM D 226, 36" wide.Underlayment shall be laid in horizontal layers with joints lapped toward the eaves a minimum of 6, and well secured along laps and at ends as necessary to properly hold the felt in place. All underlayment shall be preserved unbroken and whole.

    2. Waterproof Underlayment:

       36" wide Grace Ice and Water Shield roofing underlayment by GCP Technologies or approved equal.

I. Sealants
    1. Provide two-part polysulfide class B non-sag type for vertical and horizontal joints or
    2. One part polysulfide not containing pitch or phenolic extenders or
    3. Exterior grade silicone sealant recommended by roofing manufacturer or
    4. One part non-sag, gun grade exterior type polyurethane recommended by the roofing manufacturer.

2.4 FABRICATION

A. Comply with dimensions, profile limitations, gauges and fabrication details shown and if not shown, provide manufacturer's standard product fabrication.
B. Fabricate components of the system in factory, ready for field assembly.
C. Fabricate components and assemble units to comply with fire performance requirements specified.
D. Apply specified finishes in conformance with manufacturer's standard, and according to manufacturer's instructions.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine alignment of structural steel and related supports, primary and secondary roof framing, solid roof sheathing, prior to installation.
B. For the record, prepare written report, endorsed by installer, listing conditions detrimental to performance of the Work.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FASTENERS

A. Secure units to supports and sheathing.
B. Place fasteners as indicated in manufacturer's standards; fasteners shall be sized so as to not over-penetrate plywood sheathing.

3.3 INSTALLATION

A. Install new plywood sheathing such that vertical butt joints land over top of rafters, and that no vertical butt joints are left unsupported.
B. Panels shall be installed plumb and true in a proper alignment and in relation to the structural framing. The erector must have at least five years successful experience with similar applications.
C. Install metal panels, fasteners, trim and related sealants in accordance with approved shop drawings and as may be required for a weather-tight installation.
D. Remove all strippable coating and provide a dry-wipe down cleaning of the panels as they are erected.

3.4 DAMAGED MATERIAL

A. Upon determination of responsibility, repair or replace damaged metal panels and trim to the satisfaction of the Architect and Owner.

END OF SECTION

07 60 00
FLASHING AND SHEET METAL

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of each type of flashing and sheet metal work is indicated on the drawings and by provisions of this section.

B. The types of work specified in this section include the following:
1. Metal counter flashing; and base flashing
2. Metal wall flashing and expansion joints
3. Exposed metal trim
4. Prefabricated Coping
5. Miscellaneous sheet metal accessories

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product specifications, installation instructions and general recommendations for each specified sheet material and fabricated product.

B. Shop Drawings: Submit shop drawings showing layout, joining, profiles, and anchorages of fabricated work, including major counter flashings, trim/facia units, gutters, downspouts, scuppers and expansion joint systems; layouts at ¼" scale, details at 3" scale.

C. Samples: Submit two, 8" square samples of specified sheet materials to be exposed as finished surfaces.

1.3 QUALITY ASSURANCE

A. Job Conditions: Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of the work and protect of materials and finishes.

PART 2 – PRODUCTS

2.1 FLASHING AND SHEET METAL MATERIALS

A. Aluminum: ASTM B 209, alloy 3003, temper H14, Kynar 500 finish; 0.40" except as otherwise indicated.

B. Lead Coated Copper: Provide gutter and downspouts with 16 ounce copper sheets factory coated with lead finish. Provide lead coating of minimum 0.06 pounds per square foot on exposed copper surfaces.

C. Zinc Coated Steel: Commercial quality with 0.20% copper, ASTM A 525 except ASTM A 527 for lock forming, G90 hot dip galvainized, mill phosphatized where indicated for painting; 0.0359" thick (20 gage) except as otherwise indicated.

D. Stainless Steel: AISI Type 302/304, ASTM A 167, 2D annealed finish, soft except where harder temper required for forming or performance; 0.015" thick (28 gage) except as otherwise indicated.

E. Aluminum: ASTM B 209, alloy 3003, temper H14, AA-C22A41 clear anodized finish; 0.032" thick (20 gage) except as otherwise indicated.

F. Copper: ASTM B370, cold rolled except where soft temper is required for forming; 16 ounce (0.0216" thick) except as otherwise indicated.

G. Extruded Aluminum: Manufacturer's standard extrusions of sizes and profiles indicated, 6063-T52, AA-CCA41 clear anodized finish; 0.08" minimum thickness for primary legs of extrusions.

H. Elastic Sheet Membrane:
Manufacturer's standard flexible, elastic, black, non-reinforced, flashing sheet of 50 to 65 mils thickness; 50-70 Shore A hardness (ASTM D2240); 1200 psi tensile strength (ASTM D412); 120 pounds per linear inch tear resistance (ASTM D624, Die C); ultimate elongation of 250% (ASTM D412): brittleness temperature of -30 degrees F (ASTM D746): resistance to ozone aging of no cracks for 10% elongated sample for 100 hours in 50 ppm ozone at 104 degrees F (ASTM D573); resistance to heat aging of maximum hardness increase of 15 points, elongation reduction of 40%, and tensile strength reduction of 30%, for 70 hours at 212 degrees F (ASTM D 573).
1. Provide neoprene synthetic rubber sheet.
2. provide butyl synthetic rubber sheet.
3. Provide EPDM synthetic rubber sheet.

2.2 FORMED UNITS

A. General Metal Fabrication: Shop fabricate work to the greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

B. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder.

C. Expansion Provision: Where lapped or bayonet type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant (concealed within joints).

D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with industry standards.

E. Separation: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

F. Aluminum Extrusion Units:
1. Fabricate extruded aluminum running units with formed or extruded aluminum joint covers, for installation behind main members.
2. Fabricate mitered and welded corner units.

G. Shop Finish, Rain Drainage: Provide manufacturer's standard baked on bronze acrylic ship finish on sheet metal rain drainage units (gutters, downspouts, and similar exposed units); 1.0 mil dry film thickness.

2.3 FABRICATED METAL ROOFING ACCESSORIES

A. Aluminum Coping
1. Manufacturer's standard sizes and profiles or as indicated on the drawings, Kynar 500 finish, 0.050 minimum thickness for primary legs of extrusions.
2. Provide prefabricated system including preformed coping, continuous (22) gauge inside cleat and continuous (22) gauge outside cleat, 8" concealed splice plates with factory applied, dual, non-curing, isocryl butyl sealant strips at each joint.
3. Material: (24) (22) ga. galv, (.050") (.063") aluminum.
4. Inside face (4 inches) (as indicated on drawings)
5. Outside face (6 inches) (12 inches) (as indicted on drawing)
6. Factory fabricated mitered corners, endcaps, endwall flashings, pilaster caps, and accessories.
7. Provide Perma-Tite Continuous Cleat Coping by Metal-Era Roof Edge Solutions.

B. Aluminum Roof Edge
1. Manufacturer's standard sized and profiles or as indicated on the drawings, Kynar 500 finish, 0.050 minimum thickness. Aluminum with 7" face dimension unless otherwise indicated.
2. Provide prefabricated system including pre-formed roof edge with continuous extruded aluminum anchor bar.
3. Fascia Height: (4 inches) (5-1/2 inches) (7 inches) (8-1/2 inches)
4. Material: (24) ga. galv steel, (.040") aluminum.
5. Provide Anchor-Tite Standard Fascia by Metal-Era Roof Edge Solutions.

C. Aluminum Gutters and Downspouts: ASTM B 2009, alloy 3003, temper 1114, .040" thick, Kynar 500 finish, except as otherwise indicated.

2.4 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Fasteners: Same metal as flashing/sheet metal or, other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

B. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gage required for performance.

C. Reglet:
1. Concrete: Stainless Steel, type "304-0.020" Fry Reglet "CO" or equal.
2. Masonry: Stainless Steel, type "304-0.020" Fry Reglet "MA' or equal.
3. Surface Reglets: Stainless Steel, type "304-0.020" Fry Reglet 'SM' or equal.

PART 3 – EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

B. Underlayment: Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a course of paper slip sheet and a course of polyethylene underlayment.

C. Installation:

1. Bed flanges of work in roofing sealant where required for waterproof performance.
2. Reglet
   a. Install reglet and counter flashing in accordance with approved shop drawings and manufacturer's product data to comply with specified performance requirements. Reglet and counter flashing components shall be true to line, without buckling, creasing, warp or bin in finished surfaces.
   b. Coordinate counter flashing at roof surfaces with roofing work to provide weather tight condition at roof terminations.
   c. Isolate dissimilar materials to prevent electrolysis. Separate bituminous coating.
   d. Secure reglets and counter flashing using continuous cleats, clips and fasteners in accordance with product data and as indicated.
3. Install counterflashing in reglets, either by snap-in seal arrangement, or by wedging in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.
4. Install elastic flashing without stretching. Install elastic flashing filler strips to provide for movement by forming loops of bellows in width of flashing. Locate filler strips to facilitate complete drainage of water from flashing. Seam flashing sheets with adhesive, and anchor edges in manner indicated.
5. Nail flanges of expansion joint units to curb nailers, at maximum spacing of 6". Complete seams at joints between units, to form a continuous waterproof system.
6. Solder all joints (except for expansion joints) by thoroughly cleaning metal surfaces, apply flux in accordance with manufacturer's instructions, solder joint using heat sources and methods as recommended by solder manufacturer and in accordance with SMACNA standards. Apply heat in a manner that draws solder effectively into the sheet metal joint. Clean dull, or weathered copper with muriatic acid prior to soldering. Clean surface thoroughly ensuring that all acid is washed off of the surface prior to the application of flux.

3.2 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

B. Contractor shall protect sheet metal and flashing work during construction to ensure that work will not be damaged.

END OF SECTION 07 60 00

SECTION 07 92 00

JOINT SEALERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The applications for joint sealers as work of this section include the following:
   1. Pavement and sidewalk joints
   2. Concrete construction joints
   3. Flashing and coping joints
   4. Interior wall/ceiling joints

1.3 GENERAL PERFORMANCE REQUIREMENTS

A. Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

1.4 REFERENCES

A. ASTM D 1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.

B. ASTM D 1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Open-Cell Foam).

C. FS TT-S-001543 - Sealing Compound, Silicone Rubber Base.

D. SWI (Sealing and Waterproofers Institute) - Sealant and Caulking Guide Specification.

1.5 SUBMITTALS

A. Product Data: Manufacturer's printed data indicating sealant chemical characteristics, performance criteria, limitations, and color availability for each elastomeric product required.

B. Samples: Two samples, 2 inches by 2 inches in size illustrating colors selected.

C. Certificate: Manufacturer's certificate that products meet or exceed specified requirements.

D. Warranty: Include installed sealants and accessories against failure to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or not cure

1.6 JOB CONDITIONS

A. Weather Conditions:
   Do not proceed with installation of liquid sealants under unfavorable weather conditions. Install elastomeric sealants when temperature is in lower third of temperature range recommended by the manufacturer for installation.

1.7 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this Section with a minimum of 20 continuous years of documented experience.

B. Installer: Company specializing in installation of work in this Section with a minimum 5 continuous years of documented experience and approved by sealant manufacturer.

C. Comply with Sealant and Waterproofers Institute requirements for materials and installation.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Do not install solvent curing sealants in enclosed buildings spaces without sufficient ventilation to maintain LTL solvent vapor levels.

B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.9 WARRANTY

A. Provide 5-year warranty.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. General:
Manufacturers listed in this article include those known to produce the indicated category of prime joint sealer material, either as a nominally pure generic product or as an equivalent performance modification thereof or proprietary product.

B. Manufacturer:
Subject to compliance with requirements, provide products of one of the following:
1. Euclid Chemical
2. W.R. Meadows
3. Pecora Corp.
4. Sonneborn/Contech
5. Tremco, Inc.

2.2 SEALER MATERIALS

A. General Sealer Requirements:
Provide colors indicated or, if not otherwise indicated, as selected by the Architect from the manufacturer's standard colors. Select materials for compatibility with joint surfaces and other indicated exposures, and except as otherwise indicated select modulus of elasticity and hardness or grade recommended by the manufacturer for each application indicated. Where exposed to foot traffic, select non-tracking materials of sufficient strength and hardness to withstand stiletto heel traffic without damage or deterioration of sealer system.

B. Single Component Silicon Rubber Sealant:
Except as otherwise indicated, provide manufacturer's standard, ultra low modulus, high performance, one part, silicone rubber based, air curing, non-sag, elastomeric sealant; complying with ASTM C920 Type S Class 25 Grade NS, FS TT-S-001543A Class A Type Non-sag. Provide Tremco "Spectrem I" or approved equal.

C. Single Component Self Leveling Polyurethane:
Single component, traffic rated, pourable, semi-self leveling, gun grade, one-part moisture curing, low modulus polyurethane sealent; complying with ASTM C920, type S, grade P, class 50, use T, M, A, O, and I. Tremco "Vulkem 45SSL" or approved equal.

D. Single Component Polyurethane:
Single component, gun grade, modified polyurethane sealant for exterior exposures meeting Federal Sepcification TT-S-00230C, Type II, Class A; CGSB 19-GP-13, and ASTM C920, type S, Grade NS, Class 25, Use NT, M, A, and O. Provide Tremco "Dymonic" or approved equal.

E. Single Component Siliconized Acrylic Latex Sealant:
Single component, gun grade, pure acrylic latex sealant for general purpose interior and exterior caulking and paintable meeting ASTM C-834, Tremco "Tremflex 834" or approved equal. VOC content maximum 42 grams/liter.

F. Multi Component Traffic Sealant:
Multi component, self leveling polyurethane joint sealant specifically developed for sealing concrete expansion and control joints on vehicular surfaces, ASTM C920, Type M, Grade P, Class 25, Use T, M, A, O. Provide Tremco "THC-900" together with compatable primer.

G. Electrical Box Seal: Sheet caulking.

2.3 PRIMERS
A. Use only nonstaining primers that have been tested for durability on surfaces to be sealed and are specifically recommended for this installation by manufacturer of sealant used.

2.4 CELLULAR/FOAM JOINT FILLERS AND SEALANT BACKERS
A. Closed Cell Synthetic Rubber Joint Filler:
Provide expanded synthetic rubber complying with ASTM D1056, class SC-E of 2 to 5 psi compression deflection; except provide 13 to 17 psi compression deflection where filler is applied under sealant exposed to traffic.

B. Fiber Expansion Joint: Preformed cellular fiber complying with ASTM D1751.

2.5 BOND-PREVENTATIVE MATERIALS
A. Use only one of following as best suited for application and as recommended by sealant manufacturer
1. Polyethylene tape, pressure-sensitive adhesive, with adhesive required only to hold tape to construction materials as indicated.
2. Aluminum foil complying with MIL-A-148E.
3. Wax paper complying with Fed Spec UU-P-270.

2.6 MASKING TAPE
For masking around joints, provide masking tape complying with Fed Spec UU-T-106C.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS
Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 JOINT PREPARATION
A. Clean joint surfaces immediately before installation of gaskets, sealants or caulking compounds. Remove dirt, insecure coatings, moisture and other substrates which could interfere with seal of the gasket or bond of sealant or caulking compound. Etch concrete

and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by the sealant manufacturer.

B. Prime or seal joint surfaces where indicated, and where recommended by the sealant manufacturer. Confine primer/sealer to areas of sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Concrete and ceramic tile surfaces:
   1. Install only on surfaces that are dry, sound, and well brushed, wiping free from dust.
   2. At open joints, remove dust by mechanically blown compressed air if required.
   3. Use solvent to remove oil and grease, wiping surfaces with clean rags.
   4. Where surfaces have been treated, remove surface treatment by sandblasting or wire brushing.
   5. Remove laitance and mortar from joint cavities.
   6. Where backstop is required, insert approved backup material into joint cavity to depth needed.

D. Steel surface:
   1. Steel surfaces in contact with sealant:
      a. Clean metal surface with power tools as required to archive acceptable surface or bond.
      b. Use solvent to remove oil and grease, wiping surfaces with clean rags.
   2. Remove protective coatings on steel with power tools or by using solvent that leaves no residue.

E. Aluminum surfaces:
   1. Aluminum surfaces in contact with sealant:
      a. Remove temporary protective coatings, dirt, oil, and grease.
      b. When masking tape is used for protective cover, install tape just prior to applying sealant.
   2. Use only nonstaining solvents to remove protective cover, as recommended for that purpose by manufacturer of aluminum work.

3.3 INSTALLATION

A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

B. Use only primer recommended by sealant manufacturer and approved by Architect for particular installation, applying in strict accordance with manufacturer's recommendations as approved by Architects.

C. Set joint filler units at depth or position in joint as indicated to coordinate with other work, including installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between ends of joint filler units.

D. Install sealant backer rod for liquid applied sealants, except where shown to be omitted or recommended to be omitted by the sealant manufacturer for application indicated.
   1. Use only backup material recommended by sealant manufacturer and approved by Architect for particular installation, compressing backup material 25% to 50% to achieve positive and secure fit
   2. When using backup of tube or rod stock, avoid lengthwise stretching of material. Do not twist or braid hose or rod backup stock.

E. Install bond breaker tape where indicated and where required by the manufacturer's recommendations to ensure that liquid applied sealants will perform as intended.

F. Thoroughly and completely mask joints where appearance of sealant on adjacent surfaces would be objectionable.

G. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

H. Install liquid applied sealant to depths as shown or, if not shown, as recommended by the sealant manufacturer but within the following general limitations, measured at the center section of beads.

I. Equipment:
1. Apply sealant under pressure with power-actuated or hand gun or other appropriate means.
2. Use guns with nozzle of proper size, providing sufficient pressure to completely fill joints as designed.

J. For sidewalks, pavements 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 joint width, but neither more than 5/8" deep not less than 3/8" deep.

K. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.

L. Do not allow sealants or compounds to overflow from confines of joints, or to spill onto adjoining work, or to migrate into voids of exposed finishes. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

3.4 SCHEDULE OF SEALANT APPLICATION

A. Exterior Doorframe perimeters and Window Frame perimeters, interior and exterior masonry joints: Single component Modified Polyurethane.

B. Exterior Concrete Sidewalk paving, Expansion Joints, Concrete expansion joints, and joints of dissimilar materials subject to pedestrian traffic: Single Component Self-Leveling Polyurethane.

C. Exterior Joints of metal siding, exposed metal trim, metal roofing panels, metal gutters and downspouts: Single Component Silicon Rubber.

D. Interior Joints of dis-similar materials including trim, gypsum wallboard joints, doors and windows: Single component Silicone Acrylic Latex

E. Interior Wet Areas: One part, mildew resistant silicone rubber conforming to ASTM C920 types class 25 grade NS.

F. Interior and Exterior Portland Cement Concrete Paving Joints subject to Vehicle traffic: Multi Component polyurethane

3.5 CLEANING UP

A. Remove masking tape immediately after joints have been tooled.

B. Clean Adjacent surfaces free from sealant as installation progresses, using solvent or cleaning agent sealant manufacturer recommends.

3.6 CURE AND PROTECTION

Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Replace or restore sealants which are damaged or deteriorated during construction period.

PART 4 – LEED SUSTAINABLE REQUIREMENTS

4.1 LEED GOALS – APPLICABLE CREDITS

A. LEED 2009 NC – IEQ Credit 4.1

B. Low VOC
1. Minimize use of sealants, caulks, and adhesives through proper detailing, including adequate overhangs and eaves, flashing, and proper lapping of building paper and trim.
2. Use oakum to seal around penetrations where feasible.
3. Use dry adhesive sealant tape instead of wet sealants where feasible.

4.2 CONTRACTOR DOCUMENTATION REQUIREMENTS

A. Provide a cut sheet and/or material safety data sheet for every sealant used within the building (not including the exterior surface of the building), with VOC levels highlighted.

4.3 SPECIAL REQUIREMENT

A. Waste Management
1. Separate waste in accordance with the Waste Management Plan.
2. Close and seal tightly all partly used sealant containers and store protected in well-ventilated, fire-safe area at moderate temperature.
3. Place used sealant tubes and containers in areas designated for hazardous materials.

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Painting and finishing exterior and interior exposed surfaces of items provided under other Sections that are not factory-finish coated.

B. Related Work in other Sections: Priming or priming and finishing of certain surfaces may be specified to be factory performed or installer performed under other Sections.

C. Work not included:

1. Unless otherwise indicated, painting is not required on surfaces in concealed areas and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces, and duct shafts.
2. Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials will not require painting under this Section except if specified.
3. Do not paint moving parts or operating units, mechanical or electrical parts such as valve operators, linkages, sensing devices, and motor shafts, unless otherwise indicated.
4. Do not paint over required labels or equipment identification, performance rating, name, or nomenclature plates.
5. Do not paint concrete that has been sandblasted.

D. Definitions: "Paint," as used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.2 QUALITY ASSURANCE

A. Paint coordination:

1. Provide finish coats compatible with prime coats actually used.
2. Review other Sections of these Specifications as required, verifying prime coats to be used and assuring compatibility of total coating system for various substrata.
3. Upon request, furnish information on characteristics of specific finish materials to assure that compatible prime coats are used.
4. Provide barrier coats over non-compatible primers, or remove primer and reprime as required.
5. Notify Architect in writing of anticipated problems in using specified coating systems over prime coatings supplied under other Sections.

1.3 SUBMITTALS

A. Product data:

1. Submit materials list of items to be provided under this Section if substitutions are proposed. If specified products are used, submittal is not required. Key material list to Articles of this Section.
2. Manufacturer's specifications and other data needed to prove compliance with specified requirements.
3. Color and finish selection kits.

1.4 JOB CONDITIONS

A. Do not apply solvent-thinned paints when temperature of surfaces to be painted and surrounding air temperatures are below 45 degrees F, unless manufacturer's printed instructions permit otherwise as approved by Architect.

B. Weather conditions:
   1. Do not apply paint in snow, rain, fog, or mist; when relative humidity exceeds 85%; to damp or wet surfaces, unless manufacturers' printed instructions permit otherwise as approved by Architect.
   2. Paint shall not be applied when air temperature at application location is lower than 45 degrees Fahrenheit within 24-hours of the application.

PART 2 - PRODUCTS

2.1 COLORS AND FINISHES

A. General:
   1. Paint colors, surface treatments, and finishes, are indicated in schedules of the contract documents.
   2. Use representative colors when preparing samples for review.
   3. Final acceptance of colors will be from samples applied on the job.

B. Color Pigments:
   1. Pure, non-fading, applicable types to suit substrates and service indicated.
   2. Paint shall contain no lead.

C. Paint Coordination: Provide finish coats which are compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify the Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

2.2 MATERIAL QUALITY

A. Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not acceptable.

B. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.

C. Federal Specifications establish minimum acceptable quality for paint materials. Provide written certification from paint manufacturer that materials provided meet or exceed these minimums.

D. Manufacturer's products which comply with coating qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to the Architect. Furnish material data and manufacturer's certificate of performance to the Architect for any proposed substitutions.

E. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

F. Insofar as practicable, use undercoat, finish coat, and thinner material as parts of unified system of paint finish.

2.3 COLOR SCHEDULES

A. Interior and Exterior of Windows, Doors, Frames, Trim, Mouldings, and Siding: Match Benjamin Moore, color 2160-60 Kansas Grain.

2.4 APPLICATION EQUIPMENT

A. For application of approved paint, use only such equipment recommended for application of particular paint by manufacturer and as approved by Architect.

B. Prior to use of application equipment, verify that proposed equipment is actually compatible with material to be applied and that integrity of finish will not be jeopardized by use of proposed equipment.

2.5 OTHER MATERIALS

A. Contractor selects other materials, not specifically described but required for complete and proper installation, subject to Architect's approval.

B. Chemicals for On-Site Paint Stripping: Provide water based chemical stripping agent that is 100% biodegradable, pH neutral, zero VOC, and safe to use on wood, brick, stone, concrete, plaster, metal, plastic, glass, or fiberglass. Stripper product shall be capable of removing multiple layers of oil paint, latex paint, acrylics, varnishes, epoxies, urethanes and elastomerics. Product shall not require the use of a neutralizer after stripping is finished. Chemical stripper shall be "SmartStrip" by Peel-Away, a Dumond Chemical company, or approved equal.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 MATERIALS PREPARATION

A. General:
   1. Mix and prepare paint materials in strict accordance with manufacturer's recommendations as approved by Architect.
   2. When materials are not in use, store in tightly covered containers.
   3. Maintain containers used in storage, mixing, and application of paint in clean condition, free from foreign materials and residue.

B. Stirring:
   1. Stir materials before application, producing mixture of uniform density.
   2. Do not stir into material any film that forms on surface, but remove film and, if necessary, strain material before using.

3.3 SURFACE PREPARATION

A. Manufactured items: Follow printed instructions of manufacturer of item being finished.

B. General:
   1. Prepare and clean in strict accordance with paint manufacturer's recommendations as approved by Architect.
   2. Remove removable items that are in place and not scheduled to receive paint finish, or provide surface applied protection prior to surface preparation and painting operations.
   3. Following completion of painting in each space or area, reinstall removed items by using

workmen skilled in necessary trades.

4. Clean each surface to be painted prior to applying paint or surface treatment.
5. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200 degrees F, prior to start of mechanical cleaning.
6. Schedule cleaning and painting so that dust and other containments from cleaning process will not fall onto wet, newly painted surfaces.

C. Paint Stripping of In-place Material: Where indicated in the Contract Documents for the existing surface to be stripped of existing paint finishes, the Contractor shall strip all finishes to expose 100% of the existing substrate material with no remaining residue. The stripping process shall be accomplished using plastic scraping tools and chemical stripping agents in compliance with the stripping chemical manufacturer's instructions. Metal scrapers shall not be used. The stripping operation shall not damage the substrate material in any manner including gouging, raising the grain of wood substrates, or staining.

1. Mock-Up: Prior to initiating the paint stripping process on the entire project, the Contractor shall strip the existing paint finishes from (1) representative location on the project to demonstrate the Contractor's ability to produce satisfactory results acceptable to the Architect, Owner and Historical Trust. The approved mock-up shall be the standard for acceptance of the work of the contract.
2. Protection of Existing Improvements: Provide masking and protection of existing finishes and improvements from the paint stripping processes. Cover and protect existing furniture, finishes and equipment from contamination and/or damage due to paint removal operations, paint application, and other work. Do not allow paint stripping chemicals to migrate onto the floor, or other finished surfaces that are not part of the stripping scope of work.

D. Preparation of wood surfaces:

1. Clean wood surfaces until free from dirt, oil, and other foreign substance.
2. Smooth finished wood surfaces exposed to view, using appropriate sandpaper. Where required, use varying degrees of coarseness in sandpaper to produce uniformly smooth and unmarred wood surface.
3. Unless Architect specifically approves, do not proceed with painting of wood surfaces until moisture content of wood is 12% or less as measured by moisture meter approved by Architect.

3.4 PAINT APPLICATION

A. General:

1. Provide masking and protection of existing finishes and improvements from the paint application processes.
2. Touch-up damaged shop-applied prime coats, and touch-up bare area prior to applying finish coats.
3. **Slightly vary color of succeeding coats. Do not apply additional coats until completed coat has been inspected and approved coats of paint will be considered in determining number of coats applied.**
4. Sand and dust between coats to remove defects visible to unaided eye from distance of five feet.
5. On removable panels and hinged panels, paint back sides to match exposed sides.
6. Comply with printed instructions of manufacturer of factory-manufactured items.
7. **Roller application is acceptable only on gypsum wall board or plaster wall and ceiling surfaces. All woodwork and other surfaces are to be brushed or sprayed only.**

B. Drying:

1. Allow sufficient drying time between coats, modifying period as material manufacturer

recommends, to suit adverse weather conditions.

2. Consider oil-base and oleo-resinous solvent-type paint as dry for recoating when point feels firm, does not deform or feel sticky under moderate thumb pressure, and applying another coat of paint does not cause undercoat to lift or lose adhesion.

C. Brush applications:
   1. Brush out and work brush coats onto surface in even film.
   2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections are not acceptable.

D. Spray application:
   1. Where spray application is used, apply each coat to provide hiding equivalent of brush coats.
   2. Do not double back with spray equipment to build up film thickness of two coats in one pass.

3.5 COMPLETION AND CLEANING

A. Non-painted surfaces, including glass, are to be scraped clean of excess paint and putty applied as part of Work of this Contract.

B. Window sashes that operated before painting are to be operable at conclusion of Work.

3.6 PRODUCT AND SURFACE SCHEDULE

Provide following paint finishes as manufactured by the Sherwin Williams Paint company or approved equals. Substitutions submitted for approval shall include a comparison of the specified product with the substitute product.

Exterior Wood Surfaces:

Semi Gloss Finish
Primer: Sherwin Williams Exterior Oil Based Wood Primer
Finish: (2) Coats of Pro-Industrial DTM Acrylic Semi Gloss

Concrete Surfaces:

Match community mural paint finish and colors; TBD in field.
Primer: Sherwin Williams LOXON Concrete & Masonry Primer / Sealer
Finish: (2) Coats of Pro-Industrial DTM Acrylic; finish to match community mural

END OF SECTION

SECTION 12 93 00
SITE FURNISHINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Site furnishings of the following types:
   1. Benches.

1.2 RELATED SECTIONS

A. Section 03 30 00 - Cast-in-Place Concrete

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00 – Submittal Procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Detail drawings.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.

C. Shop Drawings: Indicate materials, dimensions, tolerances, welding, fasteners, hardware, mounting, finish, and accessories. Include manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum five years experience in producing site furnishings of the type specified.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handle materials to avoid damage.

1.6 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.7 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's standard warranty against defects in materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Belson Outdoors, LLC, 627 Amersale Drive, Naperville, IL 60563 – (630) 897-8489. www.belson.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01 25

00 - Substitutions.

C. Or approved equal.

2.2 SITE FURNISHINGS

A. Benches:
1. Commercial Steel Outdoor Flat Bench:
a. Model CBPB-6NB-BK, Slat steel flat bench with raised armrests, 6 feet, anchored to concrete with expanding masonry anchors set in epoxy.
2. Center Arm Accessory:
a. Model CBPB-6NBA-BK, Raised center arm divider bolted to steel bench.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

A. Install site furnishings in accordance with manufacturer's installation instructions and in proper relationship with adjacent construction. Adjust until satisfactory results are achieved.

B. Install site furnishings level, plumb, square, accurately aligned, correctly located per drawings, and without warp. Use hardware and fasteners acceptable to manufacturer.

3.3 CLEANING AND PROTECTION

A. Clean in accordance with manufacturer's recommendations.

B. Protect installed products until completion of project.

C. Touch-up, repair or replace damaged products and finishes in accordance with manufacturer's instructions before Substantial Completion.

END OF SECTION

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide all labor, material, appliances and equipment, and do all earthwork necessary for installation and completion of Work, including sheeting, shoring, underpinning, excavation, fill and backfill for footings, piers, slabs, including earth fill, and rough grading around buildings and in grounds as indicated on Drawings, finish grading of subgrades and removal and disposal of all excess and unsuitable material and debris, all in accordance with Drawings and as specified herein. Perform all earthwork for pipes and other utilities. All excavation, whether it be earth, rock or any other material, is included in contract.
The extent of earthwork is further indicated on the drawings and includes, but is not limited to the following:
8. Excavation and backfill associated with storm drainage water retention structures.

B. Contractor accepts site in condition in which it exists at award of Contract.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Perform excavation work in compliance with applicable requirements of all governing authorities having jurisdiction.

B. Testing and Inspection: The Contractor shall engage soil testing and inspection service for quality control testing during earthwork operations.

1.3 JOB CONDITIONS

A. Site Information: Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil bearings. It is expressly understood that the Owner shall not be responsible for interpretations or conclusions drawn therefrom by the Contractor. The data is made available for the convenience of the Contractor.

B. Existing Utilities:
1. The Contractor shall locate existing underground utilities in the areas of the work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
2. The Contractor shall demolish and completely remove from the site, existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

C. Use of Explosives: The use of explosives is prohibited.

D. Protection of Persons and Property:
1. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as required by authorities having jurisdiction.
2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.4 SOIL QUANTITIES AND SOURCES

A. The term "cut", as it relates to this section, is defined herein as an area of excavation necessary to remove existing, undisturbed, classified soils, in order to lower the existing grade elevation to the proposed, new subgrade elevation.

B. The term "fill", as it relates to this section, is defined as an area that requires layers of appropriately classified soils to be added over the existing subsoil in order to raise the existing grade elevation to the proposed, new elevation.

C. The term "backfill", as it relates to this section, is defined as fill material required to fill-in a depression in the topography created by excavation, trenching, or the removal of a subterranean structure, foundation, or footing.

D. The Contractor shall be responsible for supplying all soils materials required to execute the work of the contract at the Contractor's own cost.

E. The soils required for areas of fill and backfill shall be obtained by the Contractor from a combination of on-site areas of cut that contain appropriately classified soil material, and appropriately classified soils obtained from approved sources off the site, all at the Contractor's own expense.

F. The Contractor shall not rely on grading cut and fill quantities indicated on the drawings. Any soil or earth quantities listed on the drawings are provided solely for the purpose of the Grading Permit application process.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Definitions:

1. Satisfactory soil materials for controlled fill are defined as primarily granular complying with ASTM D2487 soil classification groups SM, or better, free of organic matter, man-made debris and fragments of rock larger than four inches.
2. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

B. Soil Materials:

1. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100% passing a 1-1/2" sieve and not more than 5% passing a No. 4 sieve. Overall Performance of porous fill shall consist of granular material that will compact sufficiently to support construction traffic and allow downward and lateral migration of moisture.
2. Backfill and Fill Materials:
   a. Satisfactory soil materials free of clay, rock or gravel larger than 4" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.
   b. Fill material is subject to Architect's approval, and is material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soils free from roots and other deleterious matter.

C. Topsoil: Where and if shown on Drawings or otherwise required, provide topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to region, capable of sustaining healthy plant life, and reasonably free from subsoil, roots, heavy or stiff clay, stones larger than 2" in greatest dimension, noxious weeds, sticks, brush, litter, and other deleterious matter.

PART 3 - EXECUTION

3.1 EXCAVATION CLASSIFICATIONS

A. Earth Excavation:

1. Earth excavation includes excavation of pavements and other obstructions visible on the ground surface; underground structures, utilities and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.
2. Earthwork excavation costs shall be included in the Contractor's base bid.

B. Rock excavation:

1. Rock excavation includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 3/4 cubic yard capacity, 42" wide bucket on track mounted power excavator equivalent to a Caterpillar Model 215, rated at not less than 90 horsepower flywheel power and 30,000 lb. drawbar pull. Typical of materials classified as rock are boulders 1/2 cubic yard or more in volume, solid rock, rock in ledges, and rockhard cementitious aggregate deposits.
2. The Contractor shall not perform rock excavation work until the material to be excavated has been cross sectioned and classified by the Architect.
3. Rock excavation shall be paid on the basis of the contract conditions relative to changes in the work. Rock excavation, and payment for rock excavation, shall be limited to the following lines:
   a. Two feet outside of concrete work for which forms are required, except footings.
   b. One foot outside the perimeter of footings.
   c. In pipe trenches, 6" below invert elevation of pipe and 2 feet wider than inside diameter of pipe.
   d. Under slabs on grade, 6" below bottom of concrete slab.

C. Unauthorized Excavation:

1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.
2. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to the Architect.

D. Additional Excavation:

1. When excavation has reached required subgrade elevations, notify the Geotechnical Engineer who will make an inspection of the conditions. If unsuitable bearing materials are encountered at the required subgrade elevations, carry excavations deeper and replace excavated material as directed by the Geotechnical Engineer.
2. Removal of unsuitable material and its replacement as directed by the Architect, shall be paid on the basis of the contract conditions relative to changes in the work.

3.2 EXCAVATIONS; GENERAL REQUIREMENTS

A. Contractor shall do all excavation of every description and in whatever material encountered to lines and grades as Drawings indicate. Excavation may be accomplished by any customary method. Shoring as hereinafter specified shall be furnished and maintained as required to assure safety of all workmen and to insure stability of all adjacent buildings, utilities, paving, etc. Care shall be exercised that excavations are not carried below foundations, lines, or other required limits through errors. Such excess excavation shall be backfilled with concrete for

height of footings or walls increased at expense of Contractor.

B. It is not anticipated that rock will be encountered within excavation limits. Blasting will not be permitted.

C. All excavation work shall be inspected by an independent Geotechnical Engineer appointed and paid for by the Contractor, before any concrete is poured, or structures or paving are constructed.

D. All excavations, for whatever purpose, shall be carried to depth shown on Drawings, or deeper, as Geotechnical Engineer requires.

E. Take great care to determine location of all adjacent utility lines before proceeding with excavation. Any utilities, structures, paving, etc., disturbed by work under this Contract must be repaired or replaced in a manner acceptable to proper authorities entirely at Contractor's expense.

F. All excavations shall be kept free of water. Provide temporary drainage until permanent drainage is in place. Exercise care to prevent nuisance to neighboring properties by uncontrolled drainage.

G. Footings and Foundations: Bottoms of footings and wall trenches shall be perfectly level, except they shall be "Stepped" where indicated or as required by excavation for mechanical frames, and excavated to neat lines shown on Drawings. Excavation shall extend a sufficient distance from walls and footings to allow for forms, installation of drain tile, waterproofing and for inspection. After completion of excavation, prior to commencement of foundation footings, floor or slab construction, Geotechnical Engineer shall inspect excavation. Contractor must notify Geotechnical Engineer in ample time to permit proper inspections.

H. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 40 degrees F.

3.3 EXCAVATIONS FOR STRUCTURES

A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.

B. In excavating for footings and foundations, do not disturb the bottom of the excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.4 EXCAVATIONS FOR PAVEMENTS

A. Cut surface under pavements to comply with cross sections, elevations and grades as shown on the drawings.

3.5 EXCAVATIONS FOR TRENCHES

A. Excavate trenches to the depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations. Beyond building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze-ups.

B. For pipes or conduit 5" or less in nominal size and for flat bottomed multiple duct conduit units, do not excavate beyond the indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.

C. For pipes or conduit 6" or larger in nominal size, tanks and other mechanical/electrical work indicated to receive subbase, excavate to subbase depth indicated, or, if not otherwise indicated, to 6" below bottom of work to supported.

D. Except as otherwise indicated, excavate for exterior water bearing piping (water, steam, condensate, drainage) so top of piping is not less than 4 feet below finished grade.

E. Grade the bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.

F. Backfill trenches with concrete where trench excavations pass within 18" of column or wall footings and which are carried below bottom of such footings, or which pass under wall footings. Place concrete to the level of the bottom of the adjacent footing.

G. Do not backfill trenches until tests and inspections have been made and backfilling authorized by the Architect.

H. For piping or conduit that is installed less than 2'-6" below the surface of roadways, provide a 4" thick continuous concrete base slab support. After installation and testing of piping or conduit, provide minimum 4" thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.

3.6 STABILITY OF EXCAVATIONS

A. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

B. If the sides of excavations cannot be sloped, provide suitable shoring and bracing which will support loads imposed. Shoring and bracing materials need not be new, but shall be in serviceable condition. Maintain shoring and bracing in excavations as long as the excavation remains open. Carry down shoring and bracing as excavation progresses.

3.7 DEWATERING AND PROTECTION OF EXPOSED SUBSOILS

A. If the existing shallow soils are subjected to high moisture contents during construction, heavy equipment, including compaction equipment, will create a general deterioration of the existing soils. Contractor shall employ all means necessary to protect existing soils from water /moisture infiltration in the areas of new structures.

B. The Contractor shall protect all soils exposed by clearing and excavation operations, from becoming un-stable, or un-acceptable for placing fill, or un-acceptable for compaction due to water saturation from rain or any other source. The Contractor shall minimize the disturbance of soils below the subgrade elevation of all building slabs. The Contractor shall bear the cost of any remedial action necessary to restore soils to a stable, acceptable condition, including, but not limited to, removal of un-satisfactory soils and replacement with satisfactory soils or stone fill. Confirmation of an acceptable soil condition shall be provided by a geotechnical engineer before the Contractor commences earthwork operations. Un-acceptable soil conditions shall be inspected by a geotechnical engineer prior to removal and replacement with new material.

B. Not more than (14) days prior to commencing the excavation of undisturbed soils that are intended to be used for fill elsewhere on the site, the Contractor shall engage a geotechnical engineering and testing agency to perform subsurface testing of the on-site soils for the purpose of determining the moisture content and soil classification. A report of findings shall be transmitted to the Architect prior to commencing the excavation.

C. The Contractor shall implement action to protect exposed subsoils from becoming saturated with water immediately upon the removal of the surface topsoil. Protection shall include, but is not limited to, covering all exposed subsoils with a waterproof tarp and temporarily shaping the surface of the soil to create positive drainage toward erosion control and storm water management structures.

D. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to the stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

3.8 MATERIAL STORAGE

A. Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage. Cover stockpile with tarps at all times.

B. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.

C. Dispose of excess soil material and waste materials off-site at Contractor's expense.

3.9 CONTROLLED COMPACTED FILL AND BACKFILL

A. General

1. All fill and back fill shall be "Controlled and Compacted Fill" as described hereafter. Material shall be approved by Geotechnical Engineer.
2. Controlled fill shall be placed in level lifts, eight to nine inches in loose thickness, and compacted to the following minimum percentages of its Modified Proctor maximum dry density as established by ASTM D-1557 specifications.
   95 percent within the upper twelve inches of pavement subgrade
   92 percent under the floor slab and pavements (below the upper twelve inches of subgrade)
   When Material varies from optimum moisture content it shall be watered or dried as necessary.
3. Geotechnical Engineer approves all fill material, equipment, and techniques prior to beginning filling operations.
4. Limits of removal of existing unsuitable fill and areas of controlled fill and backfill shall be limited to building and 10 feet beyond perimeter of each building. All unsuitable material shall be removed to underlying natural soils of suitable bearing capacity. Proof roll and compact to 95% density.
5. No rocks or boulders larger than 4" in dimension shall be placed in fill or backfill.

B. Materials for Fill and Backfill

General: Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below:

1. In excavations: Use satisfactory excavated or borrow material.
2. Under Lawns: Use satisfactory excavated or borrow material.
3. Under Walks and Pavements: Use subbase to the required depth and satisfactory excavated or borrow material below the subbase.
4. Under Steps: Use the subbase material to the required depth and satisfactory excavated or borrow material below the subbase.
5. Under Building Slabs: Use drainage fill material to the depth indicated and satisfactory excavated or borrow material below the drainage course.

6. Under Piping and Conduit: Use subbase material where subbase is indicated under piping or conduit; shape to fit bottom 90 degrees of cylinder.
7. Trench backfill: satisfactory excavated or borrow material.

3.10 PREPARATION

A. Backfill of Excavations: Backfill excavations as promptly as work permits, but not until completion of the following:
   1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
   2. Inspection, testing, approval, and recording locations of underground utilities.
   3. Removal of concrete formwork.
   4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structures or utilities, or leave in place if required.
   5. Removal of trash and debris.
   6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

B. Ground Surface Preparation
   1. Before depositing fills, the ground surface shall be cleared of all refuse, brush, grass, roots, ice and frozen material. All organic matter and otherwise unsuitable soils shall be removed from the surface to be filled. The exposed surface shall be plowed or scarified if required to a depth of six inches. Soils so scarified, or which have been disturbed by grubbing and stripping operations, shall be compacted to undisturbed soil below by discing, leveling, rolling and compacting at the moisture content and to the density specified.
   2. Within the proposed building addition area, strip the topsoil and any soft or otherwise unsuitable materials to expose stable conditions.
   3. Proof roll the stripped surface to a uniformly dense condition, further cutting out any soft or otherwise weakened spots and replacing with controlled fill.
   4. Fill the designated area with controlled fill to achieve plan subgrade. The fill construction shall be accordance with COMPACTED FILL.

3.11 PLACEMENT

A. Controlled fill shall have a moisture content within +/- 2 percentage points of its corresponding moisture-density relationship optimum moisture content. Borrow soils at this site require minor moisture adjustment (drying) prior to placement as fill at contractor's expense.

   The density of the fill shall be checked in each lift by an experienced soils technician. Should utility construction be performed after earthwork, the Contractor shall be responsible for achieving 95 or 92 percent compaction (where appropriate) of the Modified Proctor maximum dry density in all trench backfill.

   For proofrolling and fill compaction operations, fill limits shall be extended at least 10 feet beyond building exterior walls and pavement boundaries.

   A sufficient number of in-place density tests shall be performed by an engineering technician to verify that the proper degree of compaction is being obtained on all fill soils. As a minimum, each lift shall be tested and one test per 2500 square feet shall be performed.

B. Place backfill and fill materials in layers not more than 8" in loose depth for material compacted using heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand operated tampers.

C. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

D. Place backfill and fill materials evenly adjacent to structures, piping conduit to required elevations. Take action to prevent wedging of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

3.12 COMPACTION

A. Structures, Building Slabs, Steps, Ramps, and Pavements, Trenches:
   1. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to not less than 95% of the maximum dry density as determined by ASTM D 1557.
   2. The moisture content of the fill shall be as required in order to attain the degree of compaction specified.
   3. Compaction shall be accomplished using approved multiple-wheel pneumatic tired rollers, vibratory roller or other types of acceptable rollers.

B. Lawn or Unpaved Areas: Compact top 6" of subgrade and each layer of backfill or fill material at 85% maximum density for cohesive soils and 90% relative density for cohesionless soils.

C. Moisture Control: Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Use of drying agents is subject to approval of Geotechnical Engineer.

3.13 GRADING

A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.

B. Grading Outside Building Lines: Grade areas adjacent to the building lines to drain away from the structure and to prevent ponding. Finish surfaces free from irregular surface changes, and as follows:
   1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 feet above or below required subgrade elevations.
   2. Walks: Shape surface of areas under walks to line, grade and cross section, with finish surface not more than 0.10 feet above or below required subgrade elevation.
   3. Pavements: Shape surface of areas under pavement to line, grade and cross section, with finish surface not more than 1/2 inch above or below required subgrade elevation.

C. Grading Surfaces of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2 inch when tested with a 10 foot straightedge.

D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.14 PAVEMENT SUBBASE COURSE

A. General: Subbase course consists of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course.

B. Grade Control: During construction, maintain lines and grades including crown and cross slope of subbase course.

C. Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12" width of shoulder simultaneously with compacting and rolling of each layer of subbase course.

D. Placing:
   1. Place subbase course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.
   2. When a compacted subbase course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.15 BUILDING SLAB DRAINAGE COURSE

A. General: Drainage course consists of placement of drainage fill material, in layers of indicated thickness, over subgrade surface to support concrete building slabs.

B. Placing:
   1. Place drainage fill material on prepared subgrade in layers of uniform thickness, conforming to indicated cross section and thickness. Maintain optimum moisture content for compacting material during placement operations.
   2. When a compacted drainage course is shown to be 6" thick or less, place material in single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.16 SITE INSPECTION

A. An independent Geotechnical Engineer, appointed and paid by Contractor, shall be on site during excavations and backfill operations. No footings or slabs shall be poured until Testing Agency certifies that material compacted is acceptable.

B. If material or compaction fails to meet Contract requirements, remove fill to approved depth and replace in accordance with Specifications. Contractor shall pay cost of additional work.

C. It shall be Contractor's responsibility to notify Geotechnical Engineer of anticipated operations, so that they can schedule required field trips.

D. Allow testing service to inspect and approve subgrades and fill layers before further construction work is performed.

E. If, in the opinion of the Architect, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense to the Owner.

3.17 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to the satisfaction of the Owner.

3.18 DISPOSAL OF EXCESS AND WASTE MATERIALS

Remove waste material, including unacceptable excavated material, trash and debris, and dispose of it off-site at a site approved for disposal by governing agencies.

END OF SECTION

SECTION 33 42 36
STORMWATER TRENCH DRAINS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Trench Drains

B. Ornamental Ductile Iron Grates

1.2 RELATED SECTIONS

A. Section 03 30 00 - Cast-in-Place Concrete

B. Section 31 20 00 - Earth Moving

C. Section 33 49 23 - Storm Drainage Water Retention Structures

1.3 REFERENCES

A. American Disabilities Act (ADA).

B. ASTM International (ASTM):
1. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
2. ASTM C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
3. ASTM C1202 - Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.

C. The European Committee for Standardization (CEN):
1. EN 1433 - Drainage channels for vehicular and pedestrian areas. Classification, design and testing requirements, marking and evaluation of conformity.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00 – Submittal Procedures.

B. Product Data:
1. Manufacturer's data sheets on each product to be used.
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Typical installation methods.

C. Verification Samples: Two representative units of trench drain, including grate.

D. Shop Drawings: Include details indicating layout, dimensions, materials, components, and accessories. Include relationship with adjacent construction.

E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

F. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum ten years documented experience.
   1. Manufacturer's Project References: List of successfully completed drainage channel system projects, including project name and location, name of architect, and type and quantity of drainage channel systems furnished.

B. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience with projects of similar scope and complexity.
   1. Installer's Project References: List of successfully completed drainage channel system projects, including project name and location, name of architect, and type and quantity of drainage channel systems installed.
   2. Employ persons trained for installation of drainage channel systems.

C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
   1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
   2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
   3. Retain mock-up during construction as a standard for comparison with completed work.
   4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.6 PRE-INSTALLATION CONFERENCE

A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved.

B. Agenda Shall Include:
   1. Materials.
   2. Schedule.
   3. Responsibilities.
   4. Critical path items
   5. Approvals.
   6. Installation.
   7. Adjusting.
   8. Cleaning.
   9. Protection.
   10. Coordination with other Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
   1. Keep materials in manufacturer's original, unopened containers and packaging until installation.
   2. Store materials in clean areas, protected from exposure to harmful weather conditions.

3. Store materials out of direct sunlight.

C. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

B. Cold Weather:
1. Do not use frozen materials.
2. Do not use materials mixed or coated with ice or frost.
3. Do not build on frozen Work.

C. Wet Weather: Do not build on wet, saturated, or muddy subgrade.

1.9 WARRANTY

A. Manufacturer's standard limited warranty unless indicated otherwise.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. ABT, Inc., 259 Murdock Road, Troutman, NC - (800) 438-6057. www.abtdrains.com

B. Iron Age Designs, 2104 SW 152nd St #4, Burien, WA – (206) 276-0925. www.ironagegrates.com

C. Or approved equal.

D. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 - Substitutions

2.2 TRENCH DRAINS

A. Precast Polyester Polymer Trench Drain: Standard PolyDrain – Precast, Prelsloped 4" I.D. trench drain as manufactured by ABT, Inc.
a. The precast trench drain shall be manufactured using polyester polymer concrete with the following material properties when tested:

Property	**Test Method**	**Value**
Compressive Strength	ASTM C579	14,000 psi Minimum
Bending Strength	ASTM C580	4,000 psi Minimum
Tensile Strength	ASTM C307	2,000 psi Minimum
Moisture Absorption	ASTM D570	0.1% Maximum
Chemical Resistance	ASTM C267	Pass
Freeze/Thaw w/o weight loss	ASTM C666	1,600 # of Cycles Min.
Resistance to Fungi	ASTM G21	Zero (0) Rating Growth
UL/ULC Listed- Flame Spread	UL-723	Class A

b. The trench consisting of 39.19" (1 meter) or 19.56" (1/2 meter) channels with nominal 6" (155mm) outside width, 4 " (100mm) inside width. Pre-sloped channels shall have a standard slope of 0.6% with radius bottom. Non-sloping channels must have written approval by engineer prior to installation. Channels shall have tongue and groove joints. Grate lock down

slots shall have polyethylene vibration dampening inserts. All channels must have full length anchoring ribs for a positive mechanical lock with the surrounding concrete.

B. Ornamental Iron Grate: Locust Trench Grate (Series Number: LA5-20I21) as manufactured by Iron Age Grates.
   a. Ductile Iron per ASTM A536-84 Grade 80-55-06
   b. Load Rating: 494 PSI (AASHTO M-306 Test method)
   c. Baked on Oil Finish
   d. 2811B Hold-Down devices for ABT POLYDRAIN Ductile Iron Grate
   e. Or approved equal

2.3 EXAMINATION

A. Do not begin installation until substrates have been properly constructed and prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

2.4 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2.5 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

B. Excavate trenches to ensure proper thickness of concrete beneath and on both sides of channels are maintained and are in accordance with specified load rating.

C. Install drainage channel system to elevations and slopes indicated on the Drawings.

D. Ensure directional flow arrows located on channels are pointing in direction of flow, toward catch basins and evacuation outlets.

E. Install catch basins at elevations indicated on the Drawings.

F. Apply silicon sealant to make joints watertight.

G. Install temporary blank grate inserts to keep concrete, sediment, and debris out of channel drains during installation of drainage channel system.

H. Concrete:
   1. Place concrete beneath and on both sides of drainage channel system in accordance with specified load rating and as indicated on the Drawings.
   2. Concrete: Specified in Section 03 30 00.

I. Recess Top of Drainage Channel System:
   1. Pedestrian Applications: 1/8 inch below concrete finish grade.

J. Allow concrete to cure to specified compressive strength.

K. Ensure sediment and debris does not collect in drainage channel system.

L. Install channel grates in accordance with manufacturer's instructions to meet load rating.

2.6 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.
   1. Remove and replace with new material, damaged components that cannot be successfully repaired, as determined by Architect.

B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

2.7 CLEANING AND PROTECTION

A. Clean drainage channel system of accumulated sediment and debris before final project completion.

B. Protect Work of this Section to ensure that, except for normal weathering, Work will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 33 49 23

STORM DRAINAGE WATER RETENTION STRUCTURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Storm drainage water retention structures and trench drains.

1.2 RELATED SECTIONS

A. Section 31 20 00 – Earth Moving.

1.3 SUBMITTALS

A. Comply with Section 01 33 00 - Submittal Procedures.

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating materials, components, and dimensions.

D. Warranty: Submit manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Provide storm water leaching system from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions.

C. Handling: Protect materials during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. NDS, Inc., 851 North Harvard Avenue, PO Box 339, Lindsay, California 93247. Toll Free (800) 726-1994. Toll Free Fax (800) 726-1998. Phone (559) 562-9888. Fax (559) 562-4488. Website www.ndspro.com. E-Mail nds@ndspro.com.

2.2 STORM DRAINAGE WATER RETENTION STRUCTURE

A. 24-Inch Diameter by 28.75-Inch High Flo-Well Storm Water Leaching System:
   1. Part Number: FWAS24.
   2. Description: Structural-foam polyolefin, round drywell system with UV inhibitor.
   3. Diameter: 24 inches.
   4. Height: 28.75 inches.
   5. Capacity: 49 gallons.
   6. Knockout Leaching Ports per Panel: 18, 1.5-inch diameter.
   7. Knockout Inlet/Outlet Ports per Panel: 3, 4.5-inch diameter.
   8. Color: Black.

B. 24-Inch Diameter Flo-Well Cover:
   1. Part Number: FWAS24C.
   2. Description: Structural-foam polyolefin, round drywell system cover with UV inhibitor.
   3. Diameter: 24-1/4 inches.
   4. Height: 4-5/8 inches.
   5. Outer Lip: 3/4 inch.
   6. Center Knockout: 4.5-inch diameter.
   7. Color: Black.

C. Flo-Well Side Panels/Extension Only:
   1. Part Number: FWSPS3.
   2. Description: Structural-foam polyolefin, side panels with UV inhibitor.
   3. Size: 24 inches high with recessed 0.75-inch lip.
   4. Knockout Leaching Ports per Panel: 18, 1.5-inch diameter.
   5. Knockout Inlet/Outlet Ports per Panel: 3, 4.5-inch diameter.
   6. Color: Black.

D. 24-Inch Diameter Flo-Well Bottom:
   1. Part Number: FWBP24.
   2. Description: Structural-foam polyolefin, round drywell system bottom with UV inhibitor.
   3. Diameter: 24 inches.
   4. Leaching Ports: 6, 1-1/2-inch diameter.
   5. Center Knockout for Strut Coupling: 4.5-inch diameter.
   6. Color: Black.

E. Flo-Well Fabric Wrap:
   1. Part Number: FWFF67.
   2. Description: Porous filter fabric wrap.

F. 4-inch Schedule 80 pipe.

G. Porous fill: Porous fill crushed stone or washed gravel, 1 inch maximum.

H. Or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive storm water leaching system. Notify Architect if areas are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

3.2 INSTALLATION

A. Install storm water leaching system in accordance with manufacturer's instructions at locations indicated on the Drawings.

B. Install leaching system level and to proper elevation.

3.3 PROTECTION

A. Protect installed storm water leaching system from damage during construction.

END OF SECTION

Limited Lead X-Ray Fluorescence (XRF) Survey

November 20, 2023

Mr. Scott Hartman
C&W Construction
P. O. Box 953
Abingdon, MD 21009
Delivered Via Email: shar332483@aol.com, cwconstruction1@verizon.net

RE: Limited Lead X-Ray Fluorescence (XRF) Survey
1529 East Fort Avenue, Baltimore, MD

Dear Mr. Hartman:

Adams Environmental Engineering Group, LLC (AEEG) is pleased to submit the enclosed Limited Lead X-Ray Fluorescence (XRF) Survey for the above referenced property. This assessment was limited to a pavilion in the park area.

We appreciate the opportunity to provide environmental services to you. Should you have any questions or comments regarding this report, please contact the undersigned at 443-848-2954.

Sincerely,

Cari Finch, PE, BCEE
Owner/Principal Environmental Engineer

Table of Contents

1.0 INTRODUCTION 1
1.2 Scope of Work 1
1.3 Limitations 1
2.0 SURVEY FINDINGS 1
2.1 Lead-Based Paint Survey 1
3.0 CONCLUSIONS AND RECOMMENDATIONS 2
4.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONAL 3

Appendices

Appendix A Site Photographs
Appendix B Lead Paint Laboratory Analytical Results and Chain of Custody Documentation
Appendix C Certifications

1.0 INTRODUCTION

Adams Environmental Engineering Group, LLC (AEEG) has conducted a Limited Lead X-Ray Fluorescence (XRF) Survey of a portion of the property located at 1529 East Fort Avenue in Baltimore, Maryland. Only the pavilion in the park area was assessed.

1.2 Scope of Work

The Limited Lead X-Ray Fluorescence (XRF) Survey included a lead-based paint (LBP) survey. The scope for this assessment included visual observations and sampling of suspect LBPs at the pavilion in the park area.

1.3 Limitations

This inspection and subsequent report have been prepared for CW Construction on the behalf of Baltimore City, in accordance with standard industry practices. The findings of this report are based on visual observation, information obtained during interviews with third parties and/or direct sampling and analysis. Information provided by third parties is assumed to be correct and accurate. AEEG cannot warrant the accuracy of such information. Quantities provided are not to be used for abatement bidding. It is highly recommended that the client performs in-person bid walks and include AEEG to ensure the findings of this report are conveyed accurately to any interested bidding contractors.

AEEG's inspection was limited to areas as indicated in the above report. AEEG recommends that any materials discovered at a later date which were not sampled during this limited survey be sampled prior to disturbance.

2.0 SURVEY FINDINGS

2.1 Lead-Based Paint Survey

Lead is a highly toxic metal that affects virtually every system of the body. LBP is defined as any paint, varnish, stain, or other applied coating that has 1 mg/cm^2 (or 5,000 ug/g or 0.5% by weight) or more of lead. Congress passed the Residential Lead-Based Paint Hazard Reduction Act of 1992, also known as "Title X", to protect families from exposure to lead from paint, dust, and soil. Under Section 1017 of Title X, intact LBP on most walls and ceilings is not considered a "hazard," although the condition of the paint should be monitored and maintained to ensure that it does not become deteriorated. Further, Section 1018 of this law directed the Housing and Urban Development (HUD) and the US EPA to require the disclosure of known information on LBP and LBP hazards before the sale or lease of most housing built before 1978.

On November 10, 2023, at the request of the Client, sampling of painted surfaces was conducted utilizing paint chip sampling and an XRF analyzer to test various surfaces located in the Site for the presence of lead. The survey was performed by Mr. Andrew Clark, an EPA-certified and MD-licensed Lead Inspector Technician. The survey was limited to painted components in the basement boiler room area. The survey was performed using an SciAps X-550XRF analyzer (SN: 01503). The Maryland Department of the Environment (MDE) identifies lead-based paint (LBP) as areas that exhibit lead equal to or in excess of one milligram per square centimeter (0.7 mg/cm2) or one-half percent (0.5%) by weight. Lead-containing paint are areas that exhibit detectible lead below 0.7 mg/cm2. This survey was performed in general conformance with Performance Characteristic Sheet (PCS) Approved by Housing and Urban Development (HUD). A total of 29 readings were collected in total. The following table summarizes surfaces with a coated by LBP.

READING NO.	WALL	LOCATION	COMPONENT	SUBSTRATE	CONDITION	RESULTS (mg/cm²)
005		Roof	Rafter (Yellow/White)	Wood	Deteriorated	2.5
008	D	Roof	Support Beam (Brown)	Wood	Deteriorated	3.2
009	D	Wall	Support Beam (Blue)	Concrete	Intact	2.5
010	D	Wall	Support Beam (Blue)	Concrete	Intact	0.8
011	D	Wall	Top of Wall (Dark Blue)	Concrete	Intact	3.3
013	D	Wall	Middle of Wall (Light Blue)	Concrete	Intact	1.8
016	D	Wall	Bottom of Wall (Red)	Concrete	Intact	1.5
019	A	Wall	Bottom of Wall (Blue)	Concrete	Intact	1.2
020	B	Wall	Top of Wall (Light Blue)	Concrete	Intact	1.8
022	B	Wall	Bottom of Wall (Dark Blue)	Concrete	Intact	1.2
023	B	Wall	Top of Wall (Light Blue)	Concrete	Intact	2.0
025	B	Wall	Bottom of Wall (Dark Blue)	Concrete	Intact	0.9
026	B	Wall	Bottom of Curved Wall (Dark Blue)	Concrete	Intact	0.9
027	C	Wall	Top of Wall (Light Blue)	Concrete	Intact	1.5
029	C	Wall	Bottom of Wall (Dark Blue)	Concrete	Intact	4.4

Note: Wall A refers to the wall facing the street. Walls are named B, C, D in clockwise order from Wall A in each room.

As a result of this Limited LBP Survey, LBP was identified on components within the scope area. The Limited LBP Survey did not include testing of every painted surface within the scope area. The Limited LBP Survey is intended to characterize similar components into groups. If similar components with the same color and substrate to those identified above are encountered during renovation or demolition activities, the lead content is assumed to be the same as the tested paint/component unless additional testing proves otherwise.

Conclusions and recommendations regarding lead paint are provided in Section 3.0. The laboratory analytical results and a full list of all of the samples collected are included in Appendix B of this report.

3.0 CONCLUSIONS AND RECOMMENDATIONS

A Limited Lead X-Ray Fluorescence (XRF) Survey was conducted for the property located at 1529 East Fort Avenue in Baltimore, Maryland (the "site"). LBP was identified. Based on the work conducted for this survey, AEEG concludes the following:

- LBP was identified on various components in the basement area.

Based on the above-conditions, AEEG recommends the following:

- AEEG recommends that all deteriorated LBP be abated or interim controls be implemented to stabilize and encapsulate deteriorated LBP. LBP activities with the intent to abate LBP must be performed by a Maryland-licensed abatement contract in conformance with State and Federal lead regulations.

4.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONAL

AEEG has conducted a Limited Lead X-Ray Fluorescence (XRF) Survey of the property located at 1529 East Fort Avenue, Baltimore, Maryland in general conformance with the scope and limitations of the protocol and the limitations stated earlier in this report. Exceptions to or deletions from this protocol are discussed earlier in this report.

Prepared By:

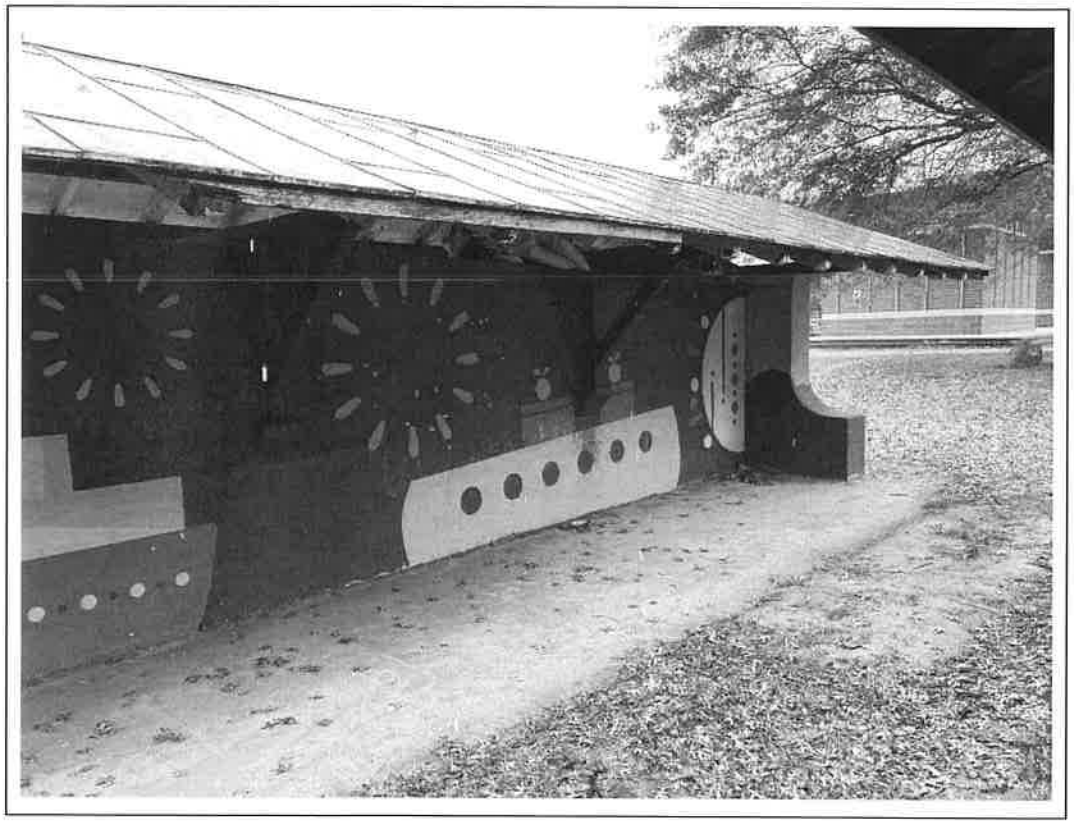
Cari Finch, PE, BCEE
Owner/Principal Environmental Engineer

APPENDIX A

Site Photographs



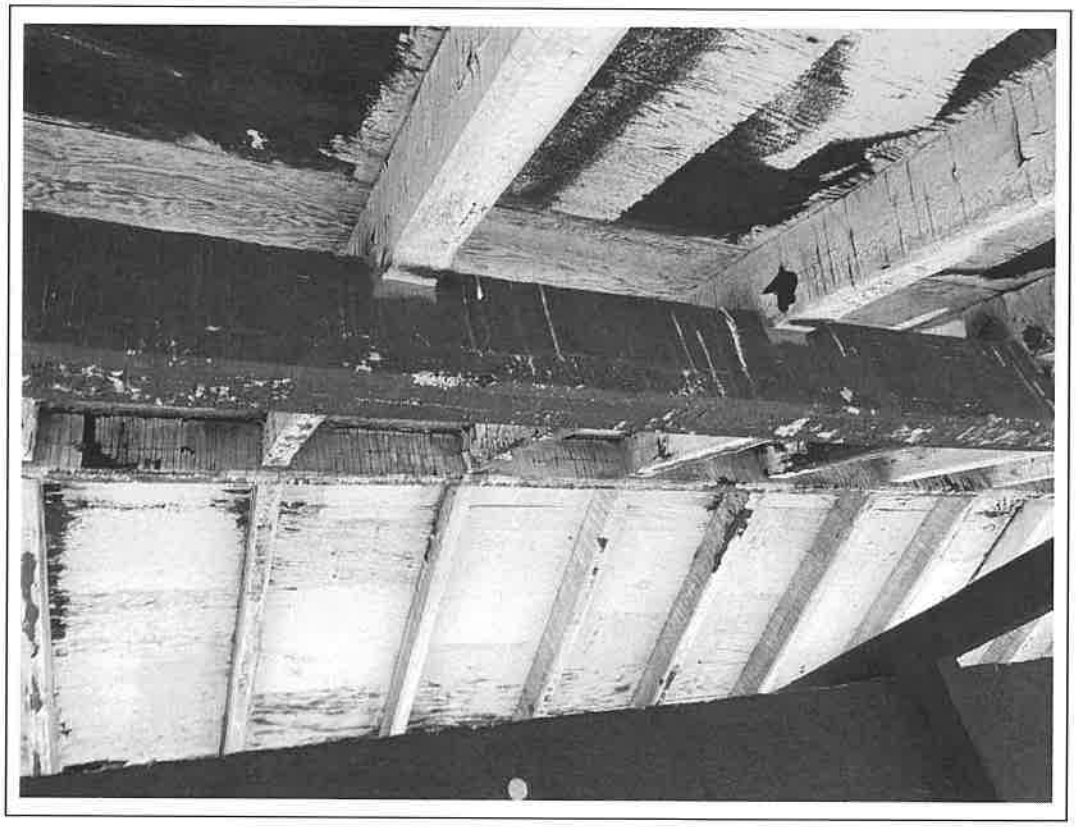
Photograph 1: View of deteriorated paint on roof rafters and deck



Photograph 2: View of paint on Wall D



Photograph 3: View of paint on Wall C



Photograph 4: View of brown support beam

ATTACHMENT B

LBP Data Sheets and Photographs

APPENDIX B

Lead Paint Laboratory Analytical Results and Chain of Custody Documentation

XRF Lead-Based Paint Testing Data Sheet

1529 E. Fort Avenue, Baltimore, MD

Inspection Date: Novemeber 10,2023 Abatement Level: 1.0
Inspector: Andrew Clark Location: Latrobe Park Field

Reading No.	Wall	Room	Component	Substrate	Paint Condition	Lead (mg/cm^2)	Mode	Classification
001		Begin 11/10/2023	Calibration			1.0	TC	Pass
002			Calibration			1.0	TC	Pass
003			Calibration			1.0	TC	Pass
004		Rafters	Roof Yellow	Wood	Deteriorated	0.0	QM	Negative
005		Rafters	Roof Yellow	Wood	Deteriorated	2.5	QM	Positive
006		Roof Deck	Roof Yellow	Wood	Deteriorated	0.0	QM	Negative
007		Roof Deck	Roof Yellow	Wood	Deteriorated	0.0	QM	Negative
008		Roof Deck	Support Beam Brown	Metal	Deteriorated	3.2	QM	Positive
009	D	Wall	Support Beam Blue	Concrete	Intact	2.5	QM	Positive
010	D	Wall	Support Blue	Concrete	Intact	0.8	QM	Negative
011	D	Wall	Top Dark Blue Paint	Concrete	Intact	1.6	QM	Positive
012	D	Wall	Top Light Blue Paint	Concrete	Intact	0.0	QM	Negative
013	D	Wall	Mid Light Blue Paint	Concrete	Intact	1.8	QM	Positive
014	D	Wall	Mid Dark Blue Paint	Concrete	Intact	0.5	QM	Negative
015	D	Wall	Btm Dark Blue Paint	Concrete	Intact	0.0	QM	Negative
016	D	Wall	Red Paint	Concrete	Intact	1.5	QM	Positive
017	D	Wall	Btm Light Blue Paint	Concrete	Intact	0.2	QM	Negative
018	A	Wall	Bottom Blue Paint	Concrete	Intact	0.2	QM	Negative
019	A	Wall	Bottom Blue Paint	Concrete	Intact	1.2	QM	Positive
020	B	Wall	Top of Wall	Concrete	Intact	1.8	QM	Positive
021	B	Wall	Middle of Wall	Concrete	Intact	0.0	QM	Negative
022	B	Wall	Bottom of Wall	Concrete	Intact	1.2	QM	Positive
023	B	Wall	Top of Wall	Concrete	Intact	2.0	QM	Positive
024	B	Wall	Middle of Wall	Concrete	Intact	0.0	QM	Negative
025	B	Wall	Bottom of Wall	Concrete	Intact	0.9	QM	Negative
026	B	Wall	Curved Wall	Concrete	Intact	0.9	QM	Negative
027	C	Wall	Top of Wall	Concrete	Intact	1.5	QM	Positive
028	C	Wall	Middle of Wall	Concrete	Intact	0.3	QM	Negative
029	C	Wall	Bottom of Wall	Concrete	Intact	4.4	QM	Positive
030		End of 11/10/2023	Calibration			1.0	TC	Pass
031			Calibration			1.0	TC	Pass
032			Calibration			1.0	TC	Pass

APPENDIX C

Certifications

AEROSOL MONITORING & ANALYSIS, INC.

This is to certify that

ANDREW CLARK

2620 HILLCREST AVE
BALTIMORE , MD 21234

has met the attendance requirements and successfully completed the course entitled

1-DAY LEAD INSPECTOR REFRESHER - VIRTUAL

This Training Meets the Certification Requirements for DC, MD & VA

01/07/2022	01/07/2022		STEVE SIERACKI	
Course Date	***Exam Date***		***Principal Instructor***	
1/7/2024	1/7/2025	1/7/2024		
MD Expiration Date	***VA Expiration Date***	***DC Expiration Date***		
V108746	VAV108746	V108746	E. Rush Barnett	
Certification No.	***VA Certification No.***	***DC Certification No.***	***Course Director***	

DC Lead Training Provider Accreditation No. DC21-001-I-R

1331 Ashton Road *P.O.Box 646* *Hanover, MD 21076* *P: 410-684-3327* *F: 410-684-3724*

www.amatraining.com

CONTRACT NO. RP 23888

THIS IS TO CERTIFY THAT

Andrew James Clark

HAS MET THE LEAD PAINT SERVICES ACCREDITATION REQUIREMENTS FOR

Inspector Technician

EXPIRATION DATE: 01/24/2024

TRAINING PROVIDER: Aerosol Monitoring & Analysis, Inc.

COURSE DATE: 01/07/2022

Certificate # 16814

ADMINISTRATOR, LEAD PAINT ACCREDITATION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

01/24/2022
Date

STATE OF MARYLAND

272

CONTRACT NO. RP 23888